

Knowledge of Mothers Regarding Management of Fever in their Children Under Five Years of Age in Al-Hilla City

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Abstract

Background: Improper fever definitions will lead to excessive treatment with its adverse consequences, or missed fever, or delayed diagnosis of dangerous illness. Mothers' care for a feverish child can sometimes be inappropriate and harmful. **Objective:** To assess knowledge of mothers regarding definition and management of fever in their children under five years of age and to identify the association between mothers' knowledge and mothers' socio demographic factors. **Materials and Methods:** A cross-sectional study was conducted among 302 mothers of alive children aged below five years. The mothers were interviewed (face-to-face) after giving their verbal consent to participate in this study by using a systematic questionnaire, which included mothers' socio-demographic characteristics and questions related to fever management. It was carried out at Babylon Teaching Hospital for Maternity and Children, Al Imam Al Sadiq Teaching Hospital, and Al Noor Hospital For Children in Al-Hilla City, Iraq, from February 1 to June 15, 2022. **Results:** The mean age of mothers was (27.07 ± 6.33) years, 16.56% of mothers were higher education graduates, 86.75% were housewives. 0.66% of mothers had insufficient knowledge regarding fever management, 65.23% had moderate knowledge, and 34.11% had high knowledge. The mothers' knowledge was in significant association with the mothers' educational level, mothers' occupation, using internet, and in significant negative correlation with number of alive children that the mothers had. **Conclusion:** About two-thirds of the mothers had moderate knowledge regarding fever management, about one-third had high knowledge, and less than one percent of mothers had insufficient knowledge.

Keywords: Children, fever, knowledge, management, mothers

INTRODUCTION

Fever in children is a common reason for parents to seek medical attention.^[1] It is a response characterized by an elevation of body temperature above normal daily variation.^[2] Fever is a rectal temperature $\geq 38^{\circ}\text{C}$.^[3] Improper fever definitions will lead to excessive treatment with its adverse consequences, or missed fever, or delayed diagnosis of dangerous illness.^[4] Viral infection is usually the cause of a febrile episode, but bacterial infections and other causes must be excluded.^[5]

Fever is presented when an increase in body temperature occurs through a modification of the hypothalamic temperature set-point in response to pyrogens; in contrast to hyperthermia which occurs when there is an increase in body temperature because of a failure of thermoregulation.^[2] This difference implies that hyperthermia may have severe consequences on the body.

Most cases of hyperthermia are due to massive heat exposure, such as in the case of children left in cars during hot season.^[6]

Over the past 35 years, the concept of fever-phobia has been used^[7] to describe parents' exaggerated fear of fever. Although numerous national^[8] and international guidelines on fever are available, these fears and some inappropriate practices persist.^[9,10] Parents are frequently concerned that untreated fever may lead to brain damage, seizures, and death.^[10,11] It is important to educate parents in order to evaluate the onset of signs and symptoms of a possible severe underlying condition and investigate

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children's discomfort rather than just focusing on their temperature.^[7]

Mothers may choose steroids, or combine antipyretics to decrease fever.^[12] Antibiotics are often inappropriately used, exposing children to adverse effects and an increased risk of antibiotic resistance,^[13] which is a threat to public health.^[14] Antipyretics have not been shown to prevent seizure attacks.^[15] In many parts of the world, paracetamol and ibuprofen are the most frequently purchased over-the-counter or prescribed medicines for children, but inappropriate use is common.^[16] They are considered safe when used appropriately, and adverse events are rare. The most serious adverse effects are hepatic injury for acetaminophen, and acute kidney injury and gastrointestinal bleeding for ibuprofen. Errors in medications dose or frequency of administration are often implicated. The use of adult preparations is especially dangerous. Adverse events may also occur at correct dosing, especially in the presence of risk factors, most commonly dehydration, or in the case of protracted therapies.^[17,18]

It is important to educate healthcare workers about fever, the distinction between hyperthermia and fever, thermometry, and safe evidence-based treatment strategies to be equipped to educate parents.^[19] Formal education by printed, visual, and verbal media, at community and at clinical settings, is effective in increasing parents' knowledge about fever and its management.^[20]

The study's aim

to assess the knowledge of mothers regarding definition and management of fever in their children bellow five years of age and to identify the association between mothers' knowledge and mothers' sociodemographic factors.

