Fever: A Literature Review of Perceptions, Perspectives and Practices

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Abstract

Previous and extant studies on home management of childhood fever among caregivers in most contexts have shown that the perceptions, perspectives and common practices associated with fever have not changed significantly. Generally, caregivers in all contexts are still managing childhood fever aggressively due to fever phobia. In particular, caregivers in resource poor countries such as sub-Saharan Africa still have cultural believes about fever which often underscores the pervasive hybrid of traditional and inadequate orthodox approaches to home management of fever. There is thus need for culturally sensitive and competent health literacy interventions to mitigate deleterious impacts of perceptions, perspectives and common practices related to home management of fever universally.

Keywords: Fever; Perceptions; Home management; Common practices

Introduction

Fever is body temperature exceeding what is considered normal for the site at which the measurement is taken. Fever is thus occurs when temperature in the rectum is above 38.0°C, temperature in the mouth is over 37.8°C, and temperature in the axilla exceeds 37.2°C. Fever may occur due to infection by microbes, being exposed to excessive heat in the environment heat or when engaged in strenuous physically demanding work [1-4]. Furthermore, recent studies have shown that global climate change resulting in global temperature rise can lead to increase in incidence of both communicable and non-communicable diseases and other symptoms including fever [5-10]. Fever is used by many in determining if an individual is in a healthy state or not, underlying the importance attached to it [1,3,4,11]. In children, fever is a most common presenting symptom of childhood diseases. Fever is a cause of great concern and anxiety among caregivers due to the various misconceptions attributed to it [1,2,3,13]. In caring for these children, a common practice among parents and caregivers is to commence treatment of the fever at home prior to presenting at a healthcare facility. This is seen especially in sub-Saharan Africa, Nigeria inclusive [14-19].

Perception of Fever

Historical perspectives

There are various beliefs and perceptions about fever. These beliefs and perceptions remain debatable. However, the fear and apprehension associated with fever by most mothers and caregivers remains irrefutable; thus the term ‘Fever Phobia’ was created [20,21]. Fever phobia results in parents and caregivers exhibiting an exaggerated anxiety and panic while regarding fever as the primary element of an illness or as the illness in and of itself in their wards and children [12]. The main cause of fever in Africa south of the Sahara in under-five children is malaria. The leading cause of morbidity and mortality due to fever in sub-Saharan Africa is Malaria. The currently documented case fatality rate of malaria in Nigeria is 31% [22]. In addition, fever due to malaria is one reason parents commonly present with their young children seeking medical care. Elevated body temperature may be an indication of serious illness. However in most of the cases, fever is the result of infectious diseases without any untoward consequences [13].

Historically, perspectives regarding treating fever symptomatically have changed significantly. Before mid-nineteenth century, fever was intentionally promoted because it was viewed as being a positive consequence of developing infections. However, this perspective morphed significantly to one of fever being considered harmful to health thus requiring treatment [23]. Currently in the twenty-first century, studies have revealed that fever serves as an immune mediator response to infections thus providing some beneficial effects and should be treated only when necessary [24-27].

In Nigeria, malaria and respiratory tract infections are the two common causes of fever in children [28]. The role parents play in the management of fever in their children can better be ascertained from their perceptions of fever and their comprehension of how to manage it. Historically, health seeking behaviors have been revealed to be impacted by several factors including: drug accessibility and availability, healthcare providers’ availability, treatment cost such as drugs, perception of disease severity, knowledge of disease etiology, diagnostic possibilities and ability to treat [17].

The work by Carl Wunderlich published in his magnum opus Das Verhalten der Eigenwärme in Krankheiten resulted in fever being viewed as a sign of disease and not a disease, thus dispelling existing wrong notions of fever at that time [29]. In the nineteenth century, Von Liebermeister hypothesized that temperature is regulated in the same way during health and illness but that fever arises in illness due to the body’s ‘thermostat’ being set higher. This notion is still currently relevant based on work done by Cranston [30].

