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Review Article

Perception of Childhood Febrile Illness among Parents and Health Professionals: Where do We Stand?

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ABSTRACT

Fever is a common symptom in children, which represents one of the burning issues for parents due to excessive concern and frequent medical attention. Most febrile episodes are not harmful but could be viewed as a beneficial response to infection. Despite this, ''fever phobia'' remains prevalent among parents, and improper handling of childhood fever has been recorded for nearly two decades. Nevertheless, numerous health professionals have documented unanticipated concerns regarding the handling of negative attitudes. This was a systematic review of the literature to explore the perception of childhood febrile illness among parents and health professionals based on a comprehensive literature search. Childhood febrile illness continues to provoke fear in both parents and healthcare providers. Healthcare professionals play a crucial role as the main source of information for parents and carry the responsibility of alleviating parental anxiety. A multicomponent intervention including training of healthcare professionals should be implemented to achieve a reduction in hospital burden and undue parental concern, thereby improving the management strategy of uncomplicated febrile illness in children. The concerning misperception regarding fever and its management in children persists among both parents and health professionals within the community, despite advancements in education and scientific knowledge. There is an utmost requirement to prepare specific guidelines and spread awareness in the community about the management of febrile illnesses in children.

Keywords: *Fever, Child, Perception, Parents, Health professionals.*

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INTRODUCTION

Fever is the most common reason for parents to seek medical health care. The incidence of fever increases between the ages of 2 months to 3 years of age. The American College of Critical Care Medicine (ACCCM) and the Infectious Diseases Society of America (IDSA) defined fever as a body temperature of 38.3°C (101°F) or higher[1]. Fever in children mainly arises from infectious and non-infectious origins[2]. Respiratory infections and gastroenteritis are thought to be the predominant causes of fever in children and are thought to be benign and self-limited. Dehydration, injuries, cancer, and side effects of some medicines like antibiotics e.g. sulfonamides and minocycline are the important non-infectious causes of fever[3]. Notably, pneumonia, enteric fever, and dengue are added to the list of fever aetiology in developing countries like Bangladesh. Again COVID-19 is also an emerging issue, though

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the incidence and complications are low in children[4]. Parents encounter numerous instances of fever throughout the upbringing of their children. Nonetheless, comprehending and managing febrile illness continues to be as significant public health challenge for parents representing a prominent reason for emergency department visits among children under the age of 15 years[5].

Commonly, it turns into parents' frustration and dissatisfaction regarding primary care, leading to wrong assumptions about fever in children. Moreover, adequate knowledge regarding this condition could affect their attitude and performance while parents' fear of fever in their children sometimes results in the overuse of medication[6].

Furthermore, notwithstanding the presence of advanced scientific evidence, ancestral remedies for fever persist across generations. Apart from conventional practices like sponging and bathing, some improper methods, including coin massage, alcohol rub, etc., are prevalent in different societies to reduce children's body temperature[7]. As proposed by different researchers, recognition of incorrect behavioural factors and effective educational programmes targeting specific knowledge, beliefs, and practices could remarkably change the attitude of individuals7. Hence, it is crucial to understand the situations in which mothers seek medical guidance for their children suffering from fever, the self-management strategies and measures they utilise, and from which perspective they struggle to manage febrile children[8].

Again, concerned caregivers typically seek reassurance from diverse sources, including family and social networks, books, magazines, and the internet, many of which may lack reliability. Paediatric nurses, primary care physicians, or general practitioners play a significant role as health educators and have the scope to offer clear instructions on the initial management of febrile children to reduce undue parental stress[5].

Surprisingly, a phenomenon termed 'fever phobia' has been expressed among physicians and nurses, raising unforeseen worries about fever management and fostering negative attitudes towards fever. Furthermore, various studies have identified incorrect and inconsistent knowledge about fever, non-evidence-based perspectives, and practices among physicians and nurses[9]. Hence, the sustained anxiety and dissatisfaction of parents may sometimes compel the primary care physician to practice irrational prescriptions of antipyretic combinations as well as different antibiotics. This could potentially result in a rise in hospital admissions, subsequently amplifying the burden and costs of the healthcare setup[10].