MATERIALS AND METHODS

It is a cross-sectional study, which was conducted among mothers of alive children bellow five years of age who attended pediatric outpatient clinics, emergency departments, and pediatric wards of Babylon Teaching Hospital for Maternity and Children, Al Imam Al Sadiq Hospital, and Al Noor Hospital For Children in Al-Hilla City, Iraq, from the first of February 2022 to fifteenth of June 2022. Inclusion criteria include mothers of alive children aged bellow five years who attended the above mentioned hospitals and accepted to participate in this study; Exclusion criteria include women who do not have alive children aged bellow five years.

Sampling

This study included a convenient sample of 302 mothers of alive children aged under five years who accepted to participate in this study. The sample size was calculated according to the following equation^[21]:

$$n = \frac{z^2 p(1-p)}{d^2}$$

Where n = sample size, z = 1.96, P = prevalence, and d = relative precision = 0.05.

The prevalence of fever in children under five years of age is 26.7%.^[22]

Fever and body temperature measurement

WHO defines fever in children as an axillary temperature of 37.5°C (38°C rectal) or above.^[23]

Body temperature measurement using an electronic thermometer in the axilla is recommended for children aged 0–5 years.^[8,24–26] The oral and rectal routes should not be routinely used to measure the temperature of children aged 0–5 years.^[24] Oral measurement requires the patient's cooperation and may be influenced by such factors as mucositis, intake of hot or cold food, temperature of inhaled air, and respiratory frequency. The rectal method entails a risk of rectal lesions or perforation, and a risk of bacterial cross-contamination has been reported in the absence of proper cleansing procedures. In addition, the potential discomfort for the child should be considered. Use of a mercury thermometer is not recommended for children aged 0–5 years because of the risk of breakage and metal toxicity.^[8,25]

Data collection

The data collection was done by using a systematic pretested questionnaire by which the mothers were interviewed (face to face). The questionnaire format consists of:

The first part was related to sociodemographic factors of the mothers including:

Age (in years); educational level (illiterate, able to read and write, primary school graduate, secondary school graduate, and higher education graduate); occupation (governmental employed, self-employed, housewife, student, and retired); number of alive children of mother; residence (rural and urban); monthly family income (less than 500'000 IQD, 500'000 to 1'000'000 IQD, and more than 1'000'000 IQD).

The second part included 12 pretested questions, which were multiple choices questions related to the mothers' knowledge regarding fever management in their children bellow five years of age.^[27] Each question of this part had multiple choices. Each mother was allowed to choose only one choice for each question of this part.

The correct answer received a score of 3, not sure answer received a score of 2, and an incorrect answer received a score of 1.^[27] Mean knowledge score of each mother was calculated by dividing the sum of the scores of all questions of mother by the total number of questions.

Then mean knowledge score of mother was classified into one of three categories:

- (1.00–1.66) indicates insufficient knowledge.
- (1.67–2.33) indicates moderate knowledge.
- (2.34–3.00) indicates high knowledge.

Then frequency and percentage of mothers who had insufficient knowledge, had moderate knowledge, and who had high knowledge was calculated.^[27]

The questions of this part and their correct choices (which are mentioned between brackets next to each question) include:

Which is the best place to take the temperature of a child under five years? (the correct choice is “axilla”)^[8,24-26]; What is the normal body temperature of a child? (the correct choice is “36°C” or “37°C”)^[3]; Above what temperature would you consider child have a fever? (the correct choice is “37.5°C”)^[23]; Above what temperature would you give child treatment? (the correct choice is “38.5°C”)^[23]; If a child has a fever, how high temperature you call the doctor or go to the hospital or consulting health care worker? (the correct choice is “38°C”)^[28]; What is the most common complication of high fever in children if don’t treat it? (the correct choice is “febrile seizure”)^[3]; Which method is the best way to measure unwell child temperature? (the correct choice is “electronic thermometer”)^[8,24,25]; Which best drug is giving to your unwell child for fever? (the correct choice is “acetaminophen”)^[17,24]; Which is the best instrument accurate to determine the right dose of paracetamol syrup? (the correct choice is “specific measures spoon / syringe of drugs”)^[5]; Mothers should give unwell child paracetamol rectally if (the correct choice is “unable to give him orally because of vomiting or child refusal”)^[8,29]; How do you decide the right fever lowering drugs to give to your child? (the correct choice is “according to label instructions or consulting health care worker”)^[26]; Cold sponge or ice pack is good for lowering body temperature in addition to drugs that reduce fever in children (the right choice is “incorrect”).^[8,24,25]

The questionnaire also included that the mother mentions her sources of information regarding fever management. The mother was allowed to freely mention one source of information or more than one (by her words without choices in the questionnaire).

