Parent’s knowledge and practice in home management of fever in their children in Riyadh, Saudi Arabia

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Background: Fever in children is a common presenting complaint during health visits. Parents frequently have concerns about fever and perceive it as a disease rather than a symptom of illness. Parent’s practice of home managing of fever varies according to their background and experience. Objective: To explore parents’ perception and practice in home management of fever in their preschool children in Riyadh, Saudi Arabia (SA). Materials and Methods: This is a cross-sectional study. Data were collected from 250 parents attending three main family medicine centers at King Abdul-Aziz Medical City, Riyadh, SA, using self-administered questionnaire. Results: Most of the parents (64%) defined fever correctly and 56% identified high fever. Almost all the parents (95%) believed fever is harmful, and febrile convulsion was the most concerned complication of fever (74%), followed by loss of consciousness, dehydration, brain damage, and hearing loss. Most of the parents (82%) touch their children to confirm fever, 68% use oral thermometer, and 63% use axillary thermometer. Most parents (84%) applied cold compression, 75% gave their children nonprescribed fever medication, 61% gave their children plenty of fluids, and 64% took their children to the doctor right away. Almost one-third of participants reported having difficulty either in choosing fever medicine or giving the proper dose and frequency. No difference in knowledge or practice was found in relation to difference in demographic characteristics of participants. Conclusion: Results of this study indicate poor knowledge and practice in regard to parent’s management of febrile children, overuse of nonprescribed fever medication, and possible waste of health resources.

Abstract

Introduction

Fever, one of the most common presenting complaints, is being the reason for health visits in about 70% of pediatric age group.[1] Parents frequently perceive fever as a disease rather than a symptom or sign of illness.[2] and are usually concerned when they have a febrile child and often find it difficult in assessing the severity of the illness.[3] In 1980, Dr. Barton Schmitt defined the term “fever phobia” to describe parents’ fearful view of fever.[4] Inadequate parents’ knowledge about the cause of fever and misconceptions about its effects on their children’s health frequently lead to excessive psychological concerns such as anxiety and fear.[5] Studies found that parents are not correctly informed or well educated about the definition, measurement, and diagnosis of fever.[6,7]

A study done in 1997 explored 707 British mothers’ perceptions and attitudes toward fever and its treatment, and almost 59% of mothers reported they had been concerned during the febrile episode and 17% reported that they had been very worried.[8] Another study done in Denmark ended up with similar findings, where the parents found to have misunderstanding about fever and worried about temperatures that were considered normal.[9]

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Moreover, a study done in Australia found that only 1.4% out of 401 parents correctly evaluated and treated fever, and 64.6% were giving the wrong dosages of antipyretics.\cite{10}

Further studies show that educational level, socioeconomic status, and cultural background are the main contributing factors to the parents’ knowledge and judgment of childhood fever.\cite{11,12,13} In a study done in Morocco, 264 parents were interviewed regarding their knowledge about fever and how they manage their febrile children and showed that only 3.5% of the participants knew the correct definition for fever.\cite{11}

In Saudi Arabia a study about parental perception of fever in children found that more than 70% of parents demonstrated a poor understanding of the definition of fever, high fever, maximum temperature of untreated fever, and threshold temperature warranting antipyretics.\cite{14}

To the authors’ knowledge, there is no published paper on Saudi parents practice in home management of fever in their children. This study aimed to explore parents’ perception and practice in home management of fever in their preschool children in Riyadh, SA.

### Materials and Methods

This is a cross-sectional study done on parents attending primary health care clinics at King Abdulaziz Medical City in Riyadh, SA conducted during the period from October 1 to December 31, 2015. Visitors of three main Family Medicine and Primary Health Care centers at King Abdulaziz Medical City, Riyadh, covering different areas and population have been targeted: Health Care Specialty Clinic (HCSC) serves a population of around 350,000 people, King Abdul-Aziz Housing Clinics (Iskan) is for officers and soldiers housing and serves a population of around 50,000 people, and National Guard Comprehensive Specialized Clinic (NGSC) which serves around 180,000 population. Each center has a walk-in and booking system visit encountering for acute and chronic medical conditions.

