

Original Research Article

DOI: <http://dx.doi.org/10.18203/2349-3291.ijcp20182525>

Fever awareness, management practices and their correlates among parents of under five children in urban India

Sanjana Thota, Nida Ladiwala, Pawan Kumar Sharma, Enakshi Ganguly*

Department of Community Medicine, MediCiti Institute of Medical Sciences, Medchal Mandal, Telangana, India

Received: 10 June 2018

Accepted: 15 June 2018

***Correspondence:**

Dr. Enakshi Ganguly,

E-mail: drenakshig@yahoo.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Awareness regarding fever is reportedly low among Indian urban parents, leading to its over-management among under five children. We attempted to study the awareness and fever management practices of South Indian urban parents. The objectives were to find the awareness of parents regarding childhood fever management, and correlates of practices.

Methods: One hundred parents of under-five children with history of fever in past three months were randomly selected and interviewed using a predesigned tool. Children's weight and height was measured. Awareness scores for causes of fever and fever management were constructed. Logistic regression was done to identify correlates of incorrect practices.

Results: 95% parents were aware about correct temperature above which fever became harmful. Awareness score for causes of fever was poor (<1) among 41% parents. Mothers' complications awareness scores were better than fathers ($p<0.05$). 81% parents used antibiotics; only 18% consulted a doctor before doing so. 17% parents using antibiotics did not complete the prescribed course. The independent correlates of poor fever management practices were working parents (OR: 6.28; 95%CI: 1.7-23.16), lesser number of children (OR: 3.08; 95%CI: 1.01-9.37), poor compliance for antipyretics (OR: 9.20; 95%CI: 1.64-51.52) and giving antipyretics without consulting doctors (OR: 5.43; 95%CI: 1.69-17.47). Poor knowledge of available pediatric antipyretic preparations was negatively correlated (OR: 0.13; 95%CI: 0.02-0.64).

Conclusion: Fever awareness was fair among urban parents. Mothers had better awareness than fathers. Increased awareness for correct fever management of under-five children is desirable among urban parents to reduce misuse of antibiotics and antipyretics.

Keywords: Antibiotics, Awareness, Correlates, Fever, Practice, South India, Under five

INTRODUCTION

Fever is one of the most common symptoms associated with most childhood diseases.¹ It accounts for about 70% of presenting complaints to the pediatric and general medicine outpatient departments.² Out of the many reasons for high parental concern regarding fever, misconception that fever is a disease rather than a symptom has been most commonly reported.³ Febrile

convulsions is another commonly observed phenomenon among children, often confused with seizures. Nonetheless, numerous misconceptions regarding fever cause increased parental anxiety that has existed globally since long.^{4,5} Thirty-five years ago Barton Schmitt had documented these concerns, collectively termed 'Fever Phobia'. 'Fever Phobia' has been reported to result in overly aggressive management by the parents, which at times have harmful effects on children.⁶ It also results in

overcrowding of the hospitals and inefficient allocation of health care resources. Numerous studies assessing parental knowledge, attitude, and practices regarding fever have been conducted in different countries around the world including Jordan, Nigeria, Canada, Morocco, and France.^{2,7-10} These studies have concluded that parental knowledge regarding fever is inadequate, as a result of which there are numerous errors in their approach to fever that include inappropriate usage of antipyretic drugs and antibiotics up to 77%, wrongful use of physical methods of lowering fever and wrong method for measuring fever.^{7,11,12} The variations in responses in these studies are possibly due to geographical, demographics and educational differences between countries and populations.^{2,7,8,9,10} Some educational programs have been reported to benefit parents for appropriate fever management.¹³⁻¹⁵

India has more than two thirds of the world's child population. Hyderabad, a South Indian city, is home to more than 7 lakh children (under 6 years of age) imposing a high burden of childhood illnesses including fever.¹⁶ While some studies earlier showed poor knowledge and perceptions of parents regarding childhood fever reporting their correlates was sparse.^{17,18}

The present study was therefore designed with the objectives to study the awareness of parents of under five children regarding childhood fever and its management, to study the differences between mothers' and fathers' awareness and to identify the correlates of fever management practices among urban parents. We envisioned that having an accurate assessment will help us to design and implement a need-based education program for fever, addressing socio-demographic differences and local cultural practices for its management, that will enable parents to take better care of their children, and also decrease the burden on resource constrained health care system.

