Mansoura Nursing Journal (MNJ)

vol.4 No.1 - 2017

DEVELOPING NURSING CARE GUIDELINE TO IMPROVE MOTHERS' PRACTICAL KNOWLEDGE IN CARING FOR THEIR FEVERISH CHILDREN

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Abstract

Background: Despite the fact that fever, changed into considered as a protective response for lots of decades and changed into even induced through doctors to fight certain infections, the using of antipyretic drugs has led to the common perception that fever is maladaptive and harmful. Parents have several misconceptions and beliefs about fever. Parents' fever phobia lead to inappropriate treatment of childhood fever. Parents' scores of the dangerous effects of fever have modified from past to present, even though their fundamental worries continue to be brain damage, febrile convulsions and death. **This study aimed to** develop nursing care guidelines to improve mothers' practical knowledge in caring for their feverish children. **Research design:** a quasi-experimental research design was conducted in inpatient and outpatient departments of Mansoura University Children's Hospital to achieve the steady aim. **Subjects:** a purposive sample of 100 mothers who were attending the previously mentioned two settings were selected. **The results of this study revealed that,** there has been a statistical improvement in mothers' knowledge pre implementation of care guideline, immediately after and follow up 40%, 100% & 100%, respectively, and mothers' practices 47%, 100% &99% respectively in caring for their feverish children. **The study concluded that,** there was a positive impact of care guideline on improvement of mothers' practical knowledge in caring for their feverish children. **The study recommended** availability of guidelines (a handbook) of fever and its management as a source to all mothers in the hospitals.

***Key words**: Fever, Knowledge, Mothers' practice, Fever guideline*

Introduction:

Fever is an everyday reaction to a set of situations, the most common is infection. It takes place when the body's temperature is high because of the body's thermostat being reset to a higher than common temperature **(Ward, Edwards &Torchia, 2015) (1)**. Fever is a common cause to seek medical a device **(Chiappini et al., 2012) (2).** Also, it is a common complaint in hospitalized children and a common trouble in both the patient ward and the intensive care unit (ICU) **(Serrano, 2012) (3)**.

The predominant causes of fever in children may be widespread categorized as infectious and noninfectious fevers , infectious fevers; are because of bacterial, viral, fungal, and protozoal infections which include the common cold, urinary tract infections, meningitis, malaria, gastroenteritis, croup, bronchiolitis, ear infections and appendicitis, while noninfectious causes of fever; are dehydration, injury, vasculitis, cancer and side effects of drug **(Hasan et al., 2012 ; Princeton University Press, 2015) (4 & 5)** . Fever is one of the maximum common clinical symptoms and signs. It is a part of approximately 30% of health care visits by children **(Sullivan & Farrar, 2011; Adrienne, 2015) (6 & 7)**. Emergency management of pediatric patients with

fever account for as many as 20% of pediatric Emergency Department (ED) visits and the underlying disturbances in these cases ranges from mild conditions to the maximum severity of bacterial and viral illnesses **(Selent et al., 2013; Muth, Statler, Gentile & Hagle, 2013) (8 & 9)**.

Most parents worry about the effect of fever on the brain as they think that it leads to mind damage and death. Parental training decreased worry and false impression of fever, promoted suitable measures for the fever **(Ravanipour, Sherafat & Gissou, 2014) (10)**. Lack of information between mothers about fever, and experience of inconsistencies within the technique of different healthcare experts can also result in mom's frustration, uncertainty, dissatisfaction with care and wrong assumptions about fever in children. Furthermore, those impacts in mixture with a high consultation and reconciliation rate increase health care charges and pressure pointless antibiotic use **(Cohee, Crocetti, Serwint, Sabath & Kapoor, 2010; Nijman, Oostenbrin, Dons, Bouwhuis & Moll, 2010) (11&12)**. Therefore, it's important to recognize why and when mothers in reality seek advice for their feverish children, what self-control activities they practice, and which facts, gaps they experience, to better target records at dad and mom both inside the session as well as out of doors acute care **(Giacaman et al., 2009) (13)**.