Pilot study was carried out before starting the data collection for one week. It included 30 respondents, who were excluded from the study sample to assess their understanding of the questionnaire, the time needed for data collection, and any difficulties.

Data analysis

Statistical analysis was carried out using SPSS® Software (version 23.0 for Linux®) and R® Statistical Computing

Environment (version 3.6.3 for Linux®). Qualitative data are represented as numbers and percentages, while continuous numerical data are represented as mean $\pm$ standard deviation. Correlation between numerical variables was calculated using Pearson’s product-moment correlation coefficient (for continuous variables) and using Spearman’s Rho (for discrete variables). Relationship between categorical variables was calculated using chi-square test, and was replaced by Fisher’s exact test when there were more than (20%) of the cells with expected frequencies smaller than 5. Data were represented using appropriate tables and visualized using appropriate figures. P-value of ≤ 0.05 was considered statistically significant.

Ethical approval

The study was conducted in accordance with the ethical principles that have their origin in the Declaration of Helsinki. It was carried out with patients verbal and analytical approval before sample was taken. The study protocol and the subject information and consent form were reviewed and approved by a local ethics committee according to the document number 119 (including the number and the date in 15/02/2022) to get this approval.

The study protocol was reviewed and granted permission by the Ethical committee of Babylon University, College of Medicine. Official agreement was obtained from Babylon Health Directorate to carry out the study. After explaining the objectives of this study to the mothers, verbal consent was obtained from them prior to interviewing. The names of participants were replaced by identification codes to keep data confidential.

RESULTS

This study included a total of (302) mothers of children of bellow five years of age, age of participants ranged from (16 to 46) years with a mean age of (27.07 ± 6.33) years and a median of (26) years. Age groups distribution of study participants is illustrated in [Figure 1]. Socio-demographic characteristics of study participants are detailed in [Table 1].

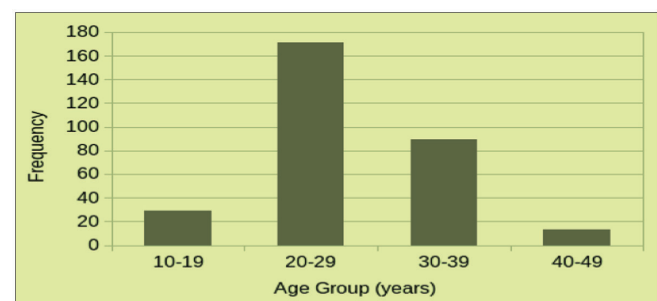


Figure 1: Age group distribution among study participants ($n = 302$)

Table 1: Socio-demographic characteristics of study participants (n = 302)

Socio-demographic characteristics		Frequency	Percentage (%)
Maternal educational Level	Illiterate	27	8.94%
	Able to read and write	65	21.52%
	Primary school graduate	99	32.78%
	Secondary school graduate	61	20.20%
	Higher education graduate	50	16.56%
Occupation of mother	Governmental employed	29	9.60%
	Self-employed	5	1.66%
	Housewife	262	86.75%
	Student	6	1.99%
Number of living children	1	73	24.17%
	2	72	23.84%
	3	56	18.54%
	4	54	17.88%
	5 or more	47	15.56%
Monthly family income	Less than 500'000 IQD	159	52.65%
	500'000 to 1'000'000 IQD	112	37.09%
	More than 1'000'000 IQD	31	10.26%
Residence	Rural	126	41.72%
	Urban	176	58.28%

Table 2: Knowledge score of study participants (n = 302)

Mean knowledge score	Frequency	Percentage (%)
Insufficient (1.00 – 1.66)	2	0.66%
Moderate (1.67 – 2.33)	197	65.23%
High (2.34 – 3.00)	103	34.11%

Regarding knowledge of mothers, participants had a mean knowledge score of (2.29 ± 0.22) with a median score of (2.33). 0.66% of the mothers had insufficient knowledge, 65.23% had moderate knowledge, and 34.11% had high knowledge. Details of knowledge score of study participants are provided in [Table 2]. Details of answers to questions are provided in [Table 3].

