Assessment of Nurses' Knowledge and Attitudes toward Fever Management for Children at Assiut Children University Hospital

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Abstract

Fever is one of the most common presenting signs of illness in office based primary care pediatric practice, accounting for 19% to 30% of visits. Fever is also the second most common reason for hospital admission of children. **The aim of this study:** is to assess nurses' knowledge and attitude toward fever management. Descriptive research design was utilized to meet the aim of this study. **Subjects and method:** This study was conducted in three units (Gastroenterology Unit, Intermediate and Intensive Care Units) at Assuit Children University Hospital. The subjects of this study consisted of 73 nurses who were working in the previous units. Two tools were used to collect the required data for this study, tool one: Structured questionnaire sheet for assessment of nurses' knowledge regarding fever and fever management, tool two: Fever management attitude scale **(FMA)** for assessment of nurses' attitude related to fever and fever management (Walsh et al., 2005). **Results:** The main results of study demonstrated that 78.1% of studied nurses had unsatisfactory knowledge about fever and fever management. Statistically significant difference was illustrated between nurses place of work and their total percent score of knowledge **(p-value =0.021**). It was shown that nurses who worked at intensive care unit have satisfactory score of knowledge compared with the nurses who worked at intermediate care unit (**34.5% and 23.1% respectively**). It was noticed that antipyretic use without doctor order was reported by 43.8% of nurses. Forty six and half percent of nurses (46.5%) had negative attitude toward antipyretics were minimally effective in preventing recurrences. Most nurses (83.6%) disagreed that febrile convulsions do not cause neurological damage. **Conclusion**: More than three quarters of nurses included in this study had unsatisfactory knowledge about fever and fever management. All nurses have positive attitude toward fever and its management. **Recommendations:** Carrying out health education programs for all nurses to improve a general knowledge and attitude toward fever and its management.

Key words: Fever, Nurses' Knowledge, Attitudes, Children, Fever management

Introduction

Fever is a common complaint in pediatric patients and a common problem in both the intensive care unit and the pediatric ward. Elevated temperature in children has been linked to increased hospital lengths of stay, increased morbidity and greater disability **(Serrano, 2012).**

Fever isn't an illness in itself; it's usually caused by a virus or bacterial infection. It is thought to be part of human body's natural response to an infection. However, a fever can occasionally be a sign of a more serious illness, such as a severe bacterial infection of the blood (septicaemia), urinary tract infection, pneumonia or meningitis **(Bupa's Health Information Team, 2011).**

Fever, a common event in childhood, is generally an indication of a self-limiting viral infection rather than a bacterial infection or serious illness **(Knobel et al. 2002).** In children, temperatures of 40°C or less are more likely to indicate the body's adaptive response to the infective process rather than the severity of illness. Many health professionals perceive fever to be harmful and determine illness severity by the degree of temperature elevation **(Sarrell et al. 2002).**

Fever is a normal response that may even help to fight infections; it does not harm the child. Bringing temperature down does not seem to prevent fits, children with a high temperature (40 ºC or more) are more likely to have a more serious infection **(The Department of General Practice, 2006).** Fever in a young infant is considered more urgent than fever in an older child. Any child with fever who has decreased ability to fight infection should be considered potentially unstable. Transport the child for further medical evaluation, even if all assessment findings are normal **(Robbins, 2011).** Children who have experienced several febrile episodes during the first year of life have lower incidence of allergies than those with only one or no febrile illness **(EL-Radhi , 2011).**

Infants and young children are particularly susceptible to fever because of their small body size, high ratio of body surface area to weight, and low amount of subcutaneous fat. Although most experts consider fever a beneficial physiologic response to the infectious process, it can lead to child irritability

and stress as well as high parental anxiety. Therefore, physicians usually prefer to prescribe antipyretic agents in addition to non-pharmacologic physical fever-reducing modalities **(Sarrell et al., 2006).**

Nurses had limited knowledge about the physiology of fever, general fever management and antipyretic use in fever management . Although antipyretics have not been found to prevent febrile convulsions, health professionals continue to administer antipyretics to febrile children to prevent febrile convulsions and harm from fever. **(Sarrell et al. 2002).**

A person's attitude towards an object is a function of his beliefs about the object and the evaluative aspects of those beliefs. The more a person believes an object has "good" characteristics, Qualities, and attributes, the more that person will "like" (or have a positive attitude towards) the object, as regards total scores of nurses'attitude toward (fever ,antipyretics, their use in fever management and febrile convulsion). It was noticed that all nurses (100 %) had positive attitude scores toward fever, antipyretics and their use in fever management and febrile convulsion **(Walsh et al., 2005).**

Nursing care of children with fever is applied within the nursing process which consists of a series of five components or phases. They include assessment, diagnosis, planning, implementation and evaluation **(John Dempsey Hospital-Department of Nursing, 2008).**