There are many of the myths and facts about fever as; Fever is an illness, but in fact fever is not an illness, but a sign of illness and a good sign to boot . Teething causes fever, but in fact a child's temperature will spike just before and during the time the tooth breaks through the gums However, a high or persistent fever during teething is not normal it is a sign that the child may be ill for a cause unrelated to teething . Fevers can cause brain damage; many people think that a high fever can damage the brain and other organs, although this can occur at very high body temperatures, the small rise in temperature brought on by fever do not lead to damage **(Schmitt, 2013) (14)**.

Significance of the study:

Fever incidence increases between the ages of 2 months to 3 years of child's life. This may be attributed to immunization, higher liability to communicable diseases in this age, especially in developing countries, including Egypt, frequent exposures of infants and younger children to attacks of gastroenteritis caused by teething and respiratory infections, and attending day-care centers or nurseries. Fever may be very regularly reported as the first sign of sepsis and systemic inflammatory reaction syndrome, both of which can be life threatening **(Saker, Mishra &Garge, 2012) (15)**.

The aim of this study was to:

Develop nursing care guideline to improve mothers' practical knowledge in caring for their feverish children.

Research hypothesis

- Mothers will have better knowledge about fever and its management after implementation of the care guideline than before its implementation.
- Mothers' practices of fever and its management, will be improved after the implementation of the care guideline than before its implementation.

Subjects and Method:

Research Design*:*

A quasi-experimental design was utilized in carrying out the study.

Setting:

The study was conducted in inpatient and outpatient departments of Mansoura University Children's Hospital (MUCH), Mansoura city.

Subjects:

A purposive sample of 100 mothers who were attending the previously mentioned two settings were recruited after meeting the following criteria:

1. Can read and write.
2. Having a child (both genders) between 2 months to 3 years old suffering from fever regardless the main diagnosis.
3. Available throughout the period of data collection.

Mothers with the following criteria were excluded from the study:

- Refuse to participate in the study
- Having feverish children under 2 months or over 3 years

Tools of Data Collection:

Data were collected through the following tools:

Tool I: A Structured Questionnaire Sheet:

It was developed by **Zyoud et al. (2013) (16)**, adopted and translated into Arabic language by the researcher to assess mothers' practical knowledge in caring for their feverish children. It was divided into:

Part 1:

It was concerned with a) Socio-demographic characteristics of the studied mothers; including age, level of education, residence, current marital status, job, number of children and type of health insurance, b) Characteristics of their feverish children, such as age, sex, birth order and frequency of exposure to fever attacks.

Part 2:

It was concerned with mothers' knowledge about fever and its management. It was covered the following items: Definition of fever, common causes of fever among children, risk factors, signs and symptoms of fever ,prevention and management and complications

Tool II: Observational Checklists (pre and post-test):

It consisted of three checklists that was designed by the researchers, to assess mothers' practices related to care for their feverish children before and after implementation of the guideline. They were covered the following items: measuring body temperature (under axle and rectally), apply tepid water compresses and administration of antipyretics and remedies used in addition to drugs (dropper method and suppository).

Operational design.

Preparatory phase:

This phase included a review of the past and current related literature and studies, using available books, periodicals, magazines and articles to get acquainted with the various aspects of the study research problem and develop the study tool. The guiding booklet was prepared by the researchers. It was specially designed in a simple Arabic language to meet mothers' practical needs or knowledge deficits regarding fever and its management. The content validity of the study tools was assessed and revised by a panel of 5 experts within the field of pediatric nursing for its clarity, content and sequence of items. According to their suggestions, the required modification was done in the form; add the name of the child and frequency of exposure to fever attacks for child data, add others (digital thermometer) as an option for question you always measure your child's temperature by using and add others (all of the above) for questions related to cause (s), sign(s) and symptom(s) and complication(s) of fever.

