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A Systematic Review to assess Nurses' and Physicians' Attitudes, Knowledge, and Perceptions toward Fever in Children

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Abstract:

Context: Fever is a prevalent symptom in children commonly managed by nurses and pediatricians. Despite its routine occurrence in clinical settings, fever often evokes unwarranted concerns among parents and healthcare professionals alike.

Objective: This study aims to explore the impact of healthcare professionals' knowledge, perceptions, and attitudes toward fever on its management. Additionally, it seeks to assess the effectiveness of educational interventions in enhancing nurses' understanding and altering their attitudes and perceptions regarding childhood fever.

Data Sources: A systematic review was conducted following PRISMA international guidelines and Cochrane recommendations. Articles focusing on healthcare professionals' (doctors and/or nurses) views on fever management in children and the utilization of antipyretic medications were selected for analysis.

Study Selection: The study included articles that examined healthcare professionals' knowledge, perceptions, and attitudes toward childhood fever and antipyretic use. Data extraction involved a qualitative analysis, categorizing studies based on educational interventions for nurses regarding fever management in children and evaluating their outcomes.

Results: The qualitative synthesis encompassed 16 articles, to assess the effectiveness of educational programs on fever management among nurses.

Conclusion: Findings from the review suggest that nurses and physicians tend to overtreat fever in children, influenced by their perceptions and attitudes. The recommendation grade for utilizing educational programs to modify healthcare professionals' attitudes, perceptions, and knowledge concerning childhood fever and improve clinical practices among nurses is rated as D.

Keywords: nurses; pediatric; pediatricians; fever; antipyretics

Introduction:

Fever is a common occurrence in children and is frequently managed by nurses and pediatricians. Despite its prevalence, healthcare professionals often share common misconceptions with parents, such as fears of brain damage, seizures, and mortality associated with fever. However, scientific evidence suggests that fever reduction does not impact morbidity or mortality in children with acute febrile illnesses, as fever is a regulated and self-limited response controlled by the hypothalamus. In fact, fever serves beneficial physiological functions in combating infections, including signaling the presence of a pathological condition and inhibiting bacterial and viral growth. Therefore, the focus of fever management should prioritize comfort and employ antipyretic therapies judiciously, as febrile seizures are not linked to brain damage, and antipyretics do not prevent them. (Chiappini et al., 2018)

Navarro and de Carlos highlighted that healthcare professionals' misconceptions about fever in children stem from cultural beliefs passed down over generations, particularly regarding fears of febrile seizures and neurological harm. However, evidence contradicts these fears, showing that febrile convulsions do not cause neurological damage, and antipyretics are not preventive measures for them, despite occasional use for this purpose. Distinguishing fever as a sign from the underlying condition is crucial for providing appropriate care to children, including monitoring for signs of serious illness, preventing dehydration, and ensuring adequate nutrient intake. (Martins & Abecasis, 2016)

Studies by Razón and Demir and Sekreter highlight the limited understanding of fever among healthcare professionals, leading to anxiety in managing febrile children and misconceptions about the potential harm of fever. Defining temperature thresholds for administering antipyretics is essential for consensus among healthcare providers, as seen in research with Australian nurses, who noted conflicts arising from using medications based on factors like a child's discomfort rather than strict temperature criteria. Other factors influencing antipyretic practices include parental influence, peer and professional dynamics, and workload, as noted by Australian nurses. (García Puga et al., 2012)

Educational programs have emerged as valuable tools for modifying healthcare professionals' daily practices, including ingrained knowledge, attitudes, and perceptions. The studies included in this review aimed to assess the impact of educational interventions on increasing knowledge, changing attitudes, or modifying both knowledge and attitudes among nurses. (Jeong & Kim, 2014)

This systematic review aim to evaluate how healthcare professionals' knowledge, perceptions, and attitudes toward fever management in children influence their clinical practices. Additionally, it seeks to determine whether educational programs can enhance nurses' knowledge and alter their attitudes and perceptions regarding children's fever.