Caregivers’ Perspectives

The perception among parents and caregivers about fever has been negative (Table 1). Most parents and caregivers believe that harmful outcomes result if fever is not treated irrespective of the severity of the fever [31,32]. The main concerns among caregivers due to unmanaged fever remain febrile convulsions, damage to the brain and...
Studies reporting perceptions and home management of childhood fever.

| State/Country          | Study Year | Study design          | Sample size | Perceptions (%) | Home management Practices (%) |
|------------------------|------------|-----------------------|-------------|-----------------|-------------------------------|
| U.S.A [20]             | 1980       | Cross-sectional (Survey) | 81 parents  | Fever harmful (52%) of parents | Administered antipyretics – (85% of parents) |
| Canada [45]            | 1984       | Cross-sectional (Survey) | 202 parents | Fever harmful (43% of caregivers) | Administered antipyretics – (53% of caregivers) |
| Togo [36]              | 1984       | Cross-sectional (Survey) | 507 mothers | N/A             | Administered antimalarial – (97% of mothers) |
| Saudi Arabia [34]      | 1986       | Cross-sectional (Survey) | 36 parents  | Fever harmful (37%) of parents | Administered antipyretics – (parents) |
| Canada [49]            | 1988       | Cross-sectional (Questionnaire) | 92 mothers | Fever harmful (49%) of mothers | Administered antipyretics – (55%) of mothers |
| United Kingdom         | 1997       | Cross-sectional (Questionnaire) | 392 parents | Fever harmful (81%) of parents | Administered antipyretics – (28.4%) of mothers |
| Italy48                | 1998       | Cross-sectional (Questionnaire) | 707 mothers | Fever harmful (65%) of mothers | Administered antipyretics – (48%) of mothers |
| Switzerland [53]       | 1998-2001  | Cross-sectional (Questionnaire) | 300 parents | Fever harmful (97%) of parents | Administered antipyretics – (67%) of parents |
| Maryland/ U.S.A [12]   | 1999       | Cross-sectional (29-item questionnaire) | 340 caregivers | Fever harmful (56%) of caregivers | Administered antipyretics – (58%) of caregiver |
| Israel [38]            | 1999       | Cross-sectional (Survey) | 650 parents | N/A             | Administered antipyretics – (96%) of parents |
| Saudi Arabia [41]      | 1999       | Cross-sectional (Questionnaire) | 560 parents | Fever harmful (95%) of parents | Administered antipyretics – (40%) of parents |
| Israel [4]             | 2000       | Cross-sectional (25-item questionnaire) | 2,059 physicians, nurses & parents | Fever harmful (56.9%) of parents | Administered antipyretics – (38.8%) of parents |
| U.S.A [52]             | 2000-2001  | Cross-sectional (Survey) | 474 parents | N/A             | Administered antipyretics – (39.5%) of parents |
| U.S.A [37]             | 2001       | Cross-sectional (Survey) | 138 caregivers | N/A             | Administered antipyretics – (86%) of caregivers |
| Alberta/ Canada33      | 2002       | Cross-sectional (Survey) | 209 parents | Fever harmful (100%) of parents | Administered antipyretics – (95%) of parents |
| United Arab Emirates [47] | 2005     | Cross-sectional (25-item questionnaire) | 264 caregivers | Fever harmful (82%) of caregivers | Administered antipyretics – (77%) of parents |
| Nigeria [15]           | 2006       | Cross-sectional (Survey) | 535 guardians | N/A | Administered antipyretics – (95.6%) of caregivers |
| Taiwan [46]            | 2013       | Cross-sectional (Survey) | 649 parents | Fever harmful (86.6%) of parents | Administered antipyretics – (87.7%) of parents |
| Nigeria [51]           | 2013       | Cross-sectional (Questionnaire) | 422 mothers | Fever harmful (82.7%) of mothers | Administered antipyretics – (87.5%) of mothers |
| Ireland [50]           | 2015-2016  | Cross-sectional (38-item questionnaire) | 1,104 parents | Fever harmful (60.4%) of parents | Administered antipyretics – (91.8%) of parents |

Note: “N/A” implies data not available

Table 1: Studies reporting perceptions and home management of childhood fever.