METHODS

A cross sectional study was conducted from January 2014 through June 2014 among parents of children aged less than 5 years in Hyderabad city in South India.

The Institutional Ethical Committee approved the study. Four residential areas, having a population of 3497, were randomly selected from a list of residential areas obtained from Greater Hyderabad Municipal Corporation using a computer generated random number table.

The investigators prepared a list of parents having at least one child aged less than 5 years who had an episode of fever in the past 3 months. Children who had to be admitted in hospital for other conditions accompanied by fever were excluded from the study. One hundred available consenting parents were interviewed using a semi-structured pretested schedule.

Development of interview schedule

An interview schedule was developed using locally relevant questions from previous published international guidelines and literature assessing knowledge and practices of parents on childhood fever and its management. It yielded information about definition of fever, concerns about fever, fever management in children, methods of temperature monitoring, methods for controlling high body temperature, sources of information and beliefs regarding potential consequences of fever, in addition to demographic and socio-economic data of parents.

The questionnaire was translated in local language, and back translated in English by a blinded translator for ascertaining validity. It was pretested by two different investigators upon 10 parents having children aged under 5 years, in two different residential areas that were dropped from the final sampling list. Inter-rater agreement was checked and questions with low agreement were suitably modified. The questionnaire containing 18 instruments was finalized after four rounds of pretesting in different unrelated areas (not included for sampling).

Interview

Parents were contacted in their house at a convenient time for administering the questionnaire by an investigator. Two qualified investigators received training in the Department of Community Medicine about the study protocol and administration of the interview schedule. Written informed consent was obtained from each parent for participating in the study.

For parents who could not read or write, the consent (using thumb impression) was obtained in the presence of a witness. In case of two or more under-5 children, information was collected about the youngest child meeting inclusion criteria of having suffered from fever in last three months. The average interview time was about 40 minutes. Confidentiality was maintained while collecting and storing data.

Measurements

Weight and height of all included children was recorded. Weight was recorded to the nearest 0.1 kilograms using SECA platform scale with minimal clothing according to standard guidelines. Instrument was standardized periodically and zero error was corrected every time the weight was measured.

Standing height was measured for children aged more than 2 years using a non-elastic fiberglass tape upto nearest 0.1cm. For younger children, recumbent length was recorded using standard guidelines. Z scores for weight for age were calculated.

Definitions and variables

Childhood fever among under-5 children was defined as a temperature at or above 100°F or 38°C. Awareness of childhood fever was assessed using three variables: Awareness about causes of fever; awareness about temperature above which fever becomes harmful; and awareness about harmful effects of fever. Awareness about causes of fever was scored from 0 to 4, where 0 was worst awareness and 4 indicated complete awareness. Similarly, awareness about harmful effects of fever was also scored from 0-5, with 0 indicating worst and 5 indicating best. Parents were considered to be aware if they responded affirmatively to all three questions and received independent awareness scores of ≥ 1 . Fever management practices were categorized as correct or incorrect. To have correct practice, a parent must have given antipyretics upon doctor's prescription or wet sponging at home; consulted a doctor before using antibiotics; and continued to administer antibiotics and antipyretics to complete the prescribed course even after fever had subsided.

Data entry and analysis

All data were reanalyzed using SPSS software package (SPSS 21.0; Chicago, IL). Results were reported as percentages. Means and standard deviations (SD) were reported for continuous variables. T test was done to study the differences between mothers and fathers. Chi square test was done to study association with correct and incorrect practices. $p < 0.05$ was considered statistically significant.

All variables with $p < 0.1$ entered backward stepwise logistic regression. The variables were: parents' occupation, schooling till 10th standard, sex of parent (primary caretaker), number of children, awareness about fever being harmful, poor awareness about antipyretics, not seeking doctors' consultation before giving antipyretics, not giving full course of antibiotic, source of information for antibiotic other than doctors (family, friends, internet, television, self). Schooling was categorized into two groups, 10th standard and below, and higher than 10th standard.

Table 1: Base line characteristics of the population.