Materials and Methods:

Design:

A systematic review was conducted to explore doctors' and nurses' knowledge, attitudes, and perceptions concerning fever in children. This study adhered to PRISMA international standards and Cochrane recommendations and was registered in PROSPERO

Search Strategy:

searches were performed in databases such as Virtual Health Library, Pubmed, Web of Science, Cochrane, and EBSCOhost meta-search. The search strategy involved DeCS/MeSH descriptors, free terms, and Boolean operators to ensure comprehensive results.

Subsequently, a directed or snowball search was conducted by reviewing references in articles and related literature to capture relevant studies not initially identified. The selection process involved two phases: screening titles and abstracts followed by full-text evaluation based on inclusion criteria and quality assessment.

Inclusion and Exclusion Criteria:

Included articles focused on healthcare professionals' (doctors and/or nurses) knowledge, perceptions, and attitudes toward fever in children under 14 years old, including antipyretic use, in hospital and community settings. Excluded were articles focusing solely on biological aspects of fever, pharmacological properties of antipyretics, fever post-vaccination, temperature measurement methods, parental views on fever, discomfort assessment in children, letters to the editor, expert comments, and translations of original articles.

Data Collection:

Articles were selected in pairs, and disagreements were resolved by a third researcher. The selection process involved four stages: identification, screening, selection, and inclusion. An Excel coding sheet categorized articles based on their content (e.g., literature reviews, surveys, educational programs).

Results:

Search Results:

The search conducted 1298 articles from databases and 42 from the "snowball" technique. After removing duplicates, 1046 articles remained, of which 88 were evaluated in full text. 16 studies were included . The qualitative synthesis included various study designs, such as bibliographic reviews (44%), quantitative studies (51.3%), and qualitative research (2.4%). Among the quantitative studies, quasi-experimental designs evaluating educational program effectiveness were prominent.

Description of Included Studies:

The included studies comprised bibliographic reviews, systematic reviews, quantitative studies using surveys and audits, and qualitative research focusing on doctors' and nurses' practices, knowledge, attitudes, and perceptions regarding fever in children. Descriptive studies included nurses working in pediatric settings, with varying levels of training in pediatrics.

Variables Measured in Educational Programs:

The qualitative analysis categorized studies based on the variables they measured, such as knowledge, attitudes, and perceptions regarding fever care in children. Educational methods varied, including blended learning programs, face-to-face lessons, training booklets, and peer education programs. Studies assessed changes in knowledge, attitudes, and perceptions pre- and post-intervention among nurses in hospital settings.

Table1. Studies characteristic

First Author & Year	Design	Data Collection	Objectives	Population and Sample	Results	Conclusions
El Khoury et al. 2010	Descriptive	Questionnaire	Understanding the perception and management of fever in children up to 6 months of age by pediatricians in the United States.	Population: 35,600 pediatricians from the "Physicians' desk reference" Sample: 401 American pediatricians subscribed to the "Physicians' desk reference".	On average, in children divided into the three age groups (0–2 months, 2–4 months and 4–6 months), respondents indicated that they considered temperatures between 37.8–38.1°C to be mild, 38.3–38.7°C to be moderate, 38.8–39.5°C to be severe and 39.5–	Pediatricians in the United States are more concerned about general fever than post-vaccination fever. The management and definitions of fever severity by sample pediatricians depend on the age of the child. Recommendations for fever control depended on the level of fever, the age of the child, the timing of vaccination, and the time of day the fever was reported.

					40.3°C to be extremely severe. In general, respondents indicated that they would recommend the use of antipyretic drugs at temperatures of around 38.3°C.	
Lava et al. 2012	Descriptive	Questionnaire	The aim of this study was to describe the treatment of children with fever by pediatricians in Switzerland.	Population: 900 pediatricians (72% of certified pediatricians in Switzerland). Sample: 322 Swiss pediatricians.	2/3 of the participants indicated that sometimes or often a fever that does not respond to antipyretics suggests an underlying bacterial infection. In these cases, half of the pediatricians add a second drug to the existing regimen, about a quarter continue the original treatment, and the remaining quarter replace the initial drug with another. Almost all respondents (92%) indicated that they believed that the exaggerated fear of fever was widespread. However, 81% of	The results of the Swiss national survey on fever management among pediatricians suggest that the child's overall appearance and comfort are now recognized as the most important factors in initiating antipyretic treatment. However, the survey also suggests that there is often a gap between what scientific evidence has found to be the most effective intervention and clinical practice. The data could be used as a basis for developing practical guidelines for the treatment of children with fever based on available scientific evidence, while considering current practices of pediatricians, which are influenced by several irrational factors.