This issue may be more grievous in the healthcare context of Bangladesh, where there is a scarcity of adequate information, appropriate communication, and abundant resources. Therefore, the objective of this review was to assess the understanding level of parents and healthcare providers in different countries regarding fever, its management, and their perception of its consequences.

MATERIALS AND METHODS

Design:

This research comprised a systematic review of qualitative studies. PRISMA international standards and Cochrane recommendations were followed.

Search strategy:

A systematic literature search of the Medline, Cochrane Library, Google Scholar, SCOPUS, Web of Science, and PubMed databases was undertaken from July to December 2023 for qualitative studies published in English.

Search terms were-

a) Fever or febrile
b) Child or paediatrics
c) Antipyretic agent
d) Knowledge, attitude, belief, concern

Inclusion criteria:

Types of studies-

a) Original qualitative research examining parents'and healthcare providers' (Doctors and/or nurses) knowledge and perception of fever in children.
b) Discrete qualitative studies that form part of a larger mixed method study.
c) Articles written in English.

Types of clinical setting-

a) Hospital emergency departments.
b) Hospital inpatient and outpatient settings.
c) General practice surgeries/clinics.
d) Childcare facilities.

Types of participants-

Parents and professional healthcare providers of children

Exclusion criteria:

a) Research articles that only evaluate fever from a biological perspective and beyond children age group.
b) Articles about fever after vaccination.
c) Letters to the editor, comments from experts, and translations of original articles.
d) Grey literature (Theses, internal reports, non-peer reviewed journals).

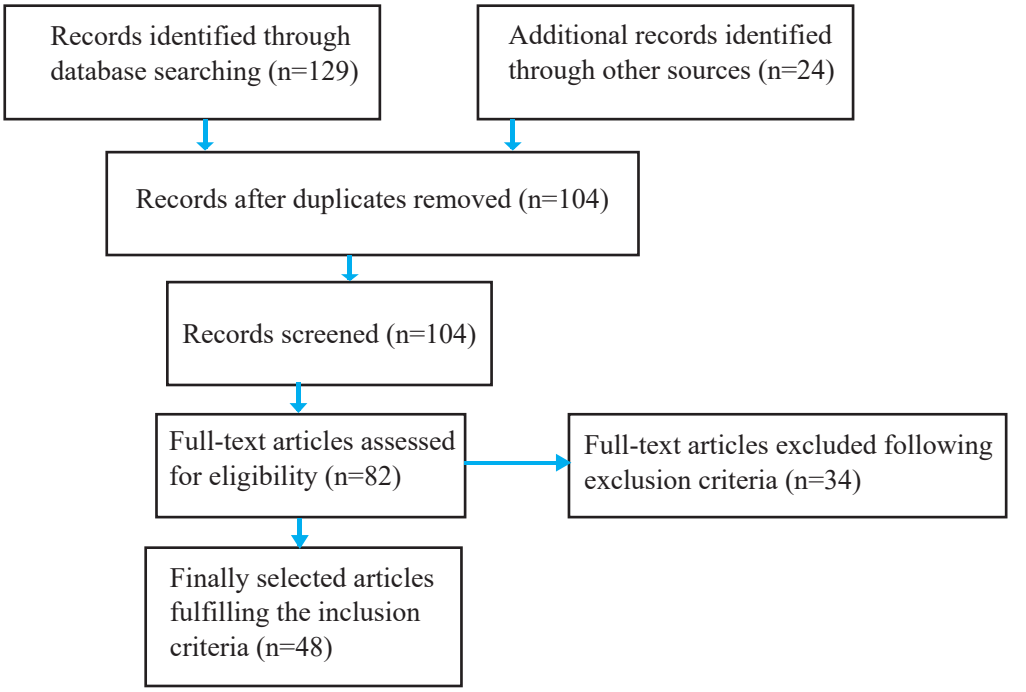

Figure-1: *PRISMA flowchart*[11].

e) Other unpublished sources.