Pearson's product-moment correlation coefficient was calculated to assess the correlation between mean knowledge score and age of the mothers. No significant correlation was observed between the two variables, correlation coefficient (R) = -0.021, P -value = 0.714. Spearman's correlation coefficient was calculated to assess the correlation between number of alive children and mean knowledge score. There was significant negative correlation of small strength between the two variables, correlation coefficient (R) = -0.140, P -value = 0.015. Association between mean knowledge score and socio-demographic characteristics of study participants is detailed in [Table 4].

Source of the mothers' information about fever management is detailed in [Table 5]. Internet as a source of information was found to be significantly associated with higher proportion of mothers with high knowledge

score, with P -value of 0.034. All other sources had no significant association with knowledge score.

DISCUSSION

The current study showed that most of mothers had moderate knowledge in 65.23%, which was agree with other studies done in Iraq by Ameen,^[27] in Iran by Talebi *et al.*^[30] and in Jordan by Abu-Baker *et al.*^[31] and incompatible with the results of a study in Egypt by Waly and Bakry, which found that 46.8% of mothers had bad knowledge, 15.5% had moderate knowledge, and 37.7% had good knowledge.^[32] In the previous studies, the variability between their findings may be due to the differences in the cultural backgrounds and educational levels.

In our study, 77.8% of mothers they know the normal body temperature of a child; 90.8% in another study by Abu-Baker *et al.*^[31] Concerning "Above what temperature would you consider child have a fever?", only 47.7% of mothers in the current study correctly answered "37.5°C", while 12.3% answered "36.5°C". Another study by Ameen showed that 33% of the mothers correctly answered.^[27] Another study by Arica *et al.* showed that 5% of mothers considered 36°C as fever, and 14% considered 37°C as fever.^[33]

Concerning "Above what temperature would you give child treatment?", only 10.3% of mothers answered 38.5°C, 40.7% answered 37.5°C, 3.6% answered $\geq 39.5^\circ\text{C}$, and 45.4% answered "not sure". These results not agree with results of another study done by Zyoud *et al.* in Palestine, which showed that 38.6% of parents correctly answered, 38.1% gave children antipyretics at a temperature less than 38.5°C.^[34]

Table 3: Answers to knowledge questions 1–12 by study participants (*n* = 302)

Question	Frequency	Percentage
1-Which is the best place to take the temperature of a child under five years?		
Rectal	1	0.3%
Mouth	9	3.0%
Axilla	281	93.1%
Not sure	11	3.6%
2-What is the normal body temperature of a child?		
36°C	146	48.3%
37°C	89	29.5%
38°C	2	0.7%
≥ 39°C	0	0.0%
Not sure	65	21.5%
3-Above what temperature would you consider child have a fever?		
36.5°C	37	12.3%
37.5°C	144	47.7%
38.5°C	25	8.3%
≥ 39.5°C	5	1.7%
Not sure	91	30.1%
4-Above what temperature would you give child treatment?		
37.5°C	123	40.7%
38.5°C	31	10.3%
≥ 39.5°C	11	3.6%
Not sure	137	45.4%
5-If a child has a fever, how high temperature you call the doctor or go to the hospital or consulting health care worker?		
37.5°C	35	11.6%
38°C	67	22.2%
39.5°C	36	11.9%
≥40°C	7	2.3%
Not sure	157	52.0%
6-What is the most common complication of high fever in children if don't treat it?		
Febrile seizure	260	86.1%
Death	2	0.7%
Brain damage	4	1.3%
Coma	3	1.0%
Nothing will happen	8	2.6%
Not sure	25	8.3%
7-Which method is the best way to measure unwell child temperature?		
Your hand	80	26.5%
Glass thermometer	37	12.3%
Electronic thermometer	155	51.3%
Not sure	30	9.9%
8-Which best drug is giving to your unwell child for fever?		
Acetaminophen	178	58.9%
Aspirin	0	0.0%
Ibuprofen (Prufen)	12	4.0%
Antibiotic	42	13.9%
Not sure	70	23.2%
9-Which is the best instrument accurate to determine the right dose of paracetamol syrup?		
Tablespoon	8	2.6%
Teaspoon	29	9.6%
Specific measures spoon / Syringe of drugs	261	86.4%
Not sure	4	1.3%
10-Mothers should give unwell child paracetamol rectally if:		
She wants more useful	161	53.3%
She wants to become a more practical	28	9.3%