The internal consistency of the developed tool was tested by using Cronbach's alpha coefficient test by a statistician to assess reliability of the tools; for whole questionnaire (knowledge and practice), the tool was reliable as r =0.91

Pilot study:

A pilot study was carried out with 10% from the total sample size (10 mothers) to test the feasibility and applicability of the tools, who were excluded from the sample. According to the obtained results, the minor modification was made in the form of; add per month to frequency of exposure to fever attacks.

Field work

Data collection period:

- Data collection extended over a period of three months from the first of November 2015 to the first of February 2016.
- The researchers started by introducing themselves to the mothers and giving them a brief idea about the aim and nature of the study.
- The framework of the study was carried out according to 4 phases as the following :

Assessment phase

- Each mother was interviewed before applying the educational guideline in order to collect socio demographic characteristics of the studied subjects
- Assessment of mothers' knowledge about fever and its management was performed using a structured questionnaire sheet(pre/post)
- Assessment of mothers' practices about fever and its management was performed using performance assessment checklists(pre/post)

Planning phase

- Based on the findings of the assessment phase goals, priorities, and expected outcomes were formulated to meet mothers 'practical needs and knowledge deficits regarding fever and its management.
- In this phase, four sessions were planned by the researchers for the mothers to provide them with practical knowledge in caring for their feverish children.

Implementation phase

- Each session (didactic & practical) took between 30- 45 minutes to discuss its items, taking into consideration attention span of mothers.
- The researchers observes mothers' practices pre and post implementation of the educational guideline in the morning and afternoon shifts using tool (II).
- Each session started at 10 am for morning and at 3 pm for afternoon shifts.
- The studied mothers were divided into ten groups; each one was consisted of ten mothers. During the interview the researchers used questions, discussion and other different teaching methods as group discussion, brainstorming, demonstration and re-demonstration. Numerous teaching media were used, such as power point and handout guideline.
- The guiding colored booklet about fever and its management was given to each mother after the assessment phase (during the first session) for attracting her attention, motivated her and help her for reviewing its content when needed.
- During each session the researchers used brief, clear and simple words and at the end of each session a brief summary was given by the researcher.

Evaluation phase

- Each mother was interviewed separately after applying the educational guideline for doing post-test in order to evaluate her knowledge and

practice by using a structured questionnaire sheet part (2) & performance assessment checklists in two different times:

A-Immediate post-test (post 1)

B-Follow up test (post 2): after 3 months from the immediate post test

Comparisons between mothers' pre-test, immediate post and follow up test finding were done to determine the effect of the educational session on mothers' knowledge and practice during caring with their feverish children.

Administrative design:

Actual official permissions; including an ethical committee of the Faculty of the Nursing Mansoura University to get an approval for conducting the study.

Ethical considerations:

The researchers followed ethical research principles as the following: informed consent from each mother for her participation after explaining the aim of the study, anonymity and confidentiality were assured, the study cause no physiological or psychological harm , the right to withdraw at any stage freely without any responsibilities.

Statistical design:

1- Scoring system

The total score for mothers' knowledge regarding their feverish children by using a structured questionnaire sheet, part II were 15 grades, which were divided as the following:

Mothers' knowledge about; body temperature measurement during the attack of fever (2 grades), the best place to put a thermometer to measure temperature(1 grade),normal range of body temperature (1 grade) , definition of fever (1 grade) , first action toward an attack of fever (1 grade) , normal range of body temperature to give the child antipyretic (1 grade) ,normal range of body temperature to seek medical advice (1 grade) , the frequency of measuring body temperature (1 grade) , cause(s) of fever (1 grade) , risk factor(s) of fever (1 grade) , common sign (s) and symptom(s) of fever (1 grade) ,complication(s) of fever (1 grade) , administered of medications (1grade) , traditional measures applied to antipyretic (1grad)

Scoring System of Mothers' Knowledge regarding mothers' fever and its management:

Scores were estimated to evaluate mothers' knowledge about fever and its management; in which each correct answer was given a score one, while zero was given for false, missed or unknown answer .The total scores of study mothers' knowledge are 15 grades (100%), which categorized according to the median which was 8 as:

- Insufficient if less than 8 grades
- Sufficient if equal or more than 8 grades

The total score for mothers' practice regarding their feverish children were 48 grades, by using performance assessment checklists for assessing the following:

Measurement of body temperature under axilla (11 grades), measurement of body temperature rectally (11 grades), applying tepid water compresses (12 grades), administration of oral medication (dropper method) (8 grades), suppository administration (6 grades).