Temperature recording is an important nursing action in fever management. Medical officers use these recordings to determine the nature of illness and observe children's cardiovascular response to fever **(Edwards et al., 2001).** Options for treating fever include physical measures (taking cool fluids and dressing lightly) and the antipyretic drugs paracetamol (acetaminophen) and ibuprofen. Evidence for physical measures is now redundant as it mostly pertains to tepid sponging, which is no longer recommended **(Hay et al., 2008)**. Unwrapping an overdressed child is appropriate **(NSWHealth, 2010).**

Magnitude of problem:

The incidence of fever during typical ICU stay has been reported to vary between 5-70%.; more than 30% of ward children and as much as 90% of critically ill children experienced fever. It is estimated that nosocomial fevers occur in approximately one-third of all medical patients at some time during their hospital stay in patients admitted to the ICU with severe sepsis**.** Elevated temperature in patients has been linked to increased hospital and intensive care unit lengths of stay, increased morbidity and greater disability. In Egypt there was no available specific census for more updated incidence of fevers in ICUs. **(Ferguson, 2007)**.

Aim of the study

This study aims to assess nurses' knowledge and attitudes toward fever management of children at Assiut Children University Hospital.

Research Question:

Is there a relationship between personal data of nurses and their knowledge and attitude?

Is there a positive relationship between nurses ' knowledge and their attitude?

Subjects and Method

Research design: Descriptive research design was used to conduct this study.

Setting:-The study was conducted in three units Gastroenterology Unit, Intermediate Care Unit and Intensive Care Unit at Assuit Children University Hospital.

Subjects:-

The study included 73 nurses who were working in the mentioned settings.

Tools of the Study

Two tools for collecting data were used in this study.

Tool (I): Structured questionnaire sheet for assessment of nurses' knowledge

It was developed by the researcher after reviewing the related literature to assess the nurses' knowledge toward fever and fever management. It included of two parts:

Part one: Personal characteristics of nurses such as nurses' name, age, marital status, place of residence, qualification, years of experience and duration in the current work place.

Part two: Nurses' knowledge regarding fever and fever management of children. Questionnaire sheet were consisted of 17 items. A score of one was given for correct answer and a zero for incorrect answer.

Tool (II): Nurses attitude related to fever and fever management of children.

- Fever management attitude scale **(FMA)** adopted by **Walsh et al., (2005)**. It consists of 26 items and used by the researcher to assess nurses' attitudes toward fever and fever management of children. It consisted of the following; nurses 'attitudes toward fever (9 items), nurses 'attitudes toward antipyretics and their use in fever management (9 items) and nurses 'attitudes toward febrile convulsions (8 items).

Method of data collection:

1. Reviewing of the related literature to assess the nurses' knowledge toward fever and fever management.
2. An official Permission was obtained from the director of Assiut Children University Hospital and the heads of Gastroenterology unit, Intermediate

and Intensive care units in the previously mentioned hospital.

3. A pilot study was conducted on 10% of nurses from Assiut Children University Hospital to test the clarity and feasibility of the tool. According the modification were done.
4. Confidentiality of the data was asserted. Explanation of the aim and methodology of the study was explained to nurses by the researcher. The right to refuse to participate in the study was emphasized to the nurses.
5. The validity was done for **tool (I)** by five experts in the Pediatric field and its result was 96%.
6. Reliability was estimated by Alpha Cronbach's test for the tool and its result was R=0.66.
7. The researcher collected the needed data for nurses' characteristics, their knowledge and attitudes by applying **tool (I & II)**. Data were collected during routine work of the units.
8. Each nurse was interviewed individually for her knowledge and attitudes towards fever and fever management of hospitalized children. Time taken to fill the sheet from 30 to 45 minutes.
9. Data were collected during the period from the beginning of November 2011 to January 2012.

Scoring system

A) *Scoring system of the questionnaire sheet :*

- The grading of nurses according to their knowledge total score was done as follows:
- Satisfactory = 60% and more
- Unsatisfactory less than 60%

B) *Fever management attitude scale* **(FMA)**: The responses were measured on a five –point likert scale ranging from strongly agrees to strongly disagree. Items were respectively scored 5, 4,3,2 and 1 for the responses (strongly agree, agree, uncertain, disagree and strongly disagree). The scoring was reversed for negative items.

The median score was 50, nurses scored 50 and above were considered to have positive attitude while nurses scored less than 50 were considered to have negative attitude.

10. Statistical analysis of data

Data entry was done using compatible personal computer. The statistical analysis was done using SPSS-16 statistical software package and Excel for figures. The content of each tool was analyzed, categorized and then coded. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables. Qualitative studied variables were compared using Chi-square test. Statistical significance was used at P.value <0.05.