Table 3: Continued

Question	Frequency	Percentage
Unable to give him orally because of vomiting or child refusal	53	17.5%
Not sure	60	19.9%
11-How do you decide the right fever lowering drugs to give to your child?		
According to label instructions or consulting health care worker	246	81.5%
According to information gathered previously	33	10.9%
I decided by myself what I think is right	10	3.3%
Not sure	13	4.3%
12-Cold sponge or Ice pack is good for lowering body temperature in addition to drugs that reduce fever in children:		
Correct	181	59.9%
Incorrect	65	21.5%
Not sure	56	18.5%

Table 4: Association between mean knowledge score and socio-demographic characteristics of study participants

Socio-demographic characteristics		Mean knowledge score			Total	P-value
		Insufficient	Moderate	High		
Level of maternal education	Illiterate	-	24 (88.9%)	3 (11.1%)	27 (100%)	< 0.001 ^F
	Able to read and write	-	48 (73.8%)	17 (26.2%)	65 (100%)	
	Primary school graduate	-	72 (72.7%)	27 (27.3%)	99 (100%)	
	Secondary school graduate	1 (1.6%)	31 (50.8%)	29 (47.5%)	61 (100%)	
	Higher education graduate	1 (2.0%)	22 (44.0%)	27 (54.0%)	50 (100%)	
Occupation of mother	Governmental employed	1 (3.4%)	11 (37.9%)	17 (58.6%)	29 (100%)	0.019 ^F
	Self-employed	-	2 (40.0%)	3 (60.0%)	5 (100%)	
	Housewife	1 (0.4%)	182 (69.5%)	79 (30.2%)	262 (100%)	
	Student	-	2 (33.3%)	4 (66.7%)	6 (100%)	
Monthly family income	< 500'000 IQD	1 (0.6%)	111 (69.8%)	47 (29.6%)	159 (100%)	0.313 ^F
	500'000 – 1'000'000 IQD	1 (0.9%)	69 (61.6%)	42 (37.5%)	112 (100%)	
	> 1'000'000 IQD	-	17 (54.8%)	14 (45.2%)	31 (100%)	
Residence	Rural	1 (0.8%)	84 (66.7%)	41 (32.5%)	126 (100%)	0.859 ^F
	Urban	1 (0.6%)	113 (64.2%)	62 (35.2%)	176 (100%)	

* Significant at $P \leq 0.05$, ^F Calculated using Fisher's exact test

Table 5: Source of information for mothers (n = 302)*

Source of Information	Frequency	Percentage (%)
Healthcare workers	219	72.5%
Relatives	158	52.3%
Internet	71	23.5%
Personal experience	46	15.2%
Television	29	9.6%
Books	14	4.6%

* More than one response per participant

22.2% of mothers correctly answered regarding what is severity of temperature to call the doctor, and this was similar to other study done in Iraq by Ameen, 24%.^[27] 86.1% of mothers reported that febrile seizure is the most common complication of high fever in children if don't treat it, which was similar to another study by Ameen in which seizure was reported by 87%.^[27] In another study by Zyoud *et al.*, brain damage was reported by 38.1%.^[34]

The best method to measure the temperature in the current study was electronic thermometer in 51.3%, which agree with other study done in Saudi Arabia by Al Arifi and Alwhaibi showing 62.3%,^[35] while other study done in Kurdistan of Iraq by Ameen showed the hand is best method in 76%.^[27] These differences may be due to the presence or absence of poverty and educational levels among participants.