The ranking of these adverse effects of fever have however transformed with the passage of time. The 1980s revealed that parents were more preoccupied with brain damage as a consequence of fever (38% to 46%) than with febrile convulsions (15% to 39%) [20,34]. More recently, though fears about brain damage have remained relatively high (21% to 53%), anxiety over febrile convulsions have been significantly elevated (32% to 70%) [12,33]. Conversely, reports of relatively high (21% to 53%), anxiety over febrile convulsions have been significantly elevated (32% to 70%) [12,33]. In the 1980s however, antipyretics were routinely given to children at home before presentation at a healthcare facility (Table 1 below). Various studies have shown that fever reducing medications also known as antipyretics consistently remain the preferable method for managing fevers by many parents [37,38]. A comparison of studies conducted at different periods show that this practice of managing fever at home with antipyretics by parents increased from 67% in 1980 [20] to 95% in 2002 [33]. In the 1980s however, antipyretics were routinely given to children with temperatures in the normal range (67%) [20] and to those whose body temperatures were below 38.3°C (71%) [39]. In the 2000s, such practices witnessed a decline with only 23% of parents treating fevers.

Practices

The common practice among caregivers is for fever to be treated at home before presentation at a healthcare facility (Table 1 below). Various studies have shown that fever reducing medications also known as antipyretics consistently remain the preferable method for managing fevers by many parents [37,38]. A comparison of studies conducted at different periods show that this practice of managing fever at home with antipyretics by parents increased from 67% in 1980 [20] to 95% in 2002 [33]. In the 1980s however, antipyretics were routinely given to children with temperatures in the normal range (67%) [20] and to those whose body temperatures were below 38.3°C (71%) [39]. In the 2000s, such practices witnessed a decline with only 23% of parents treating fevers.
that were below 37.8°C with antipyretics [12]. Today, parents (46%) use antipyretics in a bid to promote their children’s wellbeing during febrile episodes [4]. Other fever management practices common during the 1980s comprised tepid, cold water or iced-cold water sponging or baths, and alcohol rubs [20,40]. Whereas tepid sponging remained a popular approach to managing fever in the early 2000s [12,33], cold water or iced-cold water sponging or baths and alcohol rubs were no longer often used during this period [33]. Parents usually combine tepid sponging with antipyretic administration as home treatment measures for fever [41,42]. It is important at this juncture to note that one common home fever management practice that has changed since an association was established between Reye’s Syndrome, aspirin use and influenza is administration of aspirin as an antipyretic medication. This practice is almost nonexistent as are the cases of Reye’s Syndrome [43]. In a study carried out by Oshikoya and Senbanjo in Nigeria in 2008, home treatment of fever was primarily performed by partially disrobing and exposing children to ambient air, tepid sponging them, and using antipyretics such as paracetamol. Antimalarial medications and antibiotics were rarely used [14]. This is in contrast to an earlier study in 2001 by Favole and Onadeko, also in Nigeria, which revealed that antimalarial medication would have been used by about 71 percent of mothers on their children at home for treatment of fever prior to reporting to healthcare facilities [18].

Furthermore, in Nigeria, the most common illnesses managed by alternative medicine practitioners also known as traditional healers is fever. The fever is often diagnosed based on clients providing an oral history of their symptom, the traditional healers performing a ‘physical examination’ then consulting oracles and when necessary interpreting dreams. Treatment is mainly with boiled herbs (“Agbo”), ground herbs (“Agunmu”), incisions and sacrifices [44].

Conclusion

From the foregoing, the perceptions, perspectives and common practices associated with home management of fever have not changed significantly among parents, caregivers and other care providers in twenty-first century sub-Saharan Africa. This may be due in part to enduring cultural beliefs and norms and inadequate continuing health literacy among caregivers and care providers. There is thus need for enduring cultural beliefs and norms and inadequate continuing health literacy interventions to mitigate deleterious impacts of perceptions, perspectives and common practices related to home management of fever in this part of the world [45-53].

