

Systematic review finds that fever phobia is a worldwide issue among caregivers and healthcare providers

Short title: fever phobia - systematic review

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Short title: Fever phobia

Word Count

- Abstract: 198 words

- *Body of the manuscript:* 1617 words

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KEYWORDS: anxiety; fever phobia; nurses; over treatment; physicians.

Abstract

Aim: Fever phobia describes exaggerated concerns about the consequences of childhood fever and broader awareness is needed in everyday clinical practice. We investigated the factors associated with fever phobia in caregivers and healthcare providers and the geographical distribution of the issue.

Method: The National Library of Medicine and Excerpta Medica databases were searched for papers on fever phobia, excluding those that tackled fever phobia.

Results: We retrieved 76 papers, published in English from 1985-2018, which covered wide areas of Asia, Europe, America, Africa and Australia. Fever phobia was common and 65 papers confirmed the occurrence of fever phobia among 26,521 caregivers. These showed that a number of factors were significantly associated with fever phobia, including low educational or socioeconomic levels, a history of febrile seizures in the child and young maternal age. Fever phobia was also more common in Bedouins and in people from Latin America, Southern Italy and Turkey. There were also 15 papers that addressed fever phobia among 4,566 healthcare providers. All the reports suggested that a fear of fever and a tendency to over treat was common among physicians and nurses.

Conclusion: Fever phobia was a common world phenomena that affected caregivers and healthcare providers.

Key notes

- We reviewed fever phobia and identified 76 papers published from 1985- 2018 covering 26,521 caregivers and 4,566 healthcare providers.
- This showed that fever phobia was a common world phenomena that affected caregivers and healthcare providers and led to over treatment.
- A number of factors were significantly associated with fever phobia in caregivers, including low educational or socioeconomic

levels, a history of febrile seizures in the child and young maternal age.

Abbreviations: None

INTRODUCTION

Fever is an everyday problem in paediatrics and one of the most common reasons that parents seek medical attention for their child (1,2). Four decades ago, Barton D. Schmitt, a paediatric hospitalist in Denver, invited the parents of children with fever to complete a questionnaire (3). The answers suggested that they were often unduly worried about the consequences of fever and frequently treated fevers too aggressively. As a consequence, the term fever phobia was coined, to denote an exaggerated and irrational fear of fever effects, a tendency to over treat fever or both (3). These fears included concerns about brain damage, learning disabilities, blindness, hearing loss and even death (3). On the other hand, over treatment included the administration of antipyretic drugs in afebrile children with a history of febrile seizures, waking up a child to measure their temperature or the routine use of an alternating regimen of paracetamol and ibuprofen.

Meanwhile, more and more data confirmed that most fever is not dangerous in itself and is a beneficial response to infection (1-3). Since broader awareness of fever phobia is important in everyday clinical practice, we carried out a comprehensive literature search. In particular, we wanted to investigate factors that were potentially associated with caregivers' fever phobia, the occurrence of fever phobia among healthcare providers and the geographical distribution of the phenomena.

Methods

Since 1980, when Barton D Schmitt published his seminal paper (3), there have been additional reports that have addressed and tentatively catalogued fever phobia, mostly by using a slightly modified version of his original questionnaire (3). Between January and March 2018, we performed a computer-based search of the terms fever phobia OR pyrexiphobia OR pyrexophobia OR febriphobia with no date limits in the US National Library of Medicine, Excerpta Medica and Google Scholar database. The principles underlying the UK Economic and Social Research Council guidance on the conduct of synthesis and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses statement were applied. Secondary references were also reviewed. For the final analysis, we selected original reports published as full-length papers or letters to the editor, which addressed the issue of misconceptions and unwarranted fears pertaining to fever in children. Reports evaluating possible interventions to tackle fever phobia were excluded. The data were extracted from each of the selected reports using a predefined database form. Studies published in languages other than Dutch, English, French, German, Italian, Portuguese or Spanish were excluded.

The chi-square test was used for statistics and a two-sided value of $p < 0.05$ was considered to be statistically significant.