Data extraction and management:

The thematic synthesis incorporated original studies or review articles that aligned with the reviewer's vision. All articles that met the inclusion criteria of the review were obtained in full text format, followed by further screening of full text journals by two independent reviewers. All disagreements were resolved through discussion until consensus was reached. Finally, a summary of each chosen study was reviewed in the third phase of selection to determine the outcome.

Search results:

The search was completed in December 2023, with 129 articles discovered in databases and 24 articles found using the "snowball" technique. After removing duplicates, there were 104 articles left. Among them, 82 papers were evaluated in full text for inclusion in the study. In addition, 34 papers were excluded following the exclusion criteria. Finally, 48 articles were derived. All of them were qualitative synthesises. This information is represented in PRISMA flowchart (Figure-1).

DISCUSSION

Basic concepts of fever

Defining fever

As per the textbook of paediatrics, fever is defined as a rectal temperature at or above 38°C (100.4°F), and a value >40°C (104°F) is called hyperpyrexia. Body temperature also varies throughout the day, with the highest in the early evening and the lowest in the morning[12].

Mechanism of fever

Fever is a primitive host survival mechanism. The neurons located in the anterior hypothalamus inherently possess characteristics for regulating body temperature. They purposefully elevate body temperature up to a predetermined limit, occasionally exceeding 40°C, seldom surpassing 41.1°C, and never beyond 42.2°C[13].

Three distinct mechanisms are responsible for producing fever. The initial process entails the fever response being initiated by endogenous pyrogens in response to exogenous pyrogens, primarily microorganisms or their derivatives, such as toxins. Endogenous pyrogens include Interleukins 1 and 6, Tumour Necrosis Factor (TNF), and Interferon (INF). These pyrogens stimulate the thermosensitive neurons in the hypothalamus, resulting in an ultimate elevation of the set point through prostaglandins. Malignancy and inflammatory diseases can also induce fever through the production of endogenous pyrogens. In salicylate poisoning and malignant hyperthermia, heat production exceeds heat loss, which is the second mechanism of fever production. In the third mechanism, there is a dysfunction in heat loss, as seen in conditions like ectodermal dysplasia or individuals subjected to severe heat exposure[12]. Typically, fever acts as a protective mechanism for the body until an imbalance arises between cytokines and their

inhibitors, leading to severe infections, along with septic shock[14].

Measuring temperature

The evidence suggests that electronic thermometers placed in the axilla, chemical dot thermometers in the axilla, and infrared tympanic thermometers are commonly practiced methods to measure body temperature in febrile children. Routine use of the oral and rectal routes to measure the body temperature of young children has been replaced by minimal contact (Tympanic) or noncontact infrared thermal scanners due to safety concerns and problems with acceptability. Healthcare professionals should be aware that axillary temperatures are typically 1°C lower than rectal or core temperatures[15].

Management of fever

The administration of antipyretic therapy remains a prevalent practice among parents and is generally endorsed by paediatricians. However, appropriate counselling of parents and other caregivers by health care providers regarding the use of antipyretics is the mainstay of managing febrile children. Therefore, health professionals should adhere to evidence-based practice. Primary care physicians and nurses actively treat fevers of 38.5°C or above with antipyretics. But, according to the current evidence, lowering the temperature should not be the primary objective of antipyretic therapy; rather, the overall comfort and well-being of the febrile child should be emphasized[16]. Current evidence suggests that in the majority of clinical scenarios, there is no significant distinction in the safety and efficacy of acetaminophen and ibuprofen for managing a febrile child. Moreover, some practitioners achieved better outcomes by combining these two products compared to using a single agent alone15. Evidence was found regarding the significant toxicity of paracetamol and ibuprofen in children with a febrile illness who are unwell, anorexic, vomiting, or dehydrated. Ibuprofen has some nephrotoxic effects other than common gastritis. Aspirin is not recommended to treat febrile children due to the potential risk of Reye's syndrome[17]. Considering these adverse drug effects and toxicity, physicians should prescribe medicines judiciously[16].