Characteristics	Total N=100	Mother, n=88	Father, n=12	p
Mean age of informants (mean \pm SD) years	<u>30.5\pm4.36</u>	<u>30.23\pm4.27</u>	<u>32.50\pm4.79</u>	0.09
Education (%)	97	96.5	100	
10 th (%)	16	18.2	0	
Intermediate (%)	7	5.7	16.7	
Bachelors (%)	29	29.5	25.0	0.11
Masters (%)	33	29.5	58.3	
Professional (%)	12	13.6	0	
No education (%)	3	3.4	0	
Occupation				
Housewife/Homemaker	62	69.3	8.3	
Maid/ Watchman/ Laundry woman/beautician	8	8.0	8.3	
Teacher/professor	3	3.4	0.0	
Work in a software company	15	6.8	75.0	<0.001
Doctor/ Dentist	4	4.5	0.0	
Lawyer	1	1.1	0.0	
Entrepreneur	1	1.1	0.0	
Govt. employee/ bank employee	6	5.7	8.3	
No. of children				
One child parent	51	46 (52.3)	5 (41.7)	
Two child parents	45	38 (43.2)	7 (58.3)	0.51
Three or more child parent	4	4 (4.5)	0 (0)	
Immunization status of child				
Immunized	96	84 (95)	12 (100)	0.59
Moderate and Severe Malnourishment present in child (<2 Z scores)	20.0	22.7	0.0	0.04

All variables entered the model and exited in stepwise manner, from which the most significant ones were

retained in the model. At exit, independent variables ($p < 0.05$) were reported as correlates.

RESULTS

Characteristics of parents and children

The socio demographic characteristics are shown in table 1. The mean age of respondents was 30.5 (± 4.36) years, with no significant difference between the ages of mothers and fathers ($p= 0.32$). Mothers were the primary

caretakers for 88% children whereas for remaining 12% fathers, separated or widowed, were the respondents.

Overall 97% of the respondents were literate with no statistically significant difference between genders. 69% of the female respondents were housewives and 75% of the male respondents worked in software companies.

Table 2: Awareness of fever, complications and management.

Awareness	Total N=100	Mother, n=88	Father, n=12	P value
Incorrect awareness about fever temperature (%)	38.9	36.1	54.5	0.20
Site of recording fever (correct) (%)				
Armpit	89.9	91.4	14.3	
Ear	4.3	3.4	33.3	0.60
Mouth	5.8	5.2	25.0	
Awareness about cause of fever (%)				
Infection	64.0	63.6	66.7	0.55
Stress	44.0	43.2	50.0	0.44
Vaccination	33.0	35.2	16.7	0.17
Seasonal	7.0	23.9	50.0	0.06
Awareness score for cause of fever (≤ 1 score) (Maximum score = 4) (%)	59.0	56.8	75.0	0.18
Couldn't mention any cause = 0	4.0	4.5	0.0	
Mentioned one condition = 1	37.0	38.6	25.0	
Mentioned two conditions = 2	46.0	43.2	66.7	0.46
Mentioned three conditions = 3	13.0	8.3	13.6	
Mentioned four conditioned = 4	0.0	0.0	0.0	
Awareness about fever being harmful	47.0	48.9	33.3	0.20
Awareness about temperature of fever to become harmful	7.0	5.7	16.7	0.19
Awareness about harmful effects of fever (≤ 1 score) (maximum score = 5) (%)	81.0	84.1	58.3	0.04
Couldn't mention any condition =0	32.0	30.7	41.7	
Mentioned one condition = 1	56.0	60.2	25.0	
Mentioned two conditions = 2	12.0	9.1	33.3	0.03
Mentioned three conditions = 3	0.0	0.0	0.0	
Mentioned four conditions = 4	0.0	0.0	0	
Mentioned five conditions = 5	0.0	0.0	0.0	

51% of the children had no siblings. 96% were completely immunized for age. Severe malnourishment (Grade 3 and 4, calculated using Z scores) was present among 20% children.

Awareness of parents about childhood fever

More than one third of the parents did not know the correct temperature for fever (38.9%) (Table 2). 47.9% parents considered fever to be present if the temperature exceeded 100 degrees F.

Temperature was most commonly recorded in the armpit of the child (89.9%) while measuring temperature using the back of hand on child's forehead was also not uncommon (30%).

Awareness score was constructed using four causes of fever (best/complete awareness=4, worst awareness=0), wherein mean awareness score was 1.68 (+ 0.75). Infection was most commonly cited to be causing fever (64%), while very few parents attributed it to seasonal changes (7%).