The best treatment was given to unwell child for fever was acetaminophen in 58.9% which was similar to other studies done in Nigeria by Alex-Hart and Frank-Briggs^[36] and in Saudi Arabia by Al Arifi and Alwhaibi.^[35] Concerning “Mothers should give unwell child paracetamol rectally if” only 17.5% correctly answered, which is similar to other study done in Iraq by Ameen, 25%.^[27] Regarding “cold sponge or ice pack is good for lowering body temperature in addition to drugs that reduce fever in children” only 21.5% of mothers had right answers, similar to other study done in Iraq by Ameen, 29% had right answers.^[27]

Another study done by Al Arifi and Alwhaibi showed that cold sponging was used by 78.4% for fever management.^[35]

There was a significant association between the mothers' educational level and their knowledge regarding fever management, with P-value <0.001. That is similar to the results of other studies in Iraq by Ameen,^[27] in Egypt by Waly and Bakry,^[32] and in Turkey by Arica *et al.*^[33] This can be explained by the fact that mothers with a higher educational level can read and understand health information and instructions better than mothers with a lower educational level.

In our study, occupation of the mother also had a significant association with the mothers' knowledge, with P-value of 0.019. Housewives had the lowest proportion of mothers with high knowledge score in a comparison with working mothers had higher knowledge level. This result was consistent with several studies conducted in Egypt,^[32] Saudi Arabia,^[37] India,^[38] and Iraq.^[39-40] This may be due to the fact that most of the employed mothers have high education levels, which associated with higher knowledge level about fever management.

In the present study, there was a significant negative correlation between the number of alive children and the knowledge of the mothers. Mothers who had lesser number of children had a higher knowledge level. This is similar to other studies in Egypt by Waly and Bakry^[32] and in Turkey by Arica *et al.*^[33] This could be explained by the fact that mothers who have lesser number of children tend to have more interest in seeking information about childhood health and fever in children from reliable sources and providing special care for their febrile children under five years of age.

There was no significant correlation observed between the mothers' age and their knowledge. That is similar to another study in Iraq by Ameen.^[27] Also, there was no significant association observed between the monthly income of the family and mothers' residence with their knowledge, similar to other study in Jordan by Abu-Baker *et al.*^[31] The commonest source of information of fever management was 72.5% from healthcare workers, followed by relatives in 52.3%; 23.5% from the internet; 15.2% from personal experience; 9.6% from television; and 4.6% from books, which is consistent with a study done in Turkey by Arica *et al.*^[33]

According to the findings, it is recommended to develop coordinated and continuous educational programs about all issues related to fever and its management in children at home using verbal and visual media, at community level, and at the clinical setting, to target mothers to be fully informed. Similar population-based studies are advised to achieve the generalization of results and to assess other factors that may be related to the domestic management of childhood fever

CONCLUSIONS

About two thirds of the mothers had moderate knowledge regarding fever management in their children, one third of the mothers had high knowledge, and less than one percent of the mothers had insufficient knowledge. The mothers' knowledge regarding fever management was in significant association with the mothers' educational level, mothers' occupation, using the internet, and in significant negative correlation with the number of alive children that the mothers had. There was no significant relation between the knowledge of the mothers regarding fever management and the monthly income of the family, residence of the mothers, or the mothers' age.