All parents of preschool children who agreed to participate in the study and could complete the study questionnaire were included. Sample size was estimated to be 246 based on 100,000 population, 95% confidence level, assuming a 20% of response for the awareness level\cite{15,16} and with a ±5% margin of error. Sample size was increased to 250 to compensate for incomplete questionnaires. Sampling technique used was convenience nonrandom method. The data had been collected by the study investigators.

The study questionnaire was developed after literature review of similar studies\cite{15,16} to meet study-specific objectives and pretested in a pilot study on a sample of finalized 10 participants. The questionnaire of the pilot study was not included in the analysis. The questionnaire has three sections: The first section covered demographic information of both parents, including age, current occupation, mother and father education, number of children and their ages, monthly income, and if there was any history of febrile convulsion in the family. The second section was about the parents’ knowledge of fever, including definition of normal temperature and high temperature, fever health effects, and source of information about fever. The third section was about the parents’ practice in management of their febrile child: how they measure the temperature, what fever treatment given without prescription, when they decide to visit the health providers, and what difficulty they encounter when giving medication.

Fever was defined as a documented oral, ear, and forehead temperature above 37.8°C or higher per rectum (or “rectal equivalent”). A rectal equivalent temperature was calculated by adding 0.2°C to the oral temperature and subtracting 0.6°C to the axillary temperature.\cite{17}

Data were coded and entered using Statistical Package for the Social Sciences (SPSS) software, version 23. Descriptive statistics were performed in the form of frequencies and percentage for categorical variables, whereas mean and standard deviation (SD) were used for description of continuous variables. Analytic statistics were done using Chi-square test ($\chi^2$) to assess differences between categorical variables. Means were compared using independent Student’s $t$-test (analysis of variance when applicable). Statistical significance is set to 0.05 or less.

Approval of the research was obtained from King Abdullah International Medical Research Center (KAIMRC). Verbal consent was obtained from the participants when questionnaires were distributed. All data were kept confidential and were used only for research purposes.

### Results

A total of 250 parents were interviewed. A description of the demographic characteristics of the study parents is presented in Table 1. Most of the participants in the study were males (72.6%). One-hundred-forty parents (56%) were above 35 years old. A wide range in educational level, employment, family size, monthly income was noted. Most parents participating in the study were employed (73.4%), with 62.9% of them having a monthly income over 9000 Saudi Riyal. The educational level in the fathers was higher than in the mothers (53.2:41.1% in university education). Most parents participating in the study (90.4%) have no child with disability or chronic disease and 91.6% have no history of febrile convulsion in their children.

Parental knowledge about fever is presented in Tables 2 and 3. Most of the parents (54%) identified normal temperature and 64% defined fever correctly. Fifty-six percent identified high fever, whereas 47% could not. Almost all the parents (95%) believed fever is harmful to their children. Forty-five percent of the parents thought they have enough information about fever, 31% do not, and 23% were not sure. In regard to fever complications, febrile convulsion was considered by 74% of
parents, loss of consciousness and dehydration by 40%, brain damage by 32%, hearing loss by 27%, and organ damage by 13%.

Thirty-nine percent of the parents obtain their information of diagnosis and management of fever from pediatricians, 39% from relatives or friends, 36% from internet, 27% from reading the package leaflet of medical martials, 21% from family doctors, 18% from television, and 10% from other sources [Table 4].

Data concerning parental practice in their febrile children are shown in Table 5. Most of the parents (82%) measured their children forehead temperature by their hands, 68% use oral thermometer, 63% use axillary thermometer, almost quarter use rectal thermometer, and 60% took their children to the healthcare center and emergency department to measure their temperature. There is a variation in practice of fever management at home among the parents. Most parents (84%) applied cold compression, 75% gave their children nonprescribed fever medication, 61% gave their children plenty of fluids, 46% consulted their relatives and friends, and 64% took their children to the doctor right away.
When we asked the parents: “What make you decide to take your child to the healthcare center or emergency department?” 38% will do so if the child is febrile regardless of the temperature level, 75% if their child has high fever, 70% if their child does not respond to nonprescribed fever medication, 64% if their child does not improve within 24 hours, 54% if there was no clear reason of the fever-like cold, diarrhea, and teething, and 60% if their child has other symptoms such as runny nose, cough, diarrhea, and ear pain, or if the child is younger than 3 years.