Almost half of the parents (47%) perceived fever to be harmful for children, but almost a third of them (32%) could not mention any harmful effects or complications. 87% parents had correct knowledge about antipyretic drugs used for children.

Only 13 % of the parents could mention at least three conditions that caused fever, while 4% could not name any. 18.8% attributed it to supernatural causes. 98%

parents cited death as the most common complication of

fever, followed by lethargy and dehydration.

Table 3: Fever management practices.

Practices	Total N=100	Mother, n=88	Father, n=12	P
Possession of Thermometer (%)				
Had thermometer	71	69.0	91.7	
Didn't have thermometer	28	31.0	3.6	0.09
Recording Temperature (%)				
with back of hand	30	33.3	8.3	
with Thermometer	69	66.7	91.7	0.06
Immediate response to child's fever (%)				
Wet sponging	75.0	75.0	75.0	0.65
Cold water bath	2.0	2.3	0.0	0.77
Gives antipyretic	89.0	90.9	75.0	0.10
Gives ayurvedic medicine	1.0	1.1	0.0	0.88
Gives homeopathy medicine	2.0	2.3	0.0	0.77
Consult doctor	8.0	9.1	0.0	0.34
Awareness of antipyretics used in fever (%)	87.0	86.4	91.7	0.5
Consults doctors before giving antipyretics (%)	41.4	44.8	16.7	0.05
Continues administering antipyretics once the fever is subsided (%)	31.3	33.3	16.7	0.26
Knows when to approach doctors (temperature) (%)	59.1	58.3	59.0	0.59
Uses antibiotics (%)	81.0	81.8	75.0	0.40
Consults doctors before giving antibiotics (%)	83.3	83.3	83.3	0.63
Completes full course of antibiotics (%)	82.3	82.1	83.3	0.64

Table 4: Treatment seeking behaviors regarding fever.

Behavior/ attitude	Total N=100	Mother, n=88	Father, n=12	P value
Correct source of consulting for medication (%)	39.0	35.2	66.7	0.39
Seek normal check-ups (%)				
Clinic	38.0	38.6	33.3	
Nursing home	5.0	4.5	8.3	
Hospital	49.0	47.7	58.3	0.88
RMP	4.0	4.5	0.0	
Homeopathy	3.0	3.4	0.0	
Seek emergency care (%)				
Clinic	29.0	31.8	8.3	
Nursing home	5.0	3.4	16.7	0.24
Hospital	62.0	60.2	75.0	
RMP	2.0	2.3	0.0	
Homeopathy	1.0	1.1	0.0	

Childhood fever management practices of parents

Prevalence of poor fever management practices was 73.0%; 71.6% among mothers and 83.3% among fathers (p=0.31).

The most common fever management practice was administering antipyretics (89%), followed by wet sponging (75%) at home. Antibiotics were given to

children after being prescribed by doctors by 81% parents (Table 3). However, only 8% went to a doctor for complete fever management.

Doctors were consulted before giving antipyretics regarding dosage by 41.4% parents. Nearly half of the parents took their febrile children to a hospital (49%), while in emergency, this proportion increased to 62% (Table 4).

Table 5: Univariate analysis of the fever management practices of the parents.

Variables [#]	Incorrect practice, N=73	Correct practices N=27	Total, N= 100	P value
Education				
Up to 10 th standard (%)	15.1	18.5	16.0	0.10
Intermediate till bachelor degree (%)	41.1	22.2	36.0	0.10
No schooling (%)	0.00	11.1	3.0	0.01
Education below 10 th standard incl. illiterate (%)	15.1	29.6	19.0	0.08
Working parent (%)	42.5	25.9	38.0	0.09
Single child parent (%)	56.2	37.0	51.0	0.07
Poor Awareness about antipyretics used (%)	9.6	22.2	13.0	0.09
Treatment seeking behaviors				
Do not consult doctors before giving antibiotics or antipyretics (%)	80.6	0.0	58.6	<0.001
Do not complete full course of antibiotic (out of people use antibiotics) (%)	23.7	0.0	17.3	0.007
Use other source for use of antibiotics than doctor (pharmacist, friends, internet, TV, self) (out of people use antibiotics) (%)	69.5	45.5	63.0	0.04

