

Knowledge and Concerns of Parents Regarding Childhood Fever at a Public Health Clinic in Kuching, East Malaysia

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Abstract

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BACKGROUND: Parental anxiety regarding fever may be unwarranted as most cases are owing to self-limiting causes.

AIM: To assess the level of knowledge and concerns regarding childhood fever among parents with young children in a public health clinic in Kuching, East Malaysia.

METHODS: This cross-sectional study was conducted among parents recruited from a maternal and child health clinic, with children aged 6 months to 6 years. The participants completed a self-administered questionnaire regarding their knowledge and concerns about childhood fever. Descriptive statistical analyses were performed, and associations between dependent and independent variables were determined.

RESULTS: Only 26.1% of participants were found to have good knowledge. Knowledge regarding childhood fever was significantly associated with parent's ethnicity, education level, and household income. About 72% of parents were always worried about their child's illness. Three major reasons for their concerns were persistently rising temperature; discomfort caused by the fever, and feared complications of fever.

CONCLUSION: Excessive parental anxiety due to poor knowledge and misconceptions about fever may lead to poor quality of life and inappropriate management of fever. Healthcare providers may help by educating parents about fever and serious signs that indicate the need to seek healthcare advice.

Introduction

Children, particularly of preschool age, commonly present to primary health care clinics with fever. However, fever in children at the primary care setting is largely caused by self-limiting conditions with a low prevalence of serious infections [1] [2]. Parental anxiety can lead to increased healthcare service utilisation including consultation with doctors after office hours, leading to an increased burden to healthcare providers and inappropriate requests for antibiotics [3] [4]. Fever is thought to have a beneficial physiological effect in combating illness [5] and may indicate the presence of serious conditions. However,

excessive anxiety among parents regarding their child's fever, also known as 'fever phobia', may lead to unnecessary medication and over-management at home [6] [7], which may pose safety issues for the child.

The term 'fever phobia' was first coined by Schmitt (1980) [7], who defined it as 'an unrealistic fear of fever expressed by parents', and has been observed in different countries [8] [9] [10]. Parents worry about the feared complications of fever such as febrile convulsion, dehydration, brain damage with subsequent intellectual impairment, and death [4] [11]. However, most parents lack the knowledge to assess the severity of their children's illness [6] [12] [13] and some parents believe fever to be a disease in itself

[14]. Parents may experience negative emotions such as helplessness and guilt if they do not act to reduce their child's temperature [12] [13] [15]. Parents' misconceptions about fever increase their anxiety and eventually influence their management strategy [6] [15].

Many parents define normal temperature and fever incorrectly [16] [17] [18]. Past studies conducted worldwide used core temperatures of 38°C and 39°C to define fever and high fever, respectively [6] [16] [17] [18]. Varying proportions of parents interpret normal body temperature (less than 38°C) as fever [9] [19] [20] [21]. About 24.8% to 63.9% of parents administer antipyretics to their child with a temperature of 37.8°C [9] [19] leading to a risk of over-medication. Parents also have misconceptions regarding antipyretics, believing that they can prevent febrile convulsion and brain damage [22] despite understanding that excessive antipyretics can be dangerous and lethal [23]. Some parents have unrealistic expectations for the fever to resolve within 1 to 2 days. When the duration of fever exceeds their expectations, they bring their children to a doctor [24].

With improved healthcare education, 'fever phobia' has generally reduced from 12–43% in the 1980s [7] [25] to 2–18% in the 2000s [6] [26]. However, it is still prevalent in Asian countries such as Taiwan and Singapore, where 68.8–77.7% of parents believe that fever causes brain damage, compared to only 14.4–21% in developed countries like the USA and Australia [9] [19] [20] [21]. This reflects lower health literacy levels among Asian parents regarding fever.

Most studies conducted in Malaysia regarding health-seeking behaviour are related to antibiotic use for common minor illness. One study on the predictors of health-seeking behaviour in upper respiratory tract infection among children found that ethnicity and low-income level were associated with early visits to seek medical advice [27]. Another study on parental knowledge focused on over-the-counter medications usage and found similar results in insufficient knowledge among parents [28]. To the best of our knowledge, there are no published studies on parental knowledge regarding childhood fever in Malaysia.

Thus, this study aimed to assess the knowledge and concerns of parents of young children regarding childhood fever in this country.

