The validity and reliability of the Parent Fever Management Scale: a study from Palestine

Sa'ed H. Zyoud [#, 1, 2,3], PhD; Samah W. Al-Jabi [4], PhD; Masa M. Nabulsi[5], PharmD; Mais F. Tubaila[5], PharmD;Waleed M. Sweileh [2], PhD; Rahmat Awang[3], PharmD; & Anne Walsh [6], PhD

 # Corresponding Author: Sa'ed H. Zyoud, Poison Control and Drug Information Center (PCDIC), College of medicine and health sciences, An-Najah National University, Nablus, Palestine. e-mails: saedzyoud@yahoo.com,saedzyoud@najah.edu

[1] Poison Control and Drug Information Center (PCDIC), College of medicine and health sciences, An-Najah National University, Nablus, Palestine.
[2] Department of pharmacology and toxicology, College of medicine and health sciences, An-Najah National University, Nablus, Palestine.
[3] WHO Collaborating Centre for Drug Information, National Poison Centre, Universiti Sains Malaysia (USM), Penang, Malaysia.
[4] Department of clinical pharmacy and Pharmacotherapy, College of medicine and health sciences, An-Najah National University, Nablus, Palestine.
[5] PharmD program, College of medicine and health sciences, An-Najah National University, Nablus, Palestine.
[6] School of Nursing, Institute of Health and Biomedical Innovation, Queensland University of Technology, Brisbane, Queensland, Australia.

Running title: Parents' fever management

The validity and reliability of the Parent Fever Management Scale: a study from Palestine

Abstract

Background: Parental fever phobia and overuse of antipyretics to control fever is increasing. Little is known about childhood fever management among Arab parents. No scales to measure parents' fever management practices in Palestine are available.

Aims: The aims of this study were to translate and examine the psychometric properties of the Arabic version of the Parent Fever Management Scale (PFMS).

Methods: A standard "forward–backward" procedure was used to translate PFMS into Arabic language. It was then validated on a convenience sample of 402 parents between July and October 2012. Descriptive statistics were used, and instrument reliability was assessed for internal consistency using Cronbach's alpha coefficient. Validity was confirmed using convergent and known group validation.

Results: Applying the recommended scoring method, the median (interquartile range) score of the PFMS was 26 (23-30). Acceptable internal consistency was found (Cronbach's alpha = 0.733) and the test–retest reliability value was 0.92 ($P < 0.001$). **The chi-squared (χ^2) test showed a significant relationship between** PFMS **groups and frequent daily administration of antipyretic groups ($\chi^2 = 52.86$; $P < 0.001$). The** PFMS **sensitivity and specificity were 77.67% and 57.75%, respectively. The positive and negative predictive values were 67.89% and 32.11%, respectively.**

Conclusions: The findings of this validation study indicate that the Arabic version of the PFMS is a reliable and valid measure which can be used as a useful tool for health professionals to identify parents' fever management practices and thus provide targeted education to reduce the unnecessary burden of care they place on themselves when concerned for a febrile child.

Keywords: fever; antipyretics; fever management; children; parents; reliability; validity

Introduction

Fever is defined as a body temperature above the normal range: an oral temperature above 37.8 ºC, an axillary temperature above 37.2 ºC, and a rectal temperature above 38.0 ºC are all considered as fever [1]. However, fever may be the presenting feature of severe illnesses such as urinary tract infections, septicaemia and pneumonia. Fever can also be a consequence of medications, transfusions and allergies [2]. The care of a febrile child is one of the most common problems faced by parents and health professionals, in both hospitals and primary health care settings [3]. Parents also attempt to reduce fever to prevent febrile convulsions, brain damage and dehydration and, more recently, to prevent discomfort and improve general well-being [4-6]. Principi et al. [7] stated that parents of febrile children take time off work, seek medical advice, purchase pharmaceuticals and need more assistance at home. Furthermore, Walsh et al. [8] documented that childhood fever has a socio-economic, physical and emotional effect on parents.