References

1. El-Radhi ASM (2012) Fever management: Evidence vs current practice. World J Clin Pediatr 1: 29.
2. El-Radhi AS, Carroll J (1994) Fever in paediatric practice. Blackwell Scientific Publications.
3. Edwards H, Courtney M, Wilson J, Monaghan S, Walsh A (2001) Fever management practices: What pediatric nurses say. Nurs Health Sci 3: 119-130.
4. Sarrell M, Cohen H, Kahan E (2002) Physicians’, nurses’, and parents’ attitudes to and knowledge about fever in early childhood. Patient Educ Couns 46: 61-65.
5. Rossati A (2017) Global warming and its health impact. Int J Occup and Environ Health 23: 1-5.
6. Khormi HM, Kumar L (2016) Future malaria spatial pattern based on the potential global warming impact in South and Southeast Asia. Geospat Health 11: 416.
7. Franchini M, Mannucci PM (2015) Impact on human health of climate changes. European J Intern Med 26: 1-5.
8. Toan DTT, Kien VD, Giang KB, Minh HV, Wright P (2014) Perceptions of climate change and its impact on human health: An integrated quantitative and qualitative approach. Glob Health Action 7: 23025.
9. Caminade C, Kovats S, Rocklov J, Tompkins AM, Morse AP, et al. (2014) Impact of climate change on global malaria distribution. PNAS 111(9): 3286-3291.
10. Kabir MI, Rahman MB, Smith W, Lusha MAF, Azim S, et al. (2016) Knowledge and perception about climate change and human health: Findings from a baseline survey among vulnerable communities in Bangladesh. BMC Public Health 16: 266.
11. Blumenthal I (2000) Fever and the practice nurse: Management and treatment. Commun Pract 73: 519-521.
12. Crocetti M, Moghbili N, Serwint J (2001) Fever phobia revisited: have parental misconceptions about fever changed in 20 years? Pediatrics 107: 1241-1246.
13. Slater M, Krug S (1999) Evaluation of the infant with fever without source: an evidence based approach. Emerg Med Clin North Am 17: 97-126.
14. Oshikoya K, Senbanjo I (2008) Fever in children: Mothers’ perceptions and their home management. Iran J Pediatr 18: 229-236.
15. Ayaji IO, Falade CO (2006) Pre-hospital treatment of febrile illness in children attending the general outpatients clinic, University College Hospital, Ibadan, Nigeria. Afr J Med Sci 35: 85-91.
16. Salako LA, Brigger WR, Afolabi BM, Umeh RE, Agomo PU, et al. (2001) Treatment of childhood fevers and other illnesses in three rural Nigerian communities. J Trop Pediatr 47: 230-238.
17. Salako LA, Brigger WR, Agomo PU, Afolabi BM, Umeh RE (2001) Early and appropriate treatment of childhood fevers in Nigeria. Special Programme for Research and Training in Tropical Diseases, Final Report 41-61.
18. Favole OI, Onadeko MO (2001) Knowledge and home management of malaria fever by mothers and care givers of under five children. West Afr J Medicine 20: 152-157.
19. Nicoll A (2000) Integrated management of childhood illness in resource-poor countries: an initiative from the World Health Organization. Trans Royal Soc Trop Med Hyg 94: 9-11.
20. Schmitt B (1980) Fever phobia: misconceptions of parents about fevers.AMA J Dis Child 134: 176-181.
21. Knoebel E, Narang A, Ey J (2002) Fever: To treat or not to treat. Clin Pediatr 41: 9-16.
22. Gething PW, Casey DC, Weiss DJ, Bisanzio D, Bhatt S, et al. (2016) Mapping Plasmodium falciparum mortality in Africa between 1990 and 2015. NEJM 375: 2435-2445.
23. Holper DCA (2011) Fever: Enemy or Friend?-A comparison of the perception and management of childhood fever between parents in Germany, Luxembourg and the Netherlands. 1-227.
24. Sullivan JE, Farrar HC (2011) Fever and antipyretic use in children. Pediatrics 127: 580-587.
25. https://www.nhg.org/standaarden/volledig/nhg-standaard-kiinderen-med-koots
26. National Collaborating Centre for Women’s and Children’s Health United Kingdom (2013) Feverish illness in children: Assessment and initial management in children younger than 5 years.
27. Amengua D, Aurec-Leca E, Belegaud J, Biour M, Bourillo A, et al. (2005) Development on the management of fever in children. Paris: AFSSAPS 8: 39-43.