					respondents indicated that they do not lower the temperature threshold solely to reassure parents.	
Bettinelli et al. 2013	Descriptive	Questionnaire	Investigate whether hospital pediatricians, community pediatricians and paediatric residents differ in their day-to-day clinical practice with respect to compliance with available guidelines on fever control.	Population: 118 pediatricians from the northern area of Lombardy were invited to participate (41 hospital pediatricians, 48 community pediatricians and 29 paediatric residents). Sample: 79 pediatricians: 29 hospital, 30 community and 20 residents.	The management of a child who is comfortable and whose fever does not respond to the first antipyretic differs between groups: Paediatric residents replace the first drug with another antipyretic (50%) or, more rarely, add a second drug to the existing regimen (20%) more often than community pediatricians (20% and 3%) and hospital pediatricians (10% and 7%). Physical antipyretic methods are used in all groups by at least 59% of participants, with no significant differences between groups. Similarly, in all groups,	This exploratory study demonstrates limited disagreement among paediatric residents, community pediatricians and hospital pediatricians regarding the management of symptomatic fever.

					86% of participants believe that it is sometimes or often possible to educate and reassure families about the fear of fever.	
Chiappini et al. 2012	Descriptive	Questionnaire	Investigate medical and parental knowledge and management of fever in preschool children.	Population: 648 pediatricians who attended the 14th National Congress of Practice Paediatrics, held in Florence in November 2009 All parents of children aged 0		

First Author & Year	**Design**	**Data Collection**	**Objectives**	**Location and Date of Execution**	**Population and Sample**	**Results**	**Conclusions**	**Quality of the Study (CASPe)**	**Levels of Evidence (SIGN, Gálvez Toro)**
Chiappini et al. 2013	Descriptive Questionnaire	Evaluate the impact of the publication of the IFG "Italian fever guidelines" on the knowledge and behavior of Italian	Italy, Nov 2009 - June 2010	480 pediatricians in 2009, 300 pediatricians in 2012	Most recommended physical methods for persistent fever; improvement in knowledge on antipyretic use; need for further	Importance of IFG dissemination; discouragement of misbehaviors like alternate antipyretic use	MEDIUM 3	Medium	

		pediatricians			dissemination of IFG				
Chiappini et al. 2018	Descriptive Questionnaire	Assess fever management by Italian pediatricians post-IFG publication	Italy, 2009–2012	300 pediatricians in 2012, 562 pediatricians in 2015	Improved management but persistent incorrect habits; need for educational interventions	Highlighting improvements in management but need for better adherence to IFG recommendations	MEDIUM 3	Medium	
Martins & Abecasis 2016	Descriptive Questionnaire	Assess knowledge of professionals and parents about fever in children	Portugal, Dec 2013 - Apr 2014	49 nurses, 228 family doctors, 291 pediatricians, 256 parents	Varying attitudes towards fever management; fear of fever among parents and nurses; common practice of alternating antipyretics	Need for educational interventions to avoid perpetuation of fever phobia	MEDIUM 3	Medium	
Mayoral et al. 2000	Descriptive Questionnaire	Identify fever control strategies and assess frequency of alternating antipyretics	USA, Feb - Oct 1998	161 pediatric professionals	Common practice of alternating antipyretics; increased likelihood with less experienced pediatricians; risk of incorrect doses and toxicity	Alternating antipyretics common due to fear of fever; need for clearer guidelines and caregiver education	LOW 3	Medium	