Similarly, traditional methods like cold baths or alcohol sponging for decreasing body temperature are discouraged due to the likelihood of causing discomfort where a child's comfort is our main focus[5]. Furthermore, healthcare providers occasionally overtreat febrile seizures, despite the lack of antipyretic in preventing febrile seizures. They should instead focus on monitoring for manifestations of serious illness, counselling on maintaining hydration, and the appropriate and limited use of antipyretics, only to improve the child's comfort in any sort of febrile illness. Paediatricians should also offer caregivers precise dosing instructions to prevent adverse effects. While counselling the parents, the health care providers should minimise fever phobia[16].

Fever phobia-current situation

The phrase "fever phobia" has been described as the unrealistic fears of parents about fever by different researchers[18]. Numerous cases of inadvertent over and under dosing with antipyretics have been reported each year, stemming from the belief that fever is harmful[19]. The febrile seizure remains the main focus of parents as well as many healthcare providers' concerns, who think that it is provoked by fever[17]. Hence, healthcare practitioners find themselves over-engaged due to futile consultations by anxious parents[20]. Often, parental ignorance and fear result in repeated consultations, sometimes with different physicians, within the same febrile illness episode[21].

Parents' knowledge of fever

According to Anokye and colleagues, the majority of parents don't have adequate knowledge about normal body temperature and they describe fever as the hotness of the body[22]. But, this finding is inconsistent with the findings of Al-Ateeq et al., where most of the parents identified fever correctly[23]. As for fever complications, the majority of parents mentioned that convulsion was the most common feared complication[24]. In contrast, Rkain et al. reported that brain damage followed by febrile episodes was the main concern of the majority of the parents, leading to seizures, paralysis, breathing difficulties, and coma[25]. The majority of fevers arise from acute viral febrile illnesses, generally characterised by a pronounced upstroke of temperature, without any localising signs. It may sometimes persist for 3 to 4 days and gradually resolve by 7 days. They are generally self-limiting, and adequate rest with maintenance of hydration, along with antipyretics, form the mainstay of therapy in this illness. However, it often leads to excessive fear on the part of the parents due to the lack of knowledge, compelling them to repeat consultations[26].

Methods for fever detection by parents

Villarejo-Rodríguez researched to observe the disparity in approaches to managing childhood fever between parents with healthcare backgrounds and those without. Most of the parents, irrespective of their medical knowledge stated that they relied on contact with the child's skin, for instance, kissing on the

forehead, for the detection of fever. On the other hand, some parents practiced using thermometers to measure temperature, and most of them preferred mercury thermometers over digital thermometers placed under the axilla[27].

Antipyretics and their use by parents in fever management

The knowledge of parents about normal body temperature, the effectiveness and appropriate dosing of antipyretics is questionable. In Barrett's study, most of the parents reported paracetamol as an influencer on a child's well-being, where prevention of febrile seizures and febrile convulsions was the main concern[28.] Administration of antipyretics in inappropriate doses, is widely prevalent among parents[29]. In another study, around 50% of febrile children received appropriate antipyretic doses before presentation at emergency departments[30].

A lot of discrepancies persist regarding the route of antipyretic administration. Certain investigations show that oral paracetamol is more effective than the rectal form, others found they had similar effects[31]. Again, the Italian Paediatric Society does not recommend rectal paracetamol because of the risk of overdose, as the calculation of a precise dosage is difficult to achieve in rectal administration. Therefore, the comparison of the route of administration of antipyretics, either rectal or oral, has conflicting results[31].

Traditional practice

Traditional practices related to the diagnosis and management of fever include; touching the child's forehead to measure body temperature, making ice-cold water for sponging or bathing, giving boiled herbs, and rubbing the child's body with lemon, vinegar, or alcohol, etc[32]. Traditional practices with the use of herbs, honey, oils, lubkha (Poultice), and uvula elevation were also practiced in some countries[33]. The utilization of herbs as a traditional practice has been considered a safer and more natural method compared to the pharmaceuticals documented in different studies[34]. According to Phukan and his colleagues, herbal medications like Tulsi, Manikmoni, and Neem are taken orally, and some other plants are used as a paste placed over the forehead for managing persistent fever in children[33]. Homoeopathic medicines and peppermint oil are also used as alternative medications. Parents, particularly those from rural backgrounds without formal health training, predominantly consider natural therapies. Nevertheless, health professionals reject these methods based on scientific evidence[28].