28. Sule SS (2003) Childhood morbidity and treatment pattern at the multipurpose health centre Ilesa, Nigeria. Niger J Med 12: 145-149.
29. Mackowiak PA, Warden G (1994) Carl Reinhold Wunderlich and the evolution of clinical thermometry. Clin Inf Dis 18: 458-467.
30. Cranston WI (1966) Temperature regulation. BMJ 2: 69-75.
31. Blattelis CM (2003) Fever: Pathological or physiological, injurious or beneficial? J Therm Biol 28: 1-13.
32. Mackowiak PA (2000) Diagnostic implications and clinical consequences of antipyretic therapy. Clin Infect Dis 31: S230-S233.
33. Karwowska A, Nijssen-Jordan C, Johnson D, Davies H (2002) Parental and health care provider understanding of childhood fever: A Canadian perspective. CJEM 4: 394-400.
34. Abdullah MA, Ashong EF, Al Habib SA, Karrar ZA, Al Jishi NM (1987) Fever in children: Diagnosis and management by nurses, medical students, doctors and parents. Ann Trop Paediatr 7: 194-199.
35. Ajayi IO, Falade CO (2006) Pre-hospital treatment of febrile illness in children attending the general out-patients clinic, University College Hospital, Ibadan, Nigeria. Afr J Med Med Sci 35: 85-91.
36. Deming M, Gayibor A, Murphy K, Jones TS, Karaa T (1989) The home treatment of febrile children with antimalarial drugs in Togo. Bull World Health Organ 67: 695-700.
37. McErlean MA, Bartfield JM, Kennedy DA, Gilman EA, Stram RL, et al. (2001) Home antipyretic use in children brought to the emergency department. Pediatr Emerg Care 17: 249-251.
38. Linder N, Sirotà L, Snapir A, Eisen I, Davidovitch N, et al. (1999) Parental knowledge of the treatment of fever in children. Isr Med Assoc J 1: 158-160.
39. Casey R, McMahon F, McCormick M, Pasquariello P, Zavod W, et al. (1984) Fever therapy: An educational intervention for parents. Pediatrics 73: 600-605.
40. Anderson AR (1988) Parental perception and management of school-age children’s fevers. Nurse Practitioner 5: 8-18.
41. Al-Eissa YA, Al-Sanie AM, Al-Alota SA, Al-Shalaan MA, Ghazal SS, et al. (2000) Parental perceptions of fever in children. Ann Saud Med 20: 202-205.
42. Al-Eissa YA, Al-Zamil FA, Al-Sanie AM, Al-Saloum AA, Al-Tuwaijri HM, et al. (2000b) Home management of fever in children: Rational or ritual? Int J Clin Pract 54: 138-142.
43. Cranswick N, Coghlan D (2000) Paracetamol efficacy and safety in children: The first 40 years. Am J Ther 7: 135-142.
44. Fawole OI, Akinboye DO, Falade CO, Arulogun OS, Adeniyi JD, et al. (2009) Case management of childhood fever by traditional healers in southwest Nigeria: Identification of training and collaborative needs. Int J Community Health Educ 28: 319-335.
45. Kramer MS, Naimark L, Leduc DG (1985) Parental fever phobia and its correlates. Pediatrics 75: 1110-1113.
46. Chang LC, Liu CC, Huang MC (2013) Parental knowledge, concerns, and management of childhood fever in Taiwan. J Nurs Res 21: 252-260.
47. Betz MG, Grunfeld AF (2006) Fever phobia in the emergency department: a survey of children’s caregivers. Eur J Emerg Med 13: 129-133.
48. Impicciatore P, Nannini S, Pandolfini C, Bonati M (1998) Mothers’ knowledge of, attitudes toward, and management of fever in preschool children in Italy. Prev Med 27: 268-273.
49. Stephenson MJ, Rosencrantz A, Kneller P (1988) Childhood fever: Parental beliefs and management. Canadian Family Physician 34: 63-66.
50. Kelly M, Sahm LJ, Shiely F, O’Sullivan R, de Bont EG, et al. (2017) Parental knowledge, attitudes and beliefs on fever: a cross-sectional study in Ireland. BMJ open 7: e015684.
51. Orimadegun AE, Ilesanmi KS (2015) Mothers’ understanding of childhood malaria and practices in rural communities of Ise-Orun, Nigeria: implications for malaria control. J Family Med Prim Care 4: 226-231.
52. Huang SY, Greenes DS (2004) Effect of recent antipyretic use on measured fever in the pediatric emergency department. Arch Pediatr Adolesc Med 158: 972-976.
53. Mendez-Gonzalez P (2004) Differences in perception and management of fever in children, by parents and health professionals (Doctoral dissertation, University of Geneva), Switzerland.