Methods

This cross-sectional study was conducted at the Maternal and Child Health Clinic (MCH) of an urban public primary care clinic in Kuching, in Sarawak, a state in East Malaysia with an ethnically diverse population. Parents of young children aged 6

months to 6 years who visited the clinic were approached to participate in the study. Eligible respondents consisted of adult parents with children aged 6 months to 6 years, who were literate in Malay or English. If both parents were present, the parent who was primarily involved in managing the child with a fever was chosen as the participant. We excluded parents of children with serious chronic medical diseases, such as immunosuppression, congenital heart disease, and neurological or oncological conditions, as well as parents who were not involved in caring for their sick child.

The sample size was calculated to determine the population mean based on the variance derived from Chang's study [21]. A minimum sample size of 135 respondents was required to achieve a 95% confidence interval and 0.5% precision. However, this was increased to 169 participants to allow for the possibility of a 20% non-response rate. Data were collected from June to August 2017 using convenience sampling. Parents were approached in the waiting area of the MCH and screened according to the inclusion and exclusion criteria. Parents who agreed to participate provided written consent before the study materials were administered with researcher assistance.

This study received ethical approval from both the Ministry of Health Medical Research Ethics Committee (Approval number: NMRR-16-1337-31628) as well as the Medical Research Ethics Committee (Project code number FF-2016-385). Permission was also obtained from the local District Health Office.

The study instrument comprised 3 main sections: sociodemographic data of parents, knowledge regarding childhood fever, and parental concerns regarding fever. The section regarding knowledge and concerns regarding childhood fever was adapted from a Taiwanese study with the permission of the original authors [21]. The questionnaire underwent back-to-back translation from the original Chinese version into English and Malay. The translated versions were pre-tested with five parents to determine face validity and comprehensibility. The questionnaire items were reviewed for content validity by an expert panel comprising a consultant paediatrician, two family medicine specialists, and a clinical psychologist. The expert panel also evaluated the correct answers for each item. The questionnaire was modified and adjusted accordingly. Finally, a pilot study was conducted on 17 participants to test the questionnaire. Results showed satisfactory internal consistency reliability with a Cronbach's alpha of 0.7. The mean knowledge score obtained from the pilot study was 13, which was arbitrarily selected as the cut-off point for good knowledge.

The first 18 questionnaire items were true-false questions regarding parents' understanding of fever. For this part, parents were awarded 1 point for

each correct answer, while no points were given for other responses. This was followed by 5 open-ended questions about temperature. We adopted the World Health Organization (WHO) definitions for fever for this study: normal body temperature was defined as an axillary temperature of 36.2–37.4°C, fever as 37.5–41°C, and high fever as 38.5–41°C [29]. A body temperature exceeding 39°C was considered as a fever that might cause harm to children. Again, a score of 1 point was awarded for correct temperatures written by parents. The scale for knowledge ranged from 0 to 23 points.

Parental concerns were assessed using a self-completed close-ended data collection form regarding parents' concerns in certain situations and their common perceptions regarding fever and its outcomes. Samples with missing data on the knowledge scale were excluded from the analysis.

Data were analysed using Statistical Package for the Social Sciences (SPSS) version 24 (IBM). Descriptive analysis included frequencies, percentages, means, and standard deviations. Associations between dependent and independent variables were determined using a t-test, Pearson's correlation, and a one-way ANOVA. Missing data were excluded via pairwise analysis. Level of significance was set at $p < 0.05$.

Results

A total of 157 participants were included, providing a response rate of 94.7%. The majority of participants were young mothers (81.5%), with a mean age of 30.4 ± 6 years. Participants were distributed almost evenly across different ethnicities. About 37.5% of the participants were first-time parents. Most of them had completed secondary education (70.6%) and had a low household income level (80.9%) (Table 1).

Table 1: Baseline characteristics of respondents

Sociodemographic characteristics	Mean (SD)	n (%)
Age (years)	30.39 (6.07)	
Less than 30 years		53 (33.8)
30 years and above		89 (56.7)
Not stated		15 (9.5)
Relationship with child		
Father		28 (17.8)
Mother		128 (81.5)
Not stated		1 (0.7)
Ethnic race		
Malay		40 (25.5)
Chinese		43 (27.4)
Iban		36 (22.9)
Others		31 (19.7)
Not stated		7 (4.5)
Level of education		
Primary or non-formal education		12 (7.6)
Secondary		99 (63.0)
Tertiary		45 (28.7)
Not stated		1 (0.7)
Household income		
Less than RM4000		127 (80.9)
RM4000 to RM7999		23 (14.6)
RM8000 and above		7 (4.5)
Number of children		
One		59 (37.5)
Two		53 (33.8)
Three or more		43 (27.4)
Not stated		2 (1.3)

The knowledge score of parents was normally distributed, with a mean score of 10.03 ± 3.6 (Table 2).