Although many reports related to the care of a febrile child among different populations in the world have been published [1, 4-6, 8-17], none have been conducted in Palestine. Despite the fact that childhood fever management is receiving increasing attention regarding its prominent role in health care, little is known about Arab parents' childhood fever management. Additionally, there are no instruments available in the Arabic language to measure parents' fever management practices.

Recently, an seven-item self-reported scale, known as the Parent Fever Management Scale (PFMS), has been developed by Walsh et al. [8] in response to the lack of a tool to measure parents' fever management practices, as well as practices based on phobic beliefs. Fever phobia increases the physical and emotional burden on parents through continued temperature-taking as well as disturbed and sleepless nights, and could affect parents' practices [8, 18]. From an extensive literature review, PFMS appears to be valid, reliable and easy to apply for the assessment of parents' fever management

practices in Australia and Turkey [8, 9]. Adaptation of the PFMS to an Arab setting will not only allow Arab parents' fever management practices to be recognised, it will also allow comparisons of parents' fever management practices between different populations. The purpose of this paper is todocument some of the psychometric properties of the PFMS in a sample of Arab parents.

Methods

Study design and setting

A cross-sectional study design was used to address the research goals. The study was conducted in Nablus city with the surrounding camps and villages, with a population of 187839 in the city alone, and with a total population including Nablus city with the three camps and the surrounding villages of 340117. Around 47% of the population are children aged 0-17 years, while 28.1% are adults aged 18-35 years. The total number of families is 58750 and the average family size is 5.4 members. 15.9% of women and 67.4% of men a members of the workforce, with 12.9% of the population being unemployed [19].

Study setting

Study participants were recruited from the most populated areas. We collected data from two destinations: health care centres for children, where parents went periodically to vaccinate their children and therefore where we focused on dates when we would be able to recruit the required sample, and from Rafedia Governmental Hospital, where we focused on paediatric outpatient clinics. The inclusion criteria for our study were: parents aged 19-48 years, who had at least one child; aged between six months and six years, who were willing to participate, and who had given verbal consent to participate in the study.

Sample size

The mean monthly number of parents with children who attend the primary clinic in Nablus city is 39,400. This number was used as a guide to calculate the sample size needed for this study. By assuming a response rate of 50%, a confidence interval of 95% and 5% margin of error, the sample size calculator from an automated software program (http://www.raosoft.com/samplesize.html) was used. The minimum effective sample size estimated for the survey was 377. In order to minimise erroneous results and increase the study reliability, the target sample size was increased to 402 participants. Therefore, a convenience sample of 402 respondents was identified between July 2012 and October 2012.

Ethical approval

This study received approval from the Palestinian Ministry of Health and Institutional Review Board (IRB) at An-Najah National University. Verbal consent was also obtained from the parents prior to the commencement of the study.

Data collection form

Subjects were interviewed by use of a questionnaire, developed on the basis of other previous similar concepts [4, 8, 9]. A questionnaire was developed to obtain socio-demographic information, such as the respondent's age, gender, employment status, residency, number of children, income, years of education, and teaching and health care insurance coverage. Additional information included daily frequency of antipyretic administration [20]. This was combined with the Arabic version of the PFMS, originally developed by Walsh *et al.* [8]. This instrument explores parents' practices when their child is febrile on a five-point Likert scale (1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Mostly, 5 = Always) with a potential range of 8 to 40. Higher scores indicate more frequent or higher levels of these practices representing a higher parental burden when caring for a febrile child.A standard "forward–backward" procedure was used to translate the PFMS into the Arabic language according to international guidelines [21, 22].

Data collection procedure

Data collection was carried out by face-to-face interviews with the parents by principal investigators who were qualified clinical pharmacists. A total of 402 parents were eligible and were included in the final analysis. Regular evaluations took place throughout the abstraction period to identify any problems in data collection, interpretation of definitions, and application of study criteria. Before commencing data analysis, an extensive series of checks were performed for data consistency, proper sequences of data, and an evaluation of missing or incomplete data. The data collection form was modified by the principal researchers and the modified version was reviewed by experts to ensure content and construct validity.