Table 6 shows the difficulties parents have in giving fever medication to their kids. When choosing a fever medication generic/brand, 31% have difficulty, 41% do not, and 27% were not sure. Regarding deciding the correct dose, 34% have difficulty, 38% do not, and 28% were not sure. Regarding deciding the correct frequency of fever medication, 27% have difficulty, 42% do not have, and 30% were not sure.

No difference in knowledge or practice was found in relation to difference in demographic characteristics of participants.

**Discussion**

The aim of this study was to explore parent's knowledge of fever and their practices in managing their preschool children for fever at home. Participants were surveyed while sitting in the waiting area during their visit to the center for different health needs, with or without a febrile child. This we think may give more realistic answers based on the participants knowledge and experience and not affected by a stress of a febrile child.

In this study, 70.6% of the participants were male, in contrast to another study done by Al-Eissa et al., where 70% of participants were female. Mothers are usually the care giver of sick child, and this makes them more informative about practice of fever management at home.

Difficulty in identifying normal temperature is a common problem not only in our study, where 46% of participants could not identify fever, but also in other studies like the one done in Morocco, where only 3.5% of parents knew the correct definition of fever.[13] However, knowledgeable parents in this study, in regard to fever definition, were more compared to the other local study done by Al-Eissa et al., where >70% of parents have a poor understanding of the definition of fever and high fever.[13] The difference in results may be contributed to the difference in percentages of participant's gender in both studies. Similarly, international studies done earlier reported poor knowledge of parents about normal and high temperature.[8,11]

In reviewing more recent studies, parents found to have better level of knowledge regarding fever, and most parents described normal and febrile temperature.[14,16,18] The reason for this, possibly, is due to increasing health education activities of public, especially parents for their kids health.

Interestingly, 95% of participants in our study believed that fever is harmful to their children, 74% considered febrile convulsion is the most common consequence of fever, followed by loss of consciousness and dehydration (40.1%), brain damage (32%), hearing loss (27%), and finally, organ damage (13%).

Compared to international study, according to Walsh et al., many parents believed that fever is harmful and were very worried about that perceived harm, despite numerous reports of the
Table 6: What is the most common difficulty you have in giving fever medicine?

| Difficulty                                | Yes | No  | Not sure |
|-------------------------------------------|-----|-----|----------|
| Choosing the medicine (generic/brand)     | 78  | 21  | 4        |
| Deciding the correct dose                 | 85  | 15  |          |
| Deciding how frequent the medicine should be given | 68  | 32  |          |

scientific findings about the benefits of mild to moderate fever. Although parents rating of harmful effects of fever have changed from 1980 to 2004, their main concerns continue to be brain damage, febrile convulsions, and death.\[12\]

In 1980, parents were more concerned about brain damage because of fever (38–46%), which is similar to our finding (32%). Concern of febrile convulsions was reported earlier by 15–39% of parents but reported more recently with dramatic increase from 32 to 70%. This is confirmed also in our study where 74% of parents considered febrile convulsion as a major concern of fever complication. In a study of Kelly et al.,\[16\] parents had a variety of worries and concerns when their child had a fever and mainly related on complications, such as meningitis and convulsions. Similar results were found in Moroccan study, where 96.8% parents considered fever very serious condition compared to 95% in our study. Their main concern was brain damage (28.9%), seizure (18.8%), paralysis (19.5%), dyspnea (14.8%), and coma (14.8%).\[17\]

The low level of knowledge about fever and unrealistic concerns about fever complication among parents reported in our study, and other local and international studies, indicate clearly the need for more educational and awareness activities for the community. Educational and awareness programs need to be established to help parents in management of fever in their children, and this can be conducted at both community level and at the hospital and health centers, during the routine visit to the well-baby clinic or other general clinics. This sort of intervention has been proved effective by different studies.\[18\]