Results

Table (1): Personal characteristics of the studied nurses :(n=73)

Items	No. (n= 73)	%
Age: (years)		
< 20	5	6.8
20 - < 30	52	71.2
≥ 30	16	21.9
Mean± SD	28.4 ± 5.9	
Marital status		
Single	19	26
Married	54	74
Place of residence:		
Rural	39	53.4
Urban	34	46.6
Qualification		
Secondary nursing diploma	51	69.9
Technical Institute of nursing	11	15.1
Bachelor of nursing	11	15.1
Years of experience		
< 5	19	26
5 - < 10	36	49.3
≥ 10	18	24.7
Duration in the current work place		
< 6 months	32	43.8
6 months - < 1 year	28	38.4
≥ 1 year	13	17.8

Table (2): Percentage distribution of Nurses' knowledge about fever :(n=73)

Items	No. (n= 73)	%
Definition of fever:		
• Correct answer (Fever in infants and children is defined as an increase in body temperature above the normal limit ≥38ºc measured rectally and 37.5 ºc or more measured orally, Responding to the stimulus of the disease	66	90.4
• Incorrect answer	7	9.6
Mechanism used to maintain body temperature		
• Body temperature is controlled by hypothalamus	35	47.9
• Body temperature is controlled by hypothalamus and heat dissipation by the sweating	12	16.4
• Don't know	24	32.9
Mechanism of fever		
• Leukocytosis in response to repeated infectious agents	2	2.7
• toxic reactions	30	41.1
• Don't know	41	56.2
Causes of fever		
• Inflammation caused by bacteria or virus	53	72.6
• Upper Respiratory Tract Infection	40	54.8
• Lower Respiratory Tract Infection	50	68.5
• Other	24	32.9
Benefits of fever		
• Fever occurs as a natural response of body to infection and have immunological benefits	4	5.5
• Don't know	69	94.5
Signs and symptoms of fever in children		
• Forehead warmth	18	24.6
• Flashed face	54	74
• Shivering	28	38.4
• Hallucination and Drowsing	7	9.6
• Sweating	3	4.1
• Redness of the skin	38	52.1
• Exhaustion and humor	24	32.9
• Rash on the skin	7	9.6
• Tachycardia	7	9.6
• Tachypnea	8	11
• Don't know	20	27.4

Table (3): Percentage distribution of Nurses' knowledge about Nursing role of feverish children: (n=73)

Items	No. (n= 73)	%
Feverish child care goals		
• Reduce body temperature	44	60.3
• Prevent convulsions	30	41.1
• Prevent dehydration	11	15.1
• Don't know	1	1.4
Nursing care of feverish child		
• Cold compresses by tap water	66	90.4
• Sponge bath with lukewarm	32	43.8
• Dressing the child a light cotton	11	15.1
• Encourage increase intake of fluids and water	5	6.8
• Antipyretic use as prescribed by the doctor	36	49.3
• Observe if there is any convulsion or dehydration	5	6.8
• Regular measuring the vital signs especially temperature by thermometer	35	47.9
• Record intake and output e.g. urine, vomiting and presence of sweating on child, amount of drinking fluids	1	1.4
Health education to parents about fever management		
• Ease blankets as long as the temperature exceeds 38°c	18	24.7
• Give the child cold and sweet drinks especially during the night to avoid dehydration	7	9.6
• Provide a light feeding of the child, such as yogurt, boiled potatoes and soup	4	5.5
• Antipyretic use as prescribed by the doctor	9	12.3
• Bathing • If mother cannot bathe the child, he should be wrapped in a towel moistened with lukewarm	18	24.7
	3	4.1
• Regular measuring of vital signs especially temperature by thermometer	24	32.9
• Cold compresses from the tap	59	80.8
• Seek doctor's advice	18	24.7
• Observe if there is any convulsion and report	5	6.8

Fig.1. Percentage of total score of studied nurses 'knowledge about fever and fever management in children (n=73).

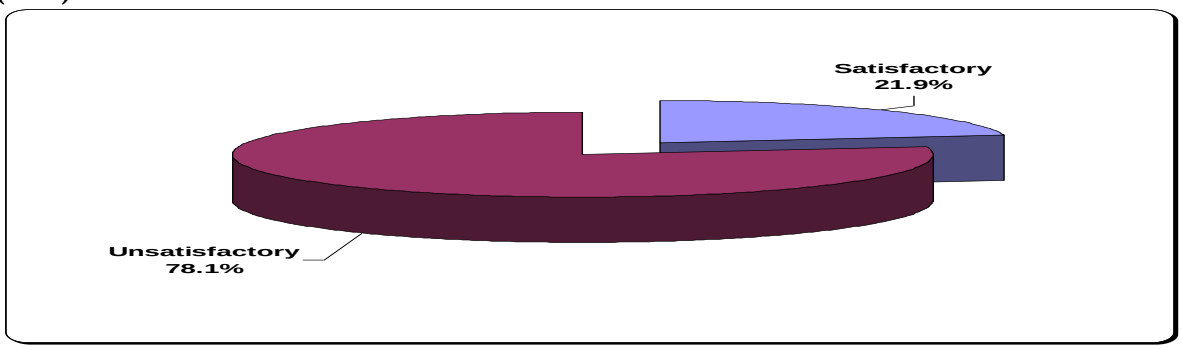

Table (4): Nurses attitudes toward fever: (n=73)