Statistical analysis

Data were entered and analysed using the Statistical Package for Social Sciences (SPSS; SPSS Inc., Chicago, IL, USA) program version 15. Continuous data are presented as mean ± standard deviation (SD), and categorical data are expressed as

numbers with percentages. The chi-squared (χ^2) test was employed for categorical variables. Variables were assessed for normality using the Kolmogorov–Smirnov test. Inter-group differences in PFMS total score were assessed for statistical significance using either Mann–Whitney or Kruskal–Wallis tests for numerical data, as appropriate. Variables that were not normally distributed were expressed as median (interquartile range). Instrument reliability was assessed using the internal consistency approach; Cronbach's alpha coefficient was calculated to assess the degree of internal consistency and homogeneity between the items and Spearman's rank correlation was used to assess test–retest reliability. Item reliability was determined by test–retest (around three weeks) with ten parents. The criterion for accepting Cronbach's alpha was defined as a score above 0.6 [23]**.** Principal component analysis with varimax rotation was used to determine construct validity. The Kaiser–Meyer–Olkin (KMO) test was used to measure sample adequacy and Bartlett's test of sphericity (BS) was used to examine the correlation matrix. Known group validity was assessed through the association of PFMSscores with daily frequency of antipyretic administration using the Kruskal-Wallis test. Known group validity was also assessed by using the Spearman rank-order correlation coefficient, assuming that there was positive correlation between PFMS scores and dailyfrequency of antipyretic administration. The significance level was set at $p<0.05$. Dailyfrequency of antipyretic administration was considered to be the gold standard, and specificity, sensitivity and positive/negative predictive values were calculated for the reported PFMS scores to predict standard equations for good practice (accessed January 11, 2013, athttp://www.vassarstats.net/clin1.htm).

Results

Demographic data

A total of 402 completed questionnaires were evaluated. Table 1 shows the distribution of the socio-demographic characteristics of the parents who participated in the study. The parents had 1.3 ± 0.56 children aged under five years and 2.3 ± 2.0 children age over five years. Most of the participants were fathers (60%), had a village residency (86%), andwere educated to university level or higher(56.2%). Most of parents interviewed had family income equal to or less than 1000 Jordanian Dinars.

Parent Fever Management Scale

Fever management practices were reported by 402 parents as shown in Table 2. Parents always woke them up during the night for medications to reduce fever (46.5%), checked on them during the night (43.3%), liked to know what their temperature was (41.0%), slept in the same room as them (40.5%), and measured their temperature (36.3%). Other frequent responses included taking febrile children to a doctor (35.6%) and antipyretic use to reduce fever (24.4%). Scale scores ranged from 14 to 35 with a mean score of 26.5 ± 4.8. Higher scores indicate more frequent or higher levels of these practices representing a higher parental burden when concerned for a febrile child. PFMS scores are presented in Table 2. There were no significant differences reported when socio-demographic factors were taken into consideration (Table 1)

Reliability analysis

A test of internal consistency resulted in a Cronbach's alpha value of 0.733 for the seven items in the PFMS, which is within the recommended range [24]. The total-item correlation coefficient ranged from 0.22-0.63 (Table 3). Item 4 (antipyretic use to reduce fever) had the lowest total-item correlation while item 7 (waking febrile children to administer antipyretics during the night) had the highest. Total-item correlation coefficients were statistically significant ($P < 0.001$). The test-retest reliability of the seven-item PFMSindicates excellent reliability and stability of the instrument with a Spearman's rank correlation coefficient of 0.92 ($P < 0.001$).Item 4

(antipyretic use to reduce fever) had the lowest mean score (2.81 ± 1.3) and item 1 (checked on febrile child during the night) had the highest (4.06 ± 1.0).

Validity analyses

To ensure *content validity of the Arabic version*, the final Arabic language version of the instrument was examined by three experts in the field of clinical pharmacy and an academic expert in fundamental research. In accordance with their suggestions, minor changes were made to the original scale items (Table 2). The scale was then piloted using 10 parents (who were not included in the final analysis), and they found the instrument easy to understand.