In our study, parents ranked pediatricians, relatives/friends, and internet almost at the same rank as the primary source of information about fever. This is showing the importance of the local community as an important source of medical information. Family physicians were ranked low by our participants as a source of information, and this is expected because most parents in Saudi Arabia will go to see the pediatrician for their sick child in the private sector instead of going to the primary care physicians in the governmental health centers. Similar result was found in India, where parents reported learning from relatives more than doctors.\[19\] In comparison, a study by Crocetti,\[20\] done in Baltimore, USA, reported that 46% of caregivers listed doctors as their primary source for information about fever, and similar result was found also in Canada and Italy, where the prime source of information was the doctor, followed by family, nurses, books, magazines, internet, and TV.\[21\] Certainly, there is a knowledge gap recognized by parents in regard to fever management, but unfortunately, the gap is filled with information from nonprofessional resources, which may result eventually in poor knowledge and practice. This requires that health professional take the lead and be involved more in community education.

Eighty-two percent of our participants measures temperature in their children by touching forehead and 68% use thermometer, mainly oral, and <25% use rectal thermometer. In India, a study published by Agrawal et al.\[13\] found that 85.3% of parents perceived fever as hotness of the whole body and only 14.6% use the thermometer, which is far less than that of our finding. In a local study, Al-Eissa et al.\[18\] found that most parents believed that they could tell whether their child has fever by the appearance or touching the child, and only 24% of parents had their child’s temperature measured at home.

In Walsh\[21\] study, it was found that only 38–44% of parents have a thermometer at home and few of them (30–46%) could accurately take or read temperature, whereas in Moroccan study,\[15\] 54.4% determined their children has fever using a thermometer and the preferred site was rectal. Similarly, the findings of Parmar\[14\] indicated that only 15% of parents had a thermometer at home and only 20% of participants know the normal body temperature. In another research conducted by Mohammadi et al.,\[20\] most parents were unable to use the thermometer correctly.

Furthermore, in a newly published study by Talebi et al.,\[16\] 67.4% of the mothers reported measuring the body temperature by touching the hand of the child, while 24.8% of them used a thermometer. In a more recent published article in Turkey by Yavuz et al.,\[22\] 45.8% of parents measure fever with a thermometer prior and only 38% of them used the thermometer correctly.

These reports show how common is the primitive way of fever measurement by parents, which is a subjective way and may result in inaccurate information given during medical consultation, while thermometers, the simple and easy-to-use tools, with objective results are available for home use.

Sixty percent (60%) of our participants go to healthcare centers and emergency to measure their child’s temperature, which is considered improper utilization of resources and needs effort from health institutes and healthcare workers for more health education.

With regard to management of their children with fever, 84% of participants in this study reported applying cold compressions, 75% giving nonprescribed fever medication, 46% consulting their relative and friends, and 64% taking their children to the doctor right away. In comparison to the other local study by Al-Eissa et al.,\[18\] 36% of parents will bath or sponge their child if the
The high percentage of parents in our study who use nonprescribed antipyretic medication for their febrile children (75%) may be worrisome, because it may indicate leniency to give unnecessary mediation even for mild fever. Moreover, almost one-third of participants reported having difficulty with antipyretic medication whether in regard to choosing the medicine, giving the proper dose, or frequency. This necessitates educational intervention by health professionals for parents in particular, and for community in general, to ensure the safety of medication use for children.

Conclusion

The results of this study indicate poor knowledge and practice in regard to parent’s management of febrile children, overuse of nonprescribed fever medication, and possible waste of health resources.

Recommendations

Based on the information founded in our study and by literature review of other studies, it is recommended that parents receive health education, at community level and at the clinical setting, about fever management in children, to improve their knowledge and practice regarding fever assessment, proper fever medication use, and when to seek medical advice.

Limitation

This study has some limitations. First, majority of participants were fathers, which may make the reported practice not very accurate because mothers are the usual care givers of sick children at home. Second, results may not be generalized because the study was done in military-dependents community and they may be different in their background and practice. Recall bias cannot be excluded because the data depend on self-report.

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Conflicts of interest
There are no conflicts of interest.

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