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Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Lee HN, Kwak YH, Jung JY, Lee SU, Park JW, Kim DK. Are parents' statements reliable for diagnosis of serious bacterial infection among children with fever without an apparent source?: A retrospective study. *Medicine (Baltimore)* 2019;98:e17530.
2. Barbi E, Marzuillo P, Neri E, Naviglio S, Krauss BS. Fever in Children: Pearls and Pitfalls. *Child* 2017;4:81.
3. Kliegman RM, Geme JWS, Blum NJ, Shah SS, Tasker RC, Wilson KM, *et al.* 'Nelson Textbook of Pediatrics', Fever. Philadelphia: Elsevier Inc; 2020. p. 5642-50.
4. Zhen C, Xia Z, Ya Jun Z, Long L, Jian S, Gui Ju C, *et al.* Accuracy of infrared tympanic thermometry used in the diagnosis of fever in children: A systematic review and meta-analysis. *Clin Pediatr (Phila)* 2015;54:114-26.
5. Green R, Webb D, Jeena PM, Wells M, Butt N, Hangoma JM, *et al.* Management of acute fever in children: Consensus recommendations for community and primary healthcare providers in sub-saharan africa. *Afr J Emerg Med* 2021;11:283-96.
6. Ferrara P, Vena F, Caporale O, Del Volgo V, Liberatore P, Ianniello F, *et al.* Children left unattended in parked vehicles: A focus on recent italian cases and a review of literature. *Ital J Pediatr* 2013;39:71.
7. Chiappini E, D'Elis S, Mazzantini R, Becherucci P, Pierattelli M, Galli L, *et al.* Adherence among italian paediatricians to the italian guidelines for the management of fever in children: A cross sectional survey. *Bmc Pediatr* 2013;13:210.
8. Chiappini E, Venturini E, Remaschi G, Principi N, Longhi R, Tovo PA, *et al.*; Italian Pediatric Society Panel for the Management of Fever in Children. 2016 update of the italian pediatric society guidelines for management of fever in children. *J Pediatr* 2017;180:177-83.e1.
9. Paul SP, Kini PK, Tibrewal SR, Heaton PA. Nice guideline review: Fever in under 5s: Assessment and initial management (Ng143). *Arch Dis Child Educ Pract Ed* 2022;107:212-6.
10. Purssell E, Collin J. Fever phobia: The impact of time and mortality—a systematic review and meta-analysis. *Int J Nurs Stud* 2016;56:81-9.
11. Shibeef NF, Altufaily YAS. Parental knowledge and practice regarding febrile seizure in their children. *Med J Babylon* 2019;16:58. https://doi.org/10.4103/MJBL.MJBL_89_18.
12. Clericetti CM, Milani GP, Bianchetti MG, Simonetti GD, Fossali EF, Balestra AM, *et al.* Systematic review finds that fever phobia is a worldwide issue among caregivers and healthcare providers. *Acta Paediatr* 2019;108:1393-7.