Scoring System of Mother's practice regarding fever and its management:

Scores were estimated to evaluate mothers' practice about fever and its management; in which each correct answer was given a score one, while zero was given for false, missed or unknown answer .The total scores of study mothers' practice are 48 grades (100%), which categorized according to the median which was 16 as:

- Unsatisfactory if less than 16 grades
- Satisfactory if equal or more than 16 and divided into; good :16-19 grades and competent: 20-48 grades

2- Statistical analysis:

The gathered information was organized and categorized, tabulated and analyzed by using SPSS Data were analyzed with **SPSS** version 22. The normality of data was first tested with one-sample Kolmogorov-Smirnov test.

Qualitative data were described using numbers and percent. The relation between categorical variables was tested using the Chi - square test. When more than 25% of the cells have expected count less than 5, Fisher exact test was used.

Continuous variables were presented as **mean** ± **SD** (standard deviation) for parametric data and Median and range for non-parametric data. The two related groups were compared with the Wilcoxon signed rank test (non parametric data). More than two related groups were compared with Friedman test (non parametric data).

3-Data Analysis

The gathered information had been coded and entered in a records based report using the excel application for windows. Frequency analysis and manual revision were used to detect any error. After complete entry, data were transformed to the statistical package of social sciences (SPSS) version 22 by which the analysis was conducted applying frequency tables with percentages. for all the above mentioned statistical tests done, the threshold of significance is fixed at 5% level (p-value).The results were considered; significant when the probability of error is less, than 5% ($p < 0.05$), highly significant when the probability of error is less, than 0.1% ($p \leq 0.001$), the smaller the p-value obtained, the more significant are the results and non-significant when the probability of error is more than 5% ($p > 0.05$).

RESULTS:

Distribution of the feverish children according to their characteristics are proved in **table (1)**, this table revealed that, more than half of children (57%) were male. In relation to birth order, 38% were ranked as the first child.

Figure (1): mentioned the percentage distribution of studied mothers according to their educational level; majority of mothers were educated as 46% had technical diploma and 33% of them had baccalaureate degree while 10% of them had others degrees.

The percentage distribution of studied mothers according to their ages in years is illustrated in **figure (2)**; this figure illustrated that 61% of the mothers were in the age group (20-) years and 34% of them were in the age group (30-) years while 5% of them were in the age group (40-) years.

Table(2): clarified distribution of the mothers' total knowledge and practices regarding fever and its management before, immediately post and follow up implementation of care guideline; there was a statistical significant difference in relation to sufficient mothers' knowledge and satisfactory practices about fever and its management before, immediately post and follow up implementation of care guideline 40%, 100% & 100%, respectively, with a statistical significant difference at $p \leq 0.001$ and 47%, 100% & 99%, respectively, with a statistical significant difference at $p \leq 0.001$

Table (3): cleared a relation between characteristics of the studied mothers and their total knowledge about fever and its management before implementation of care guideline; there was a negative relation between characteristics of the studied mothers and their total knowledge about fever and its

management before implementation of care guideline at $p < 0.05$.

Table (4): presented a relation between characteristics of the studied mothers and their total knowledge about fever and its management immediately after implementation of care guideline, there was no relation between characteristics of the studied mothers and their total knowledge about fever and its management immediately after implementation of care guideline.

Table (5): clarified a relation between characteristics of the studied mothers and their total knowledge about fever and its management follow up implementation of care guideline; there was no relation between characteristics of the studied mothers and their total knowledge about fever and its management follow up implementation of care guideline.