Table 2: Parental knowledge regarding childhood fever

	Mean (SD)	n (%)
Parental knowledge regarding childhood fever	10.03 (3.62)	
Good knowledge (score ≥ 13)		41 (26.1)
Poor knowledge (score < 13)		116 (73.9)

Only 26.1% of parents had good knowledge regarding the management of childhood fever. A large proportion of parents (71.3%) had the misconception that fever causes diseases (Item 17) (Table 3). Almost all parents believed that fever could cause harm to children (Item 23, 93.6%) and indicated that they would administer fever medication to treat feared fever complications (Item 22, 92.4%). Less than half of them knew the correct answer for normal body temperature (Item 8, 49.7%) and fever (Item 13, 39.5%).

Table 3: Items in the knowledge scale according to the percentage of correct answers

Items	Percentage of correct answers
Fever is a condition when the temperature rises above normal. (T)	91.1
Fever is an immune reaction. (T)	80.9
Fever is the consequence of bacterial or viral infection. (T)	80.3
Fever helps alert parents. (T)	79.0
Fever is the sign of a disease. (T)	75.8
Fever is the sign of a potential underlying disease. (T)	71.3
Temperature in high fever (38.5–41°C)	51.0
Normal body temperature (36.2–37.4°C)	49.7
It is necessary to treat fever regardless of body temperature. (F)	43.3
Fever is due to exposure to cold weather. (F)	40.8
Maintaining comfort is more important than bringing down the temperature. (T)	40.1
Fever helps to boost immunity. (T)	39.5
The temperature that indicates fever (37.5–41°C)	39.5
Fever helps to combat illness. (T)	36.3
The temperature that is harmful ($>39^\circ\text{C}$)	36.3
Possible temperature if fever medication is not given (41°C)	34.4
Fever causes disease. (F)	28.7
It is reasonable to wait 3 days before seeing a doctor. (T)	24.2
Fever results from disease. (F)	19.1
Temperature would keep rising if fever medications are not given. (F)	15.3
Fever is due to an imbalance of heat and cold in the body. (F)	14.0
Fever medication can treat complications arising from fever (F)	7.6
Fever will cause harm to children. (F)	6.4

Chinese participants were found to have a significantly better knowledge score compared to other ethnicities ($F(3,146) = 8.584$, $p < 0.001$) (Table 4).

Table 4: Association between parental knowledge regarding childhood fever and sociodemographic characteristics of the parent

Sociodemographic characteristics	Knowledge score Mean (SD)	Statistical tests	P
Age		Spearman's correlation $R = 0.020$	0.847
Relationship with the child		Student's t-test $T = 0.485$	0.628
Ethnicity		One way ANOVA $F(3, 146) = 8.584$	< 0.001
Level of education		One-way ANOVA $F(2, 153) = 22.209$	< 0.001
Household income		One-way ANOVA $F(2, 154) = 17.825$	< 0.001
Number of children		One-way ANOVA $F(2, 152) = 1.677$	0.190

This was confirmed by Bonferroni post-hoc tests (Table 5), which revealed that differences in

knowledge scores were statistically significant between Chinese and other ethnicities.

Parents with tertiary education had better knowledge compared to those with lower educational levels ($F(2,153) = 22.209, p < 0.001$). Finally, parents from the high-income group had better knowledge compared to those from other income categories ($F(2,143) = 17.823, p < 0.001$). These results were also confirmed by post-hoc tests.

Table 5: Bonferroni post-hoc analysis

Categories (I vs J)	Mean difference	Standard error	p-value
<i>Ethnicity</i>			
Chinese vs Malay	2.941	0.737	< 0.001
Chinese vs Iban	3.505	0.758	< 0.001
Chinese vs Bidayah and others	2.245	0.790	0.031
<i>Level of education</i>			
Tertiary vs secondary	3.216	0.517	< 0.001
Tertiary vs primary/non-formal education	5.739	1.043	< 0.001
Secondary vs primary/non-formal education	2.523	0.981	0.033
<i>Household income</i>			
≥ RM8000 vs RM4000-7999	3.627	1.417	0.036
≥ RM8000 vs <RM4000	6.438	1.286	< 0.001
RM4000-7999 vs <RM4000	2.811	0.754	0.001

About 72% of participants reported always being worried when their child had a fever. The three main reasons for parental concern were the discomfort of the child during fever (68.8%), persistently rising body temperature (68.2%), and feared harms of fever (63.7%). The feared harms of fever that worried the parents the most were a seizure (67.5%), brain damage (52.2%), mental incapacity (44.6%), and death (38.9%). Participants reported that their concerns were mainly influenced by their own or a family member's previous experience with child fever (59.9% and 42.0% respectively), not knowing the cause of the fever (39.5%), and doctor's advice upon consultation (35.7%).