Factors influencing parental performance in managing fever

Cultural diversities and socioeconomic factors can influence attitudes and practices about fever in childhood. According to the researchers, inadequate parental knowledge and substandard caregiving practices for febrile children stem from incomplete education[34]. Contrary to the previous study, Alex-Hart, & Frank-Briggs reported that 66.2% of the mothers with tertiary education had a knowledge gap regarding fever[35]. A study conducted by Mallick showed that housewife mothers had a lack of knowledge in caring for their feverish children. Residents in rural areas face restricted access to health services and possess poor health literacy, resulting in an information gap[10]. In contrast, Abdinia et al. revealed that 83.7% of the less knowledgeable participants resided in urban areas[36]. Increased poverty and parental unemployment contribute to inadequate compliance, and limited utilisation of medical services, negatively impacting health[10]. Other factors that influence the parental approach to childhood fever are the age of the child, family pressures, a lack of health training programmes, and the presence of family support[28].

Perception of health professionals regarding fever

"Fever phobia" has been observed in nursing staff, as well as primary-care physicians with exaggerated concerns about fever due to varying levels of knowledge. Many physicians and nurses have a scarcity of knowledge regarding the definition of fever and the subsequent management, whereas health professionals are the primary sources of communication with parents[20]. Different global research studies since the early 2000s showed that febrile seizure is the main concern of more than 90% of health professionals, notably nurses and they practice non-evidence-based management for febrile children in fear of febrile seizure and brain damage[10]. In a study, Zubedeh described that most nurses (94%) had good knowledge about the antipyretic administration, while some nurses (37.3%) perceived that it was necessary to wake sleeping children with a temperature of 38.3°C or higher for the administration of an antipyretic and misconceptions about dose schedules also prevailed among nursing staff[37]. According to Al-Eissa, most paediatricians think that a sleeping febrile child should not be awakened for any reason, including medication[38]. Most of the physicians have adequate knowledge about the dosage and administration intervals of paracetamol (10-15

mg/kg/dose every 4-6 hours) which goes with the evidence of the recommended dose for paracetamol[27]. Health professional parents typically calculate dosage according to the child's weight and age, and most of the non-trained, non-professional parents administer medication using a blind guess. On the other hand, paracetamol or ibuprofen alone or in combination are choices among both health professional and non-health professional parents[28].

Hospital burden due to fever

According to Crocetti, 90% of paediatric hospital admissions occur due to fever, while the febrile episode becomes a nightmare for the parents[39]. Fever constitutes 30% of paediatric consultations at primary healthcare services in different countries, including Europe and the United States. The rate was higher (60%) in Spain[28]. Healthcare system costs and unnecessary testing for patients have been increased due to non-urgent visits to emergency departments without any benefit[5].

Significance of educational programs

Educational interventions can successfully improve the knowledge and attitude of parents, and these should be targeted to the particular demands of parents. Many educational programmes were developed, including the development of educational booklets, but there is no reported evaluation of their effectiveness[27,28]. Before arranging educational materials, parents' care-seeking perception, the therapeutic approach, and the expectations should be sought. These aspects can provide health professionals with key information for designing and implementing educational programmes for the improvement of parents dealing with their febrile child. Fever education should be integrated as a regular component of paediatric outpatient department services, with the help of posters, animated videos, pamphlets, and booklets. The guidelines should be trustworthy, easily accessible to the parents, and supported by information that caregivers have provided in previous studies. Evidence-based information should be prioritized[37]. Paramedics and nursing staff should also be taught about the use of appropriate antipyretics. Specific directives should be prepared regarding the use of antibiotics and antipyretics in an appropriate way.