RESULTS

Search results

The literature search process is summarised in Figure 1. For the final analysis, we retained 76 papers published between 1985 and 2018 (4-60, S61-S78), which had been published in English between 1985 and 2018. The other languages did not identify any suitable papers. There were 26 papers from Asia: one each from Iraq, the People's Republic of China, the Republic of China, South Korea and the United Arab Emirates, two each from India, Japan, Iran and Saudi Arabia, four from Israel and Malaysia, and five from Turkey. A total of 20 papers came from Europe: one each from Germany, Greece, Ireland, Portugal and Switzerland, two from Denmark, three from the Netherlands, and five each from Italy and the United Kingdom. There were 20 papers from America: one from Mexico, five from Canada and 14 from the United States of America. Five papers came from Australia. Finally, there were five papers from Africa: one each from Kenya and Tanzania, and three from Nigeria.

Fever phobia among caregivers

The possible occurrence of fever phobia was addressed by 65 papers that covered 26,521 caregivers (4-8,11-19,21,23-25,27-39,41-45,47,48,50,52,53,55-60,S61-S78). Fever phobia was detected in all of the reports.

Factors that predisposed caregivers to fever phobia were addressed in many of the papers. The possible link between fever phobia and either parental educational or socioeconomic level, parental ethnicity, a history of febrile seizures, maternal age or having three or more children in a family were analysed each in at least three reports.

The possible association between either educational level or socioeconomic status and fever-related anxiety was investigated in 23 papers covering 13,238 families. An association between high educational level or high socioeconomic status and fever phobia was found in four reports covering 1,263 families. Finally, 14 reports covering 9,234 families found that low educational or socioeconomic level were associated with an elevated degree of fever phobia. We therefore concluded that fever phobia was linked with low educational and socioeconomic status.

The possible existence of a relationship between parental ethnicity and fever phobia was addressed in 12 papers covering 3,792 families. All the reports confirmed the existence of such a correlation: in the United States among caregivers of Latin American extraction, in Israel among caregivers belonging to the traditional Bedouin group, in Germany among Turkish migrants and in Italy among caregivers from Southern Italy.

A significant association between the child having a past history of febrile seizures and fever phobia was addressed by three reports covering 1,157 families, and was only found in one large report covering 746 families.

A total of three papers covering 5,027 families speculated that fever phobia was elevated among young mothers. This hypothesis was confirmed in two reports of 4,827 mothers.

The existence of a link between family size and fever-related anxiety was addressed in seven papers covering 6,694 families. Only two reports covering 1,125 children found that having an only child

predisposed the parents to fever phobia. On the contrary, five articles comprising 5,569 families did not confirm this tendency.

The relationship between the child being young and fever-related anxiety was addressed by two papers covering 538 children and these found an association among 327 Greek but not 211 Dutch mothers. Fever-related anxiety was common among 78 British caregivers who had had previously attended hospital with a febrile child, but not among 211 Japanese caregivers. Finally, a Canadian report on 510 families found that fever phobia was more prominent among caregivers whose children were febrile at the time of interview, compared to the caregivers of children, who were either healthy or presented because of a minor trauma.

The results of studies covering caregivers are summarised in Table 1.

Fever phobia among healthcare providers

A total of 15 papers addressed the possible occurrence of fever phobia among 4,566 healthcare providers (9,10,20,22-24,26,40,46,49,51,54,567,568,579). The papers covered 4,566 physicians and 811 nurses. In one paper on 44 healthcare providers, the physicians and nurses were not separately analysed. All studies suggested that exaggerated fears about the consequences of fever and a tendency to over treat fever were common among healthcare providers. A total of three studies comparing the approach to fever among 1,475 healthcare providers found that, whilst most physicians were aware that fever was beneficial to the body's defence system, many nurses were not. Finally, a Canadian study found that fever

phobia was more prevalent among family doctors than among general paediatricians.

Geographical distribution of fever phobia

Table 2, which depicts the geographical distribution of fever phobia, shows that fever phobia was observed among caregivers from all continents. The issue of fever phobia among healthcare providers has so far been addressed in all continents except Africa.

DISCUSSION

This review, which complemented an analysis published in 2016 (S80) and benefited from the large number of identified original papers, found that fever phobia occurred worldwide among caregivers. Furthermore, healthcare providers also suffered to some extent, from irrational fears of fever and these sometimes resulted in over treatment. This was more common in nurses than physicians.