Convergent validity was established through confirmatory factor analysis. Data were considered appropriate for factor analysis through a KMO measure of sampling adequacy value of 0.705 and a statistically significant result from Bartlett's test of sphericity ($\chi^2 = 732.861$; df = 21; $P < 0.001$). Pearson's correlation coefficient matrix for the seven PFMS items is shown in Table 4. All items have significant positive correlation coefficients. PFMS items in the unrotated principal component analysis ranged in value from 0.35 (item 4: used antipyretics to reduce fever) to 0.76 (item 7: waking febrile children for an antipyretic during the night). Item communalities ranged in value from 0.41 (item 6: took febrile children to a doctor) to 0.73 (item 2: liked to know what their temperature was). All items showed positive, nontrivial loadings on the first unrotated principal component. Thus, all factors in the measurement model had adequate reliability and convergent validity.

For the *known group validity*, the Kruskal-Wallis test was used to compare the PFMSscores with daily frequency of antipyretic administration. The median (interquartile range) PFMS score was 23 (20-26) for parents who administered antipyretics once daily and 29 (28-32) for parents who administered antipyretics six times daily. Overall, an increasing trend in the daily frequency of antipyretic administration ($P < 0.001$) was observed as the PFMS scores increased. The

Spearman rank-order correlation coefficient between daily frequency of antipyretic administration and total PFMS score was 0.415 ($P < 0.001$), indicating a medium positive association between PFMS score and dailyfrequency of antipyretic administration.

To ensure *construct validity* and to determine how well the PFMS performed in identifying parents with more frequent daily administration of antipyretics and in providing information in clinical practice, *sensitivity and specificity* were evaluated. For the sensitivity and specificity analysis, parents were divided into two groups: a high practice group with a PFMS total score ≥ median, and a low practice group with a PFMS total score < median. Parents were also divided into two groups according to daily frequency of antipyretic administration: a more frequent group withdaily frequency of antipyretic administration ≥ median, and a less frequent group with daily frequency of antipyretic administration < median. As shown in Table 5, the PFMSsensitivity and specificity were 77.67% and 57.75%, respectively. The positive and negative predictive values were 67.89% and 32.11%, respectively. The chi-squared (χ^2) test showed a significant relationship betweenPFMS groups and frequent daily administration of antipyretic groups ($\chi^2 = 52.86$; $P < 0.001$).

Discussion

The main objective of this study was to report the reliability and validity of the Arabic version of the PFMS in a sample of Arab parents. This study is the first to systematically translate and validate the seven-item PFMS into the Arabic language. Only one study has previously evaluated the PFMS forchildhood fever management among parents in Turkey [9]. The original seven-item PFMS was tested by Walsh et al. [8] among parents in Australia, and it was found that the scale was reliable with good validity. Our sample of parents was larger than the sample used in the Turkish study and close to the parental sample size of the Australian study. This might explain

the differences between studies in terms of the Cronbach's alpha values as the internal consistency is actually a correlation coefficient and the sample size can affect the results [25]. A Cronbach's alpha value of 0.7 or higher is generally considered as sufficient to demonstrate internal consistency. According to Walsh et al. [8] in the original developed scale, the PFMS has acceptable internal consistency, with a reported Cronbach's alpha coefficient of 0.70. In the current study, the Cronbach's alpha coefficient was 0.733. Total-item correlation coefficients were statistically significant ($P < 0{\cdot}001$). Therefore, we may conclude that the PFMS was acceptable and appropriate for evaluating the fever management practice of parents in Palestine and the Arab world.