Table (1): Distribution of the feverish children according to their characteristics

Characteristics	N=100
	No.
Gender	
- Boy	57
- Girl	43
Child age/ months Median (Min-Max)	18 (2-36)
Child birth order	
- First	38
- Second	34
- Third	19
- Fourth	8
- Others	1
Frequency of exposure to fever attack / month Median (Min-Max)	4 (1-10)

Figure (1): Percentage distribution of the studied mothers according their educational levels

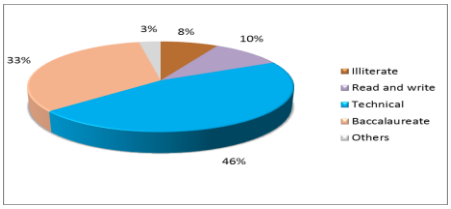

Figure (2): Percentage distribution of the studied mothers according to their ages in years

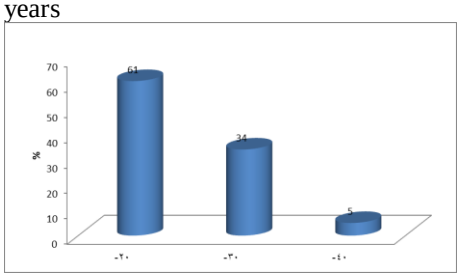

Table (2): Distribution of the mothers' total knowledge and practices regarding fever and its management before, immediately post and at follow up implementation of care guideline

Items	Pre	Immediate post (Post 1)	Follow up (Post 2)	Test of Significance
	No.	No.	No.	
Mothers' knowledge -Sufficient	40	100	100	χ^2= 150,* p ≤ 0.001
-Median score of knowledge	8 (11)	17(1)	15.5(8)	Z_1= 8.726, *P_1≤ 0.001 Z2= 8.658, *P_2≤ 0.001 Z_3=8.055, *P_3≤ 0.001
Mothers' practices -Satisfactory	47	100	99	χ2= 124.526,*p ≤ 0.001
- Median score of practices	16 (42)	48 (0)	44 (34)	Z_1= 8.686, *P_1≤ 0.001 Z_2= 8.675, *P_2≤ 0.001 Z_3= 8.450, *P_3≤ 0.001

Z1 =Wilcoxon Signed Ranks Test to compare pre and post
Z2= compare pre and follow
Z3 = compare post and follow *= Fisher's exa

Table (3): Relation between characteristics of the studied mothers and their total knowledge about fever and its management before implementation of care guideline.

Characteristic	Sufficient knowledge N=40		Insufficient knowledge N=60		Test of Significance
	No.	(%)	No.	(%)	
Marital status of mothers					
- Married	39	97.5%	60	100%	χ^2= 1.515*,
- Divorced	1	2.5%	0	0%	P= .400
Mothers' job					
- Working mother	13	32.5%	13	21.7%	χ^2= 1.464*,
- Housewife	27	67.5%	47	78.3%	p=.251
Residence					
- Rural	25	62.5%	33	55%	χ^2= .554*,
- Urban	15	37.5%	27	45%	p= .537
Family monthly income					
- Satisfactory	26	65%	28	46.7%	χ^2= 3.247,
- Unsatisfactory	14	35%	32	53.3%	P=.101
Family monthly income/person /EGP					
- Enough (750 and more)	38	95%	52	86.7%	χ^2= 2.593,
- Not enough (less than 750)	2	5%	8	13.3%	p=.274

Table (4): Relation between characteristics of the studied mothers and their total knowledge about fever and its management immediately after implementation of care guideline.

Characteristic	Sufficient knowledge N=100	Insufficient knowledge N=0	Test of Significance
	No.	No.	
Marital status			
- Married	99		
- Divorced	1	--	--
Mothers' job			
- Working mother	26	--	--
- Housewife	74		
Residence			
- Rural	58		
- Urban	42	--	--
Family monthly income			
- Satisfactory	54	--	--
- Unsatisfactory	46		
Family monthly income/ person / EGP			
- Enough (750and more)	90	--	--
- Not enough (less than 750)	10		

Table (5): Relation between characteristics of the studied mothers and their total knowledge about fever and its management follow up implementation of care guideline.