The data indicated that fever phobia was common among parents with low educational or socioeconomic levels, young mothers, children with past history of febrile seizures and some ethnic groups. On the contrary, no clear-cut correlations were found between fever phobia and family size or the child's age.

The views of healthcare providers about fever phobia is an interesting issue that is likely to have been under-recognised issue. Clinical practice guidelines base standards of care based on evidence-based medicine and prescriptions that do not comply with these guidelines are increasingly being reported. These relate to both under and over-treatment. Under prescribing effective therapies

is common in conditions such as diabetes, cardiovascular diseases, or obstructive pulmonary diseases, and pain (S81,S82). On the other hand, over-treatment is common in acute respiratory and urinary tract infections (S83,S84).

Guidelines seek to calm fever phobia in caregivers and healthcare providers by reinforcing the beneficial qualities of fever and encouraging the use of antipyretics for discomfort rather than for temperature control (S85-S87). Complicated febrile convulsions are a frightening experience, but administering antipyretics at the first sign of fever does not prevent recurrences. On the other hand, prophylactic antiseizure drugs decrease the frequency of recurrent seizures, but the risk of side effects might outweigh the benefits (S85-S87).

This study had some limitations. First, the heterogeneity of the study designs used in the literature partly precluded a quantitative comparison of the results and an in-depth analysis of the predisposing factors. Second, the studies on fever phobia included in the analysis were based on self-reports, which do not always reflect everyday practice. Third, the questionnaires were filled in in different settings, such as emergency room as compared to the waiting rooms or the waiting rooms of an outpatient clinics, and these could have negatively or positively influenced the anxiety of the responders. Finally, this review does not offer explanations about why healthcare providers do not follow guidelines on fever management.

With respect to the last issue, an ad-hoc conference was held among the authors of this report to try and identify why healthcare

providers do not follow guidelines on fever management. We considered the factors previously identified as possible barriers for adherence to asthma guidelines (S88). The participants suggested six possible relevant barriers that healthcare providers face when managing febrile children using current guidelines and rated their supposed clinical relevance (Table 3).

CONCLUSION

This survey showed that fever phobia was a worldwide issue that was prevalent among caregivers and healthcare providers. Defining practice guidelines for the symptomatic management of fever in children is only one step in the process of developing evidence-based care.

Appendix S1: references from S61 to S88.

Acknowledgments

- The authors would like to thank Dr. Alec Villa for his assistance in the linguistic revision.

CONFLICTS OF INTEREST

The authors have no conflicts of interest to declare.

FINANCE

This review received no external funding.

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Figure's legend

Figure 1

Fever phobia. Flowchart of the literature search process.

Table 1: Factors possibly associated with parental fever phobia.

	Significance
• Low educational and socioeconomic status	$P < 0.0001$
• Ethnicity (Latin Americans, Bedouins, Turkish, Southern Italians)	$P < 0.001$
• Past history of febrile seizures	$P < 0.0001$
• Young maternal age	$p < 0.0001$
• Child's age	not significant
• Family size (≥ 3 children)	not significant
• Having a febrile child	not significant

Table 2: Geographical distribution of fever phobia among caregivers and healthcare providers.

Continent	Reports (N)	Caregivers (N)	Healthcare providers (N)
Africa	5	2,189	-
America	20	5,573	369
Asia	26	13,786	1,552
Europe	20	4,521	2,579
Oceania	5	452	66

Table 3: Set of barriers associated with non-adherence to guidelines suggested in the literature [S88], examples of barriers possibly underlying over-treatment of fever among healthcare providers and presumed relevance (classified in an ad-hoc conference among authors). Relevance was scored as high, moderate or low.

General barriers underlying non-adherence	Example	Relevance
Poor awareness or familiarity	Guidelines presented in exceedingly long documents	High
Inertia of previous practice	Healthcare workers manage fever the way they have always done	High
	Guidelines recommending elimination of traditional aggressive pharmacotherapy of fever are more difficult to implement than guidelines adding supplemental pharmacotherapy	High
Poor agreement	Healthcare workers believe that antipyretics partly prevent reappearance of febrile seizures	Moderate

Lack of self-efficacy	Lack of time (and reimbursement) for parental education about fever	Low
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Lack of outcome expectancy	Expectation that parental education about fever will not lead to any consequence	Moderate
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