Confirmatory factor analysis was appropriate for the current study to decide whether the seven-item PFMS correctly measured the construct of parents' burden of care when caring for a febrile child [26, 27]. There are two main issues to consider in determining whether a particular data set is suitable for factor analysis: sample size, and the strength of the relationship among the items. Sample adequacy is an important issue when conducting a factor analysis. The general recommendation is that a larger sample size is considered to be better. In small samples, the correlation coefficients among the variables are less reliable, tending to vary from sample to sample. Factors obtained from small data sets do not generalise as well as those derived from larger samples [26]. Tabachnick and Fidell [27] suggest that "it is comforting to have at least 300 cases for factor analysis".

The second issue to be addressed concerns the strength of the inter-correlations among the items. Tabachnick and Fidell [27] recommend an inspection of the correlation matrix for evidence of coefficients greater than 0.3. If few correlations above this level are found, then factor analysis may not be appropriate. Two statistical measures are also generated by SPSS to help assess the factorability of the data: Bartlett's test of sphericity, and the KMO measure of sampling adequacy [26]. The BS test value should be significant ($P < 0.05$) for factor analysis to be considered as

appropriate. The KMO index ranges from 0 to 1, with 0.6 suggested as the minimum value for conducting factor analysis [27]. In our study, the KMO measure of sampling adequacy was found to be 0.705 with a statistically significant BS ($\chi^2 = 732.861$; df = 21, $P < 0.001$) and therefore the data were suitable for factor analysis. The PFMS was developed and initially tested for validity and reliability in an Australian population [8]. In our study, the PFMS mean item score was 26 ± 4.8 (possible range seven to 35); each item had a potential range of one to five. In the Australian study, the mean PFMS item score was 17.20 ± 4.44. The correlation coefficients of the items had positive, moderate to strong correlations between variables, ranging from 0.10 to 0.63. When the correlations between the items and total scores for the scale were analysed, they were found to be statistically significant ($P < 0.001$). All items confirmed a fair to strong correlation with the total score.

The known group comparison analysis indicated that the Arabic version of the PFMS is a valid instrument for measuring parents' fever management practices because the instrument was able to differentiate between parents according to daily frequency of antipyretic administration. Overall, an increasing trend in the daily frequency of antipyretic administration ($P < 0.001$) was observed as the PFMS score increased. The Spearman rank-order correlation coefficient between daily frequency of antipyretic administration and total PFMS score was 0.415 ($P < 0.001$), indicating a medium positive association between PFMS score and dailyfrequency of antipyretic administration.

This finding is accepted, as those parents with higher PFMS scores report more frequent antipyretic use for controlling fever in their child and self-management processes. Enhancement and improvement of parents' practices may lead to an improvement in their rate of antipyretic misuse or risk of overdose. A significant relationship was found betweenPFMS score and frequent daily administration of antipyretics ($\chi^2 = 52.86$; $P < 0.001$), with sensitivity and specificity of 77.67% and 57.75%, respectively. Our results are consistent with the suggested criteria for

construct validity of Terwee and colleagues [28], who recommend that when a specific a hypothesis is formulated, at least 75% of the results should be in accordance with the assumed hypothesis.

Conclusions and recommendations

The findings of this validation study indicate that the Arabic version of the PFMS is a reliable and valid measure which can be used as a useful tool for health professionals to identify parents' fever management practices and thus provide targeted education to reduce the unnecessary burden of care they place on themselves when concerned for a febrile child.As Walsh et al. [8] recommended, further research is needed to determine whether parents' knowledge, perceptions and beliefs about fever change when their child is well or febrile, and to investigate the resulting influences on changes in fever management and practices over time. Other areas for further study include the influence of education on the management of febrile convulsions, and implementation of evidence-based fever management guidelines on parents' practices.

Acknowledgements

We are grateful to Anne Walsh, Helen Edwards and Jenny Fraser (Parents' childhood fever management: community survey and instrument development. Journal of Advanced Nursing 2008; 63(4), 376–388) for permission to use the questionnaire for our study.

Conflict of interest: We would like to declare that there was no conflict of interests in conducting this study.