[#]The following variables were analyzed using chi square test and not found significant (p>0.10) to enter logistic regression model: Percentage of informants (mother and father), mean age of mother and father, percentage of post graduate education (parents), mean age of first child, mean height, weight and mean BMI of child, percentage of malnourished child (<2 Z scores), percentage not owning thermometer, percentage incorrectly recording body temperature, percentage having incorrect awareness of temperature defining fever, percentage site of recording fever, percentage having poor awareness about cause of fever, percentage having correct awareness if fever is harmful, percentage having correct awareness when temperature of fever become harmful, percentage with poor awareness about complications of fever (<1 score), percentage with poor awareness about temperature to administer antipyretic, percentage not adhering to the treatment duration, percentage having poor awareness of complications needing to doctors consultation (Score ≤ 1), percentage using antibiotics for fever, percentage consulting doctors before giving antibiotics (out of people use antibiotics), percentage treatment seeking behavior for general check- ups and emergency care by type of facility.

Mothers' vs fathers' awareness and practices

22.7% of the children were found to be severely malnourished for whom mother was the primary caretaker, compared with no malnourished children among fathers (p<0.05).

More fathers (54.5%) mentioned incorrect temperature for fever among children compared with mothers (36%). Fathers however had slightly better awareness than mothers about causes of fever (p=0.3). A higher proportion of fathers mentioned at least three correct causes of fever and complications, compared with mothers. None of these differences were, however, statistically significant (Table 2). 91.7% fathers had and used a thermometer to record their child's temperature compared with 66% among mothers. These differences in practices were just significant (p<0.10).

Both mothers and fathers preferred wet sponging equally (75%) to control child's temperature. While awareness of available antipyretics was more among fathers, more mothers took their children to doctors for fever treatment. Antibiotics usage after consulting doctors was equally highly present among mothers and fathers (Table 3).

Treatment seeking behaviors for routine and emergency care among mothers and fathers for fever management of their children were not significantly different (Table 4).

Correlates of incorrect fever management practices among parents

Upon univariate analysis of correct and incorrect fever management practices, no schooling of parents (p=0.01) and poor awareness about seizure being a common complication (p=0.049), as well as not consulting doctors before giving antibiotics (p<0.001), not completing the full course of antibiotics (p=0.007), and using antibiotics advised by sources other than doctors (p=0.04) was significantly associated (p<0.05) with incorrect childhood fever management (Table 5).

Logistic regression was done to find the independent correlates of incorrect fever management practices. Working parents (OR: 6.28; 95%CI: 1.7-23.16), and less number of children (OR:3.08; 95%CI: 1.01-9.37) were positively correlated with poor practices (Table 6).

Furthermore, poor compliance of parents to giving full course of antipyretics (OR: 9.20; 95%CI: 1.64-51.52), and not consulting a doctor, but other sources for giving antipyretics (OR: 5.43; 95%CI: 1.69-17.47) were also

positively correlated. Poor knowledge of parents regarding available pediatric antipyretics (OR: 0.13; 95%CI: 0.02-0.64) showed inverse association with poor practices.

Table 6: Logistic regression showing correlates of poor fever management practices among parents.

Correlates	OR	95% CI
Working parent**	6.28	1.70 23.16
Less no of children*	3.08	1.01 9.37
Poor awareness of Antipyretics*	0.134	0.028 0.640
Poor compliance to full course of antipyretics*	9.20	1.64 51.52
No consultation with doctor before use of antipyretic**	5.43	1.69 17.47

Backward stepwise logistic regression: *p<0.05; **p<0.01

DISCUSSION

Awareness of childhood fever among parents

We reported fair awareness about childhood fever among parents of children aged 0-5 years in an urban community. Parents had satisfactory awareness about infection as a cause of fever (64%), and common antipyretics used for children (87%). Specific parameters related to fever for which parents had poor awareness were normal range of body temperature (40%), stress (44%) and vaccination (33%) causing fever, all fevers not being harmful (47%), temperature at which fever becomes harmful (7%), and at least two harmful effects of fever (12%). This finding is of relevance since urban parents are expected to be literate and having fair access to health care facilities and avenues for health education that our findings did not seemingly support. Awareness of fever among South Indian urban parents in this study was comparable with United States (56%), France (61%), Palestine (78%), Italy (53%), Ireland (63%), and other Indian cities such as Chandigarh (55%).^{3,10,12,17,19,20} Parental awareness was better in Netherlands (88%); and poorer compared with ours in Taiwan (19%), Jordan (48%); and Maharashtra (8%), or Madhya Pradesh (37%) in India.^{7,21-24} Linder et al and Sakaii et al also reported poor parental knowledge on multiple variables related to childhood fever.^{25,26} Models of knowledge improvement leading to improved practices have been shown to be successful in low resource settings.^{27,28} Such models may be replicated or adapted to impart correct knowledge to urban parents as well to augment their awareness.