Discussion

This study showed that the knowledge level of parents regarding childhood fever was alarmingly deficient. Many parents did not know the correct normal body temperature, and that considered as fever. They were confused with the causal relationship between fever and disease and believed that fever itself is harmful to their child. Parental knowledge concerning the purpose of antipyretics was also incorrect.

In the present study, only 39.5% and 51% of participants knew the correct temperature to define fever and high fever, respectively. This was comparable to previous studies conducted in Australia, the United States, and the United Arab Emirates [19] [20] [26]. Incorrect understanding of

fever would subsequently lead to the more frequent use of antipyretics [3] [30]. This suggests that poor knowledge regarding the temperature considered as fever may be a worldwide phenomenon. Efforts to improve health education regarding fever should be considered for the general public, as the ability to correctly identify fever would protect against inappropriate management.

The association between knowledge and ethnicity, level of education, and income were not unexpected. A previous study found that Chinese parents were less likely than Malay or Indian parents to see a medical professional for upper respiratory tract infection, suggesting they were more comfortable managing the condition themselves possibly because of better health literacy [27]. Education and income are known to influence factors on health literacy [31]. Parents with lower levels of education were found to be more likely to believe that fever is dangerous [8]. Therefore, parents' sociodemographic characteristics could influence their knowledge regarding childhood fever.

There were a large proportion of parents in this study who reported high levels of worry when their child had a fever. Other similar studies in Taiwan, the United Kingdom, and Singapore also had similar findings [9] [21] [32]. Appropriate levels of anxiety or concern are important to promote protective parental behaviours including increasing the fluid intake and being more attentive towards the child [32]. However, excessive or inappropriate concerns should be addressed to avoid negative emotional outcomes in parents.

Common misconceptions regarding complications of fever such as seizures, brain damage, mental incapacity, and death were also reported in other studies [11] [26] [32]. In particular, more Asian parents reported concern regarding possible brain damage (35.9–77.7%) compared to Western parents (7.7–15%) [9] [11] [20] [21] [26] [32]. Soon et al., (2003) [9] postulated that this phenomenon could be due to Asian parents' emphasis on educational attainment. The current study also showed a larger proportion of parents who were worried about fever leading to death (38.9%) compared to other countries (3.8–18%) [11] [19] [32]. The concept of fever among this population could be further explored in future studies.

Teaching parents what to do when their child develops a fever can help to improve parental knowledge and parental satisfaction and reduce inappropriate healthcare visits [33]. However, the method of delivering this education needs to be suited to the population, particularly among those with lower health literacy [33]. Important educational points should include the definition of fever, the role of fever in childhood illnesses, what to assess during febrile episodes, and when a healthcare visit is required [33] [34]. Before administering antipyretics, simple

measures such as tepid sponging and making sure that the child's clothing or bedcovers are not too heavy should be recommended.

This is the first local study on parental knowledge and concerns regarding childhood fever in Malaysia. However, its generalizability is limited by convenience sampling and recruitment from a single public health clinic. There are also different definitions of temperature according to the site of thermometer measurement, which may affect their knowledge scores. We recommend that this study is replicated at multiple sites to gain a better understanding of Malaysian parents' knowledge and concerns regarding childhood fever. The current study has shown glaring deficiencies in the knowledge of this population, which would warrant a health education intervention for parents who bring their children to the clinic for consultation. Developing local self-care guidance for parents may help them to identify the signs of serious conditions, as well as minimise unnecessary healthcare service utilisation. This guidance should also include information regarding correct antipyretic medication administration.

Parents with young children attending Batu Kawa Health Clinic in Kuching, East Malaysia do not have sufficient knowledge about childhood fever and may have excessive concerns about fever. Thus, it is important to provide health education to parents about childhood fever, including management guidelines, and the ability to identify signs indicating the need to seek medical attention.

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