References

1. Jalil H, Jumah NA, Al-Baghli AA (2007)**Mothers' Knowledge, Fears and Self-Management of Fever: A Cross Sectional Study from the Capital Governorate in Kuwait**. *Kwt Med J***39**(4):349-354.
2. BMJ Group (2008) **When the child has a fever**. *Drug Ther Bull* **46**(3):17-20.
3. El-Radhi ASM (2008) **Why is the evidence not affecting the practice of fever management?** *Arch Dis Child***93**(11):918-920.
4. Chiappini E, Parretti A, Becherucci P, Pierattelli M, Bonsignori F, Galli L, de Martino M (2012) **Parental and medical knowledge and management of fever in Italian pre-school children**. *BMC Pediatr*, **12**:97.
5. Sakai R, Niijima S, Marui E (2009)**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*, **25**(4):231-237.
6. Walsh A, Edwards H, Fraser J (2007)**Influences on parents' fever management: beliefs, experiences and information sources**. *J Clin Nurs*,**16**(12):2331-2340.
7. Principi N, Esposito S, Gasparini R, Marchisio P, Crovari P (2004) **Burden of influenza in healthy children and their households**. *Arch Dis Child*,**89**(11):1002-1007.
8. Walsh A, Edwards H, Fraser J (2008)**Parents' childhood fever management: community survey and instrument development**. *J Adv Nurs*,**63**(4):376-388.
9. Altun İ, Cınar ND, Walsh A (2011)**Psychometric properties of the parents' fever management scale in a Turkish population**. *HealthMED*:567-575.
10. Nijman RG, Oostenbrink R, Dons EM, Bouwhuis CB, Moll HA (2010)**Parental fever attitude and management: influence of parental ethnicity and child's age**. *Pediatr Emerg Care*, **26**(5):339-342.
11. Cohee LM, Crocetti MT, Serwint JR,Sabath B, Kapoor S (2010) **Ethnic differences in parental perceptions and management of childhood fever**.*Clin Pediatr (Phila)*, **49**(3):221-227.
12. Crocetti M, Sabath B, Cranmer L, Gubser S, Dooley D (2009) **Knowledge and management of fever among Latino parents**. *Clin Pediatr (Phila)*,**48**(2):183-189.
13. Edwards H, Walsh A, Courtney M, Monaghan S, Wilson J, Young J (2007)**Promoting evidence-based childhood fever management through a peer education programme based on the theory of planned behaviour**. *J Clin Nurs*, **16**(10):1966-1979.
14. Boivin JM, Weber F, Fay R, Monin P (2007) **Management of paediatric fever: is parents' skill appropriate?***Arch Pediatr*, **14**(4):322-329.
15. Rodriguez Serna A, Astobiza Beobide E, Gonzalez Balenciaga M, Azkunaga Santibanez B, Benito Fernandez J, Mintegi Raso S (2006) **Change in habits among the population in the management of childhood fever**. *An Pediatr (Barc)*, **64**(5):497-498.
16. Madsen KA, Bennett JE, Downs SM (2006)**The role of parental preferences in the management of fever without source among 3- to 36-month-old children: a decision analysis**.*Pediatrics*, **117**(4):1067-1076.