Walsh et al. 2006	Descriptive Questionnaire	Examine nurses' knowledge and beliefs about fever	Australia	51 pediatric nurses	Nurses had low knowledge of antipyretics and varied beliefs about fever management.	Nurses' beliefs did not always align with their level of knowledge.	MEDIUM 3			
Melamud et al. 2008	Descriptive Questionnaire	Investigate how pediatricians handle fever	Argentina, July 2005	1599 pediatricians	Antipyretic choice not significantly related to professional experience.	Antipyretic choice often based on clinical experience rather than scientific evidence.	LOW 3			
García Puga et al. 2012	Descriptive Questionnaire	Evaluate advice given to parents about fever	Spain, May to September 2009	109 pediatricians	Varying practices observed among professionals regarding fever management and advice to parents.	Highlighted the need for clearer guidelines and practices regarding fever management.	MEDIUM 3			
Demir & Sekreter 2012	Descriptive Questionnaire	Identify primary care physicians' knowledge and attitudes regarding fever	Turkey, April to May 2010	80 primary care physicians	Identified misconceptions and variations in fever management among physicians.	Emphasized the need for educational programs and guidelines for appropriate fever management.	MEDIUM 3			
Greensmith 2012	Descriptive Questionnaire	Describe nurses' knowledge and attitudes towards fever management	Ireland, 2012	370 nurses	Nurses showed inconsistencies in knowledge and attitudes regarding fever management.	Highlighted the risk of incorrect knowledge transfer and reinforcement of inappropriate attitudes.	MEDIUM 3			

Walsh et al. 2005	Descriptive Questionnaire	Describe Australian nurses' knowledge and attitudes regarding fever	Australia	51 pediatric nurses	Nurses had positive and negative attitudes towards fever management, often not aligned with best practices.	Identified inappropriate practices and attitudes among nurses regarding fever management.	MEDIUM 3			
Edwards et al. 2003	Descriptive-observational Audit	Document nurses' practices in administering antipyretics	Australia, March 2000	Data on 67 children	Highlighted inconsistencies in nursing practices and potential harm in fever management.	Emphasized the need for clear guidelines and individualized fever management.	MEDIUM 3			
Edwards et al. 2001	Qualitative Focal groups	Identify nurses' practices and decision-making criteria for fever control	Australia	15 nurses	Identified variations in fever management practices among nurses.	Highlighted the need for clear guidelines and individualized fever management.			Gálvez Toro (Nivel 4)	

Discussion

This systematic review, comprising 16 studies, explores the influence of healthcare professionals' understanding, attitudes, and practices regarding fever management in children. It also investigates whether educational interventions can alter these perceptions and improve clinical care for febrile children.

Razón emphasizes that insufficient understanding often leads to aggressive treatments, such as combination antipyretic therapy, aimed at achieving normothermia. (Razón Behar et al., 2011)

Healthcare professionals generally acknowledge the potential benefits of fever but express concerns about its long-term effects. For instance, in Ireland, 50% of nurses believe fever benefits the immune system, while 84.9% caution against excessive paracetamol use, emphasizing prompt fever treatment to prevent seizures. (Sullivan & Farrar, 2011)

Studies reveal that professionals prioritize temperature thresholds over discomfort when deciding on antipyretic administration. Many physicians view antipyretics primarily as fever symptom reducers, leading to their widespread prescription even for children who are active. (Marzuillo et al., 2014)

Different studies indicate varying temperature thresholds for initiating antipyretic treatment, ranging from 38.3 ◦C to 38 ◦C or lower, highlighting inconsistencies in clinical practices. (Richardson & Purssell, 2015)

Despite recognizing fever's immune benefits and discomfort considerations, a significant percentage of doctors continue to recommend antipyretics. (Purssell, 2013)

While a combination of antipyretics effectively lowers body temperature, questions persist about its safety, efficacy in improving comfort, and overall clinical outcomes. However, only a minority prioritize a child's discomfort as the primary symptom. (El-Radhi, 2012)

Physical interventions like cold compresses or removing clothing are sometimes favored over antipyretics, indicating evolving practices over time. (Clarke, 2014)

Educational efforts have been made to change professionals' attitudes and practices, with varying success. Peer education, hybrid online-face-to-face approaches, and traditional training methods have shown mixed results in improving knowledge and attitudes towards fever management. (McDougall & Harrison, 2014)

In conclusion, healthcare professionals' perceptions and practices regarding fever in children impact clinical care. Educational interventions have potential but require further validation to effectively modify clinical practices and improve patient outcomes.

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