Childhood fever: Bangladesh perspective

Childhood fever was discussed in different Bangladeshi studies. Nevertheless, very little information was discovered regarding the perception of parents and health professionals regarding febrile illness in children. Fever being the single most common reason for Bangladeshi children to visit medical practitioners and emergency departments, causes a huge burden. The prevalence of childhood fever was 33.1% in a Bangladeshi study. The prevalence was higher in male children between 13 to 24 months of age living in rural areas. The management of childhood illness is significantly influenced by maternal age and education, as literacy levels can impact awareness levels and the ability to access health information. The level of health communication and managing complications is diminished in the mothers who have a low level of schooling. In terms of the economy, household poverty significantly contributes to below-average living standards, limited access to quality healthcare, and consequently, heightened susceptibility to multiple diseases[40].

A nationwide analysis of febrile illness in children was done in our country, which revealed that a mass proportion of children suffer from enteric fever, followed by Ricketsia and dengue fever[41]. Since the World Health Organization declared COVID-19 a global pandemic on 11 March 2020, and Bangladesh underwent a countrywide lockdown from 26 March, the anxiety and concern of the parents reached the extreme when they experienced their children having fever. The combination of dengue fever and the COVID-19 crisis aggravated the already stretched health system of Bangladesh[42].

Najnin and colleagues found that mothers of young infants with febrile illness were more likely to be taken to the doctor compared to the age group of 4 to 5 years. The study additionally revealed that febrile children from economically disadvantaged families were least likely to seek care from professional healthcare providers; boys tended to be more frequently brought to the hospitals; and a decline in consciousness level prompted the caregivers to seek frequent medical assistance. The research also says that father's education is correlated with positive healthcare seeking practice, given their typical predominant role as the decision makers within the families of Bangladeshi society[43]. Despite living in the catchment areas of the hospitals even with the paediatric outpatient facilities, many Bangladeshi parents prefer visiting traditional care providers (Homeopaths/Kobiraj) initially for their febrile children, especially in rural settings[44]. Acute respiratory infections (ARIs), followed by gastroenteritis, account for the common febrile illnesses, where different viruses are identified as the leading cause. Therefore, Integrated Management of

Childhood Illness (IMCI) guidelines have been produced as a standard protocol to promote the rational use of antimicrobials. Hence, healthcare providers continue to prescribe antibiotics frequently to patients without specific indications[45]. Children of Bangladesh bear a large burden of typhoid fever, the treatment of which became difficult due to antimicrobial resistance followed by inappropriate use of antibiotics[46]. Contributing factors to the improper utilisation of antibiotics in febrile children include diagnostic ambiguity, insufficient expertise among medical professionals, easy dispensing opportunities without monitoring, and mostly the overconcern of anxious parents[47,48]. Quite interestingly, parents having better academic backgrounds were found to be more concerned about their children's health but lacked awareness of the effects of antibiotic use in different studies. Even receiving antibiotics from unqualified sources (Such as pharmacies and unqualified providers) is a common practice here[45,49]. An upgraded fever module may enhance the sensitivity of the guidelines in identifying children with bacteraemia and prevent overtreatment with antibiotics.

LIMITATIONS

The provided data outline the perspective of both parents and healthcare professionals regarding fever management in the paediatric population. Although the findings have been found in several studies conducted in different countries and cultures, very little information could be retrieved from our country. Therefore, the findings might not be generalized. Again, there might be the chance of potential bias as the samples were different in the published articles, for example, some involved emergency departments whereas some included OPD patients, and some studies were done only on parents and some on nursing staff. Nevertheless, the level of perception, attitudes, and practices could change over time; therefore, further research should be sought in the future.

CONCLUSION

Perception of childhood febrile illness is deficient in the majority of parents and there are instances where the knowledge, attitude, and practices of health professionals also diverge from evidence-based approaches. Incomplete knowledge and improper management of fever in children might lead to an unnecessary visit to the hospital and invite undue panic in parents. Various misconceptions prevail in the community even after easy access to digital media. Therefore, extensive education of health care workers and consistent information delivery play a pivotal role in providing comfort to anxious parents struggling with their febrile children.

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