17. Kemble SK, Davis JC, Nalugwa T, Njama-Meya D, Hopkins H, Dorsey G, Staedke SG (2006) **Prevention and treatment strategies used for the community management of childhood fever in Kampala, Uganda**. *Am J Trop Med Hyg* **74**(6):999-1007.
18. Lagerlov P, Helseth S, Holager T (2003)**Childhood illnesses and the use of paracetamol (acetaminophen): a qualitative study of parents' management of common childhood illnesses**. *Fam Pract* **20**(6):717-723.
19. Palestinian Central Bureau of Statistics:*West Bank Northern Governorates Statistical Yearbook, 2011*. Ramallah - Palestine.; 2012.
20. Zyoud SH, Al-Jabi SW, Sweileh WM, Nabulsi MM, Tubaila MF, Awang R, Sawalha AF (2013) **Beliefs and practices regarding childhood fever among parents: a cross-sectional study from Palestine**. *BMC Pediatr*,**13**:66.
21. Guillemin F, Bombardier C, Beaton D (1993) **Cross-cultural adaptation of health-related quality of life measures: literature review and proposed guidelines**. *J Clin Epidemiol*,**46**(12):1417-1432.
22. Wild D, Grove A, Martin M, Eremenco S, McElroy S, Verjee-Lorenz A, Erikson P (2005) **Principles of Good Practice for the Translation and Cultural Adaptation Process for Patient-Reported Outcomes (PRO) Measures: report of the ISPOR Task Force for Translation and Cultural Adaptation**. *Value Health* **8**(2):94-104.
23. Bowling A: *Research methods in health: investigating health and health services*. Buckingham: Open University Press; 2009.
24. Nunnally JC, Bernstein IH **Psychometric theory. 1994**. *McGraw, New York*.
25. Dawson B: **Methods of evidence-based medicine and decision analysis–In: Dawson B, Trapp RG. Basic & clinical biostatistics**. New York: Lange Medical Books/McGraw-Hill; 2004.
26. Pallant J: *SPSS survival manual: A step by step guide to data analysis using SPSS*: Open University Press; 2010.
27. Tabachnick B, Fidell L: *Principal components and factor analysis. In: Using multivariate statistics*. Boston,: Allyn & Bacon; 2001.
28. Terwee CB, Bot SD, de Boer MR, van der Windt DA, Knol DL, Dekker J, Bouter LM, de Vet HC (2007) **Quality criteria were proposed for measurement properties of health status questionnaires**. *J Clin Epidemiol*,**60**(1):34-42.

Table 1 Socio-demographic characteristics of the study respondents with differences in Parent Fever Management Scale total scores (N = 402)

Variable	Item	Frequency (%) N= 402	Median (Interquartile range)	*P* value
Gender	Male	241 (60.0)	26 (23-30)	0.352[a]
	Female	161 (40.0)	26 (23-30)	
Children aged less than five years	0	3 (0.7)	26 (25-26)	0.635[b]
	1	304 (75.6)	26 (23-30)	
	2	75 (18.7)	25 (23-30)	
	3	20 (5.0)	28 (24-32)	
Children aged more than five years	0	104 (25.9)	25 (23-31)	0.255 [b]
	1	59 (14.7)	25 (23-28)	
	2	59 (14.7)	27 (24-31)	
	3	67 (16.7)	26 (23-30)	
	4	55 (13.7)	27 (24-31)	
	≥5	58 (14.4)	26 (23-30)	
Health insurance	Governmental insurance	163 (40.6)	26 (24-30)	0.352 [b]
	Private insurance	56 (13.9)	25 (23-31)	
	Both	13 (3.2)	26 (25-32)	
	Do not have one	170 (42.3)	26 (23-30)	
Father's educational level	Elementary school (primary)	23 (5.7)	26 (24-30)	0.859 [b]
	Middle school (junior high school)	42 (10.4)	25 (23-31)	
	High school (secondary school)	112 (27.9)	26 (25-32)	
	University	225 (56.0)	26 (23-30)	
Mother's educational level	Elementary school (primary)	17 (4.2)	28 (23-30)	0.892 [b]
	Middle school (junior high school)	44 (10.9)	25 (23-30)	
	High school (secondary school)	133 (33.1)	26 (24-30)	
	University	208 (51.8)	26 (23-30)	
Employment status	Both works	108 (26.8)	25 (23-31)	0.750 [b]
	One of them works	278 (69.2)	26 (23-30)	
	Neither works	16 (4.0)	26 (23-30)	
Income level of the family [c]	Low (less than 500 JD)	89 (22.1)	25 (23-29)	0.050 [b]
	Average (500-1000 JD)	225 (56.0)	26 (24-30)	
	High (1001-3000 JD)	78 (19.4)	27 (23-32)	
	Very high (more than	10 (2.5)	26 (23-30)	

	3000 JD)			
Residency	City	346 (86.0)	26 (23-31)	0.664 [b]
	Village	40 (10.0)	26 (23-31)	
	Palestinian refugee camps	16 (4.0)	24 (19-31)	