Practices regarding childhood fever management

The common childhood fever treatment practices reported in present study were recording fever in the armpit (90%), consulting doctors for fever treatment (40%) and continuing to use antipyretics as prescribed by doctors (31%). These practices were concordant with childhood fever treatment practices in other Indian states

and other countries including Taiwan, Ireland and Italy.^{12,20,22} Thermometer was present in about 70% of the families who used it correctly to measure their child's temperature. Srinivasa et al have however shown the presence of a thermometer in only 38% families in Bangalore, a similar geo- socio- demographic region in South India.²⁹ Some studies reported other practices including administering herbal medicine (Taiwan) and tepid sponging (Palestine) which has not earlier been reported extensively from India.^{19,22} We found wet sponging as a prevalent practice to control fever among 75% parents while the use of alternative drugs including homeopathic and others was minimal (2%). A study among under-5 children attempted to categorize the childcare practices including fever treatment practices among Indian children as beneficial, harmful or potentially harmless.³⁰ Most practices in present study belonged to the harmful and potentially harmless categories. This finding is of importance to design health education messages for urban parents, since most of the knowledge and practice apparently is borrowed from previous generation of grandparents. Studies have shown that grandmothers who possess power to decide for the family, tend to follow prevailing rural cultural practices for childcare.^{27,31}

Using antibiotics for fever management was prevalent among a high proportion of parents (80%), with no statistically significant difference between mothers and fathers. Agarwal et al showed the antibiotic misuse among parents to be high, attributable to poor knowledge about indications of such use.³² Gohar et al¹¹ however showed lower misuse of antimicrobials (34%) from a neighboring country. We also found that more than 80 % of parents sought medical advice before starting antibiotics and completed the full prescribed course. This was however, not true for antipyretics where only 40% parents consulted doctors to start antipyretics, and only 30% followed the prescribed dosage and course. A study from Pakistan reported upto 95% parents using antipyretics without prescription for treatment of childhood fevers.¹¹

Correlates of incorrect fever management practices

Present study found an association between working parents and incorrect childhood fever management practices. Such association has been shown earlier by Walsh et al and Abdulkadir et al where working status of parents increased the odds of incorrect fever.^{1,33} Occupation of parents is expected to have direct impact on practices, especially working mothers are less likely to follow/ monitor their children closely for development of fever and other symptoms, for want of time, leading to inaccurate practices for its management.

Less number of children (<2) was associated 3 folds with poor practices, reflecting the previous knowledge and experience of parents for effective fever management. For children with older siblings, it is likely that parents

use their earlier experiences with the elder child for effective management of the present child and make better informed decisions. Others did not find such association.³⁴

Our findings showing not consulting doctors and not completing full course of prescribed antipyretics, positively correlated 9 folds and 5 folds respectively with incorrect practices, are consistent with results shown by Walsh et al, Crocetti et al, and Zyoud et al.^{1,19,34} This also seems plausible since parents who are likely to indiscriminately administer antipyretics reflect poor knowledge about indications and usage of antipyretics; they are equally likely to abruptly stop upon disappearance of signs and symptoms. Antipyretics usage for treatment of childhood fever has been shown to be very common, and knowledge of resulting complications was very less among parents.^{22,35} We reported an association between the advising source of antibiotics (other than doctor) and inappropriate fever management practices which reflects the common behavior of the South Indian urban population. Singh et al have shown earlier that Indian parents learn about fever management from other sources including parents and relatives rather than doctors.¹⁷ Since antipyretics are easily accessible, most people are likely to use them without prescription for symptomatic relief without understanding the complications arising out of inappropriate dosage and schedule. Impicciatore et al. and Kelly et al. have similarly argued earlier that parents are unaware of the fact that many physicians are forced to fever reduction measures because of parental anxiety, and not because of potential complications.^{20,36}

We interestingly, found an inverse correlation between poor knowledge of available pediatric antipyretics and poor parental fever management practices. This is a novel association that has not been reported earlier. This is plausible since the parents who do not have ready knowledge or awareness about available pediatric preparations are likely to consult doctors for appropriate fever management and are likely to follow the drugs and schedule prescribed.