13. Rogawski ET, Platts-Mills JA, Seidman JC, John S, Mahfuz M, Ulak M, *et al.* Use of antibiotics in children younger than two years in eight countries: A prospective cohort study. *Bull World Health Organ* 2017;95:49-61.
14. Jasim RAF. Strategies for challenging development in antimicrobial resistance. *Med J Babylon* 2021;18:172. https://doi.org/10.4103/MJBL.MJBL_35_21.
15. Strengell T, Uhari M, Tarkka R, Uusimaa J, Alen R, Lautala P, *et al.* Antipyretic agents for preventing recurrences of febrile seizures: Randomized controlled trial. *Arch Pediatr Adolesc Med* 2009;163:799-804.
16. Bárcaga Arencibia Z, Choonara I. Balancing the risks and benefits of the use of over-the-counter pain medications in children. *Drug Saf* 2012;35:1119-25.
17. Kanabar DJ. A clinical and safety review of paracetamol and ibuprofen in children. *Inflammopharmacology* 2017;25:1-9. <https://doi.org/10.1007/S10787-016-0302-3/FIGURES/1>.
18. Rajanayagam J, Bishop JR, Lewindon PJ, Evans HM. Paracetamol-associated acute liver failure in Australian and New Zealand children: High rate of medication errors. *Arch Dis Child* 2015;100:77-80.
19. Zomorodi A, Attia MW. Fever: Parental concerns. *Clin Pediatr Emerg Med* 2008;9:238-43.
20. Young M, Watts R, Wilson S. The effectiveness of educational strategies in improving parental/caregiver management of fever in their child: A systematic review. *Jbi Libr Syst Rev* 2010;8:826-68.
21. Charan J, Biswas T. How to calculate sample size for different study designs in medical research? *Indian J Psychol Med* 2013;35:121-6.
22. Prasad N, Sharples KJ, Murdoch DR, Crump JA. Community prevalence of fever and relationship with malaria among infants and children in low-resource areas. *Am J Trop Med Hyg* 2015;93:178-80.
23. World Health Organisation. *Integr Manag Child Illness Modul 5 Fever* WHO Press Geneva 2014. https://apps.who.int/iris/bitstream/handle/10665/104772/9789241506823_Module-5_eng.pdf;jsessionid=1348F4D8E65CFFE9CD02AACCA6FF1050?sequence=7 [Last accessed on 20 Feb 2020].
24. National Institute for Health and Care Excellence. *Fever under 5s Assess Initial Manag NICE Guidel [NG143]* 2021. <https://www.nice.org.uk/guidance/ng143>. [Last accessed on 16 Feb 2022].
25. Chiappini E, Principi N, Longhi R, Tovo PA, Becherucci P, Bonsignori F, *et al.*; Writing Committee of the Italian Pediatric Society Panel for the Management of Fever in Children. Management of fever in children: Summary of the Italian pediatric society guidelines. *Clin Ther* 2009;31:1826-43.
26. Green R, Jeena P, Kotze S, Lewis H, Webb D, Wells M; Department of Paediatrics and Child Health, University of Pretoria, South Africa; Department of Paediatrics and Child Health, University of KwaZulu-Natal, Durban, South Africa. Management of acute fever in children: Guideline for community healthcare providers and pharmacists. *S Afr Med J* 2013;103:948-54.
27. Ameen BB. Scope of Mothers' Knowledge Regarding Child Fever Management in Ranya city/Kurdistan Regional Government of Iraq. *Erbil J Nurs Midwifery* 2020;3:157-65. <https://doi.org/10.15218/EJNM.2020.18>.
28. INMO. Continuing Education Module 19: Child Health. Use of Antipyretics in Children 2012. https://www.inmo.ie/tempDocs/Child%20health_PAGE43-44dec12-jan13.pdf. [Last accessed on 15 Feb 2022].
29. Ziesenitz VC, Zutter A, Erb TO, van den Anker JN. Efficacy and safety of ibuprofen in infants aged between 3 and 6 months. *Paediatr Drugs* 2017;19:277-90.
30. Talebi S, Shahrabadi H, Sabzevar A, Talebi S, Siyavoshi M. Mothers' management of fever of children in Sabzevar. *J Nurs Midwifery Sci* 2016;3:32.
31. Abu-Baker NN, Gharaibeh HF, Al-Zoubi HM, Savage C, Gharaibeh MK. Mothers' knowledge and practices of managing minor illnesses of children under five years. *J Res Nurs* 2012;18:651-66.
32. Waly EH, Bakry HM. Assessment of Egyptian Mothers' Knowledge and Domestic Management Practices of Fever in Preschool Children in Zagazig City, Sharkia Governorate. *Child* 2022;9:349. <https://doi.org/10.3390/CHILDREN9030349>.
33. Arica SG, Arica V, Onur H, Gülbayzar S, Dağ H, Obut Ö. Knowledge, attitude and response of mothers about fever in their children. *Emerg Med J* 2012;29:e4.
34. Zyoud SH, Al-Jabi SW, Sweileh WM, Nabulsi MM, Tubaila MF, Awang R, *et al.* Beliefs and practices regarding childhood fever among parents: A cross-sectional study from Palestine. *Bmc Pediatr* 2013;13:66.
35. Al Arifi MN, Alwhaibi A. Assessment of Saudi Parents' Beliefs and Behaviors towards Management of Child Fever in Saudi Arabia—A Cross-Sectional Study. *Int J Environ Res Public Heal* 2021;18:5217.
36. Alex-Hart B, Frank-Briggs A. Mothers' Perception of Fever Management in Children. *Niger Heal J* 2011;11:69-72.
37. Hussain SM, Al-Wutayd O, Aldosary AH, Al-Nafeesah A, Al-E'd A, Alyahya MS, *et al.* Knowledge, attitude, and practice in management of childhood fever among Saudi parents. *Glob Pediatr Health* 2020;7:2333794X20931613.
38. Kumar R, Kaushik NK, Vaishnav J, Krishnan V, Pareek S. Knowledge of mothers toward growth and development of their under-5 years children in Western Rajasthan (India). *Med J Babylon* 2022;19:453-8.
39. Al-Zubaidi OH, Al-Salman AR. Assessment of parents' awareness about urinary tract infections in children of Babylon Province. *Med J Babylon* 2022;19:50-7.
40. Nsaif AK, Al-Joborae SFF. Medical and social analysis of preschool children under the age of six years at secondary and tertiary care after home accidents in Hilla City. *Med J Babylon* 2022;19:169-75.