[a] Statistical significance of differences calculated with the Mann-Whitney U test.
[b] Statistical significance of differences calculated with the Kruskal-Wallis test.
[c] 1 Jordanian Dinar equals 1.41 US Dollars

Table 2 Parent Fever Management Scale

When my child has a fever I generally:	**Never n (%)**	**Rarely n (%)**	**Sometimes n (%)**	**Usually n (%)**	**Always n (%)**
Check on them during the night	10 (2.5)	8 (2)	104 (25.9)	106 (26.4)	**174 (43.3)**
Like to know what their temperature is	6 (1.5)	19 (4.7)	102 (25.4)	104 (25.9)	**185 (41.0)**
Take their temperature	6 (1.5)	24 (6)	94 (23.4)	132 (32.8)	**146 (36.3)**
Use over-the-counter medication to reduce fever	86 (21.4)	82 (20.4)	**98 (24.4)**	94 (23.4)	42 (10.4)
Sleep in the same room as them	34 (8.5)	35 (8.7)	61 (15.2)	109 (27.1)	**163 (40.5)**
Take them to the doctor	10 (2.5)	31 (7.7)	95 (23.6)	**143 (35.6)**	123 (30.6)
Wake them up during the night for medications to reduce fever	-	25 (6.2)	126 (31.3)	64 (15.9)	**187 (46.5)**

Scale adapted from Walsh et al. 2008 [8]

Table 3 Reliability test of the seven-item Parent Fever Management Scale

Items [a]	Mean ± SD [b]	Corrected item– total correlation	Cronbach's alpha if item deleted [c]
Check on them during the night	4.06 ± 1.00	0.46	0.7
Like to know what their temperature is	3.97 ± 1.06	0.54	0.68
Take their temperature	3.97 ± 0.99	0.58	0.67
Use over-the-counter medication to reduce fever	2.81 ± 1.30	0.22	0.76
Sleep in the same room as them	3.83 ± 1.28	0.37	0.72
Take them to the doctor	3.84 ± 1.03	0.42	0.71
Wake them up during the night for medications to reducefever	4.03 ± 1.01	0.63	0.66

[a] Scale adapted from Walsh et al. 2008 [8]

[b] PFMS mean: 26.5 ± 4.8, range 14 to 35; potential range 7 to 35

[c] Cronbach's alpha = 0.733 for the total scale with significant intra-class correlation coefficient ($p < 0.001$).

Table 4 Correlation matrix and principal component analysis for the seven-item Parent Fever Management Scale

Item [a]	**Q1**	**Q2**	**Q3**	**Q4**	**Q5**	**Q6**	**Q7**	**Communalities**	**Unrotated principal component**
Check on them during the night	**1.00**							0.55	0.64
Like to know what their temperature is	0.26	**1.00**						0.73	0.72
Take their temperature	0.26	0.63	**1.00**					0.66	0.76
Use over-the-counter medication to reduce fever	0.15	0.12	0.15	**1.00**				0.43	0.35
Sleep in the same room as them	0.22	0.45	0.31	0.10	**1.00**			0.51	0.55
Take them to the doctor	0.38	0.22	0.46	0.10	0.16	**1.00**		0.41	0.62
Wake them up during the night for medications to reduce fever	0.55	0.37	0.41	0.35	0.29	0.38	**1.00**	0.71	0.76

[a] Scale adapted from Walsh et al. 2008 [8]

Table 5 The relationship between PFMSscores and daily frequency of antipyretic administration groups

Variable	**High practice ≥ median** [a] **n=215**	**Low practice < median** [a] **n=187**	***P* value**
More frequent ≥ median [b]	167 (77.7)	79 (42.2)	0.000 [c]
Less frequent < median [b]	48(22.3)	108(57.8)	

[a] Median (interquartile range) PFMS score: 26 (23-30)
[b] Median (interquartile range) score of daily frequency of antipyretics administration: 3 (2-4)
[c] Statistical significance of differences calculated using the chi-squared test