Characteristic	Sufficient knowledge N=100	Insufficient knowledge N=0	Test of Significance
	No.	No.	
Marital status			
- Married	99	--	--
- Divorced	1		
Mothers' job			
- Working mother	26	--	--
- Housewife	74		
Residence			
- Rural	58	--	--
- Urban	42		
Family monthly income			
- Satisfactory	54	--	--
- Unsatisfactory	46		
Family monthly income/person /EGP)			
- Enough (750and more)	90	---	--
- Not enough (less than 750)	10		

Discussion

The current study clarified that the more than half of the children who suffer from fever were boys **(table 1)**. Contrary to **Enarson et al. (2012) (17)**, who found that more than two thirds of their feverish children were girl in his study about "Beliefs and Expectations of Canadian Parents who bring Febrile Children for Medical Care" in the Edmonton (Alberta, Canada) area. From the researcher point of view, mothers seek immediate medical help for male gender than female children due to gender bias and traditions in society.

The results of the present study revealed that more than three fifths of the mother were in the age group (20 -) year and more than two fifths of them have technical certificates **(figure 1& 2)**. From the researcher point of view, insufficient mothers' knowledge and practices in caring with their feverish children could be attributed to their young age. This finding is in disagreement with **Enarson et al. (2012)**, **(17)** who reported that median age of the studied mothers was 32 years; range 20 to 52 years and half of them have elementary school and **Alex-Hart and Frank-Briggs (2011) (18)**, in his study about "Mothers' Perception of Fever Management in Children" at Pediatrics Outpatient Clinic of University of Port Harcourt Teaching Hospital who found that more than three fifths of the mothers have tertiary education, more than one quarter of them have secondary education and few of them have primary education and no formal education.

In relation to distribution of total mother's knowledge and practices regarding their children with fever before, immediately post and follow up implementation of care guideline, the current results revealed that there was a statistical significant difference in relation to mother's knowledge and practice about fever and its management before, immediately post and follow up implementation of care guideline at p ≤0.001 **(table 2)**. This is in agreement with a study done by **Alqudah, Johnson, Cowin and George (2014) (19)**, about "An Innovative Fever Management Education Program for Parents, Caregivers, and Emergency Nurses ", and found that educational application resulted in increased parent knowledge about fever and its control and capacity to make contributions to a reduction inside the variety of beside the point emergency department/primary care presentations. This improvement could be explained by the positive impact of the educational program on the mothers` knowledge. Also, it could be explained by the interest of the mothers with the teaching methods and the audio-visual materials used in the educational program that encouraged them. From the researcher point of view, the improvement of the mothers` knowledge might be as a result of their active involvement in educational sessions through discussion and the frequent review of knowledge of the researcher and encouraged them to be interested to have an active role in the caring for their feverish children.

Concerning the relation between characteristics of the studied mothers and their total knowledge about fever and its management before, immediately after and at follow up implementation of care guideline, the current study reported that characteristics of the studied mothers, not influenced on total knowledge (p>0.05) **(table 3 , 4 & 5)**. Contrary to **Chang et al (2013) (20)**, who found that socioeconomic characteristics influenced by fever knowledge, but had a minimal impact on overall knowledge scores(p < 0.05) in their study about "Parental Knowledge, Concerns, and Management of Childhood Fever in Taiwan "in

Pediatric Clinics and Kindergartens in Southern Taiwan.

Conclusion

The results of the present study it can be concluded that:

There was an improvement in mothers' knowledge and practice in caring for their feverish children after implementation of care guideline either immediately post or at follow up than before its implementation.

Recommendations

In the light of the findings of the current study, the following recommendations are suggested:

A. For the mothers:

1. Continuous and regular care guideline is essential for improving the mothers' knowledge and practices in caring for their children with fever.
2. Availability of guideline (a handbook) of fever and its management as a source (reference) to all mothers in the hospitals.

B .Further studies are needed to:

1. Application of fever and its management educational sessions for large probability sample for different geographical areas.
2. Assess of mothers' barriers that hinder their compliance with applying guideline of fever and its management

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