The small sample size might have limited our ability to find associations with other variables previously shown to be positively associated with incorrect management practices. It is also likely that such associations may not exist in our population due to multiple approaches to fever management including alternative stream of medicine, which have not been studied here in- depth. Further, the differences between awareness of fathers and mothers may not be a true representation of the general urban population due to small numbers of fathers in this study.

CONCLUSION

The awareness of South Indian urban parents regarding childhood fever management was fair and variable.

Parents had poor awareness regarding causes and complications of fever. Most parents administered antipyretics and antibiotics indiscriminately without consulting doctors. The independent correlates of poor fever management practices were working parents, lesser number of children, poor compliance to complete prescribed antipyretics and giving antipyretics without consulting doctors. Poor knowledge of available pediatric antipyretic preparations appeared protective. Urban parents must be educated about correct fever management practices to reduce their own anxiety surrounding fever and reduce suffering in their children.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee of Share India- MediCiti Institute of Medical Sciences.

REFERENCES

1. Walsh AM, Edwards HE. Management of childhood fever by parents: literature review. *Journal of Advanced Nursing* 2006;54(2):217-27.
2. Rkain M, Rkain I, Safi M, Kabiri M, Ahid S, Benjelloun BDS. Knowledge and management of fever among Moroccan parents. *EMHJ* 2014;20(6):397-402.
3. Crocetti M, Moghbeli N, Serwint J. Fever phobia revisited: have parental misconceptions about fever changed in 20 years? *Pediatr.* 2001;107:1241-6.
4. Jones T and Jacobsen SJ. Childhood Febrile Seizures: Overview and Implications. *International J Med Sci.* 2007;4(2):110-4.
5. Varma RR. Febrile seizures. *Indian J Pediatr.* 2002;69:697-700.
6. Schmitt B. Fever phobia: misconceptions of parents about fevers. *Amer J Dis in Child.* 1980;134:176-81.
7. Athamneh L, El-Mughrabi M, Athamneh M, Essien EJ and Abughosh S. Parents' knowledge, attitudes and beliefs of childhood fever management in jordan: a cross-sectional study. *J Appl Res Child. Informing Policy Child Risk.* 2014;5(1):8.
8. Oshikoya KA, Senbanjo IO. Fever in Children: Mothers' Perceptions and their Home Management. *Iran J Pediatr.* 2008;18(3):229-36.
9. Stephenson MJ, Rosencrantz A and Kneller P. Childhood Fever: Parental Beliefs and Management. *Can Fam Physician.* 1988;34:63-6.
10. Bertille N, Fournier-Charri`re E, Pons G, Chalumeau M. Managing Fever in Children: A National Survey of Parents' Knowledge and Practices in France. *PLoS ONE.* 2013;8(12):e83469.
11. Gohar UF, Khubaib S, Mehmood A. Self-medication trends in children by their parents. *J Develop Drugs.* 2017;6:173.
12. Chiappini E, Parretti A, Becherucci P, Pierattelli M, Bonsignori F, Galli L and Martino M. Parental and medical knowledge and management of fever in

Italian pre-school children. *BMC Pediatr.* 2012;12:97.

- 13. Alqudah M, Johnson M, Cowin L, George A. An innovative fever management education program for parents, caregivers, and emergency nurses. *Adv Emerg Nurs J.* 2014;36(1):52-61.
- 14. O'Neill-Murphy K, Liebman M, Barnsteiner JH. Fever education: does it reduce parent fever anxiety? *Pediatr Emerg Care.* 2001;17(1):47-51.
- 15. Casey R, McMahon F, McCormick M, Pasquariello P, Zavod W and King F. Fever therapy: an educational intervention for parents. *Pediatrics* 1984;73:600-5.
- 16. Hyderabad (Greater Hyderabad) City Census 2011 data. Available at <http://www.census2011.co.in/census/city/392-hyderabad.html>
- 17. Singhi S, Padmini P, Sood V. Urban parents' understanding of fever in children: its danger and treatment practices. *Indian Pediatr.* 1991;28:501-5.
- 18. Parmar RC, Sahu DR, Bavdekar SB. Knowledge, attitude and practices of parents of children with febrile convulsion. *J Postgrad Med.* 2001;47(1):19-23.
- 19. Zyoud S, Al-Jabi S, Sweileh W, Nabulsi M, Tubaila M, Awang Rahmat, et al. Beliefs and practices regarding childhood fever among parents: A cross-sectional study from Palestine. *BMC pediatrics* 2013;13:66.
- 20. Kelly M, Sahm LJ, Shiely F, O'Sullivan R, de Bont EG, Mc Gillicuddy A et al. Parental knowledge, attitudes and beliefs on fever: a cross-sectional study in Ireland. *BMJ Open.* 2017;7:e015684.
- 21. De Bont EG, Francis NA, Dinant G-J, Cals JW. Parents' knowledge, attitudes, and practice in childhood fever: an internet-based survey. *The Brit J Gen Pract.* 2014;64(618):e10-e16.
- 22. Chang L, Liu C, Huang M. Parental knowledge, concerns, and management of childhood fever in Taiwan. *J Nurs Res.* 2013;21(4):252-60.
- 23. Rajput SK, Wagh SS. Parental Knowledge, Attitude and Practices Regarding Fever in Their Children: A Hospital Based Observational Study. *International J Rec Tren Sci Technol.* 2014;10(30):517-20.
- 24. Agrawal A, Verma P, Beohar V. Awareness of parents of children with fever <5 days attending the outpatient services of Peoples College of medical sciences and research centre, Bhopal, Madhya Pradesh, India. *Int J Contem Pediatr.* 2016;3(3):916-21.
- 25. Linder N, Sirota L, Snapir A, Eisen I, Davidovitch N, Kaplan G, et al. Parental knowledge of the treatment of fever in children. *Isr Med Assoc J.* 1999;1(3):158-60.
- 26. Sakai R, Niijima S, Marui E. Parental knowledge and perceptions of fever in children and fever management practices: differences between parents of children with and without a history of febrile seizures. *Pediatr Emerg Care.* 2009;25:231-7.
- 27. Broome ME, Dokken DL, Broome CD, Woodring B, Stegelman M. A study of parent/grandparent education for managing a febrile illness using the CALM approach. *J Pediatr Health Care* 2003;17:176-83.
- 28. Chang L, Lee P, Guo N, Huang M. Effectiveness of Simulation-Based Education on Childhood Fever Management by Taiwanese Parents. *Pediatrics and Neonatol.* 2016;57(6):467-73.
- 29. Srinivasa S, Syeda KA, Patel S, Harish S, Bhavya G. Parental knowledge, attitude and practices regarding febrile convulsion. *Int J Contemp Pediatr.* 2018;5(2):515-9.
- 30. Ramya AN. Charms in Childrearing. Available at <http://52.172.27.147:8080/jspui/bitstream/123456789/8503/1/RAMYA%20A.N.pdf>
- 31. Sharma M, Kanani S. Grandmothers' influence on child care. *Ind J Pediatr.* 2006;73:295-98.
- 32. Agarwal S, Yewale VN, Dharmapalan D. Antibiotics use and misuse in children: a knowledge, attitude and practice survey of parents in India. *JCDR* 2015;9(11):SC21-SC24.
- 33. Abdulkadir MB, Abdulkadir ZA. A cross-sectional survey of parental care-seeking behavior for febrile illness among under-five children in Nigeria. *Alexandria Journal of Medicine* 2017;53:85-91.
- 34. Crocetti M, Sabath B, Cranmer L, Gubser S, Dooley D. Knowledge and Management of Fever Among Latino Parents. *Clinical pediatrics.* 2008;48:183-9.
- 35. Badawy NAK, Alhajraf AF, Alsamdan MF. Kuwaiti parent's knowledge of their children's fever and their patterns of use of over the counter antipyretics. *AMJ.* 2017;10(10):848-55.
- 36. Impicciatore P, Nannini S, Pandolfini C, Bonati M. Mothers' knowledge of, attitudes toward, and management of fever in preschool children in Italy. *Prev Med.* 1998;27(2):268-73.

Cite this article as: Thota S, Ladiwala N, Sharma PK, Ganguly E. Fever awareness, management practices and their correlates among parents of under five children in urban India. *Int J Contemp Pediatr* 2018;5:1368-76.