Items	Strongly Disagree		Disagree		Uncertain		Agree		Strongly Agree	
	No.	%	No.	%	No.	%	No.	%	No.	%
The benefits of fever	33	45.2	18	24.7	17	23.3	3	4.1	2	2.7
External cooling methods causing shivering	6	8.2	9	12.3	5	6.8	35	47.9	18	24.7
Reduced tolerance to fever in children with cardiac and respiratory disorders	9	12.3	14	19.2	3	4.1	29	39.7	18	24.7
Most nurses' believed fever the commonest reason for parents taking a child to the doctor	0	0.0	1	1.4	1	1.4	15	20.5	56	76.7
Parents become phobic about fever	0	0.0	3	4.1	0	0.0	16	21.9	54	74.0
Childhood temperatures are often unrelated to illness severity	27	37.0	20	27.4	3	4.1	16	21.9	7	9.6
Fever below 41°C might be harmful	1	1.4	8	11.0	0	0.0	21	28.8	43	58.9
Immune responses were maintained in fevers greater than 41°C	26	35.6	16	21.9	11	15.1	14	19.2	6	8.2
Fever makes nurses to be phobic	3	4.1	15	20.5	0	0.0	12	16.4	43	58.9

Table (5): Nurses attitudes toward antipyretics and their use in fever management of children (n=73)

Items	Strongly Disagree		Disagree		Uncertain		Agree		Strongly Agree	
	No.	%	No.	%	No.	%	No.	%	No.	%
Regular antipyretic administration could mask fever that is indicative of an infective process	20	27.4	17	23.3	9	12.3	19	26.0	8	11.0
Paracetamol reduced fever for 3 to 4 hours	5	6.8	6	8.2	4	5.5	30	41.1	28	38.4
Paracetamol necessary for all children with temperatures of 38.3°C and higher	6	8.2	10	13.7	1	1.4	20	27.4	36	49.3
It was necessary to wake sleeping children with a temperatures of 38.3°C or higher for administration of antipyretic	4	5.5	12	16.4	0	0.0	17	23.3	40	54.8
Temperature alone formed the basis for antipyretic administration	5	6.8	23	31.5	3	4.1	18	24.7	24	32.9
Doctors recommend antipyretics to reduce temperature	3	4.1	9	12.3	1	1.4	21	28.8	39	53.4
Antipyretics caused temperatures to 'overshoot' into a subnormal range	38	52.1	22	30.1	3	4.1	7	9.6	3	4.1
Antipyretics reduced temperature by approximately 2°C	11	15.1	16	21.9	8	11.0	25	34.2	13	17.8
It is better to reduce temperatures non-pharmacologically	17	23.3	24	32.9	0	0.0	12	16.4	20	27.4

Table (6): Nurses attitudes toward febrile convulsions: (n=73)

Items	Strongly Disagree		Disagree		Uncertain		Agree		Strongly Agree	
	No.	%	No.	%	No.	%	No.	%	No.	%
Initial febrile convulsions are not preventable	36	49.3	15	20.5	5	6.8	11	15.1	6	8.2
Febrile convulsions do not cause neurological damage	48	65.8	13	17.8	9	12.3	1	1.4	2	2.7
Febrile convulsions generally occur within the first 24 hours of a febrile illness	3	4.1	6	8.2	12	16.4	28	38.4	24	32.9
A history of febrile convulsion is a risk factor for a recurrence of fever	1	1.4	6	8.2	2	2.7	30	41.1	34	46.6
It is necessary to prevent febrile convulsions in all children by effectively treating fever with antipyretics	11	15.1	17	23.3	4	5.5	23	31.5	18	24.7
A recurrent febrile convulsion could occur 6 to 12 months following an initial febrile convulsion	5	6.8	12	16.4	20	27.4	24	32.9	12	16.4
A family history of febrile convulsions was a risk factor for a febrile convulsion	15	20.5	25	34.2	4	5.5	18	24.7	11	15.1
Antipyretics were minimally effective in preventing recurrences	14	19.2	19	26.0	6	8.2	22	30.1	12	16.4

Table (7): Relationship between personal characteristics of the studied nurses and their total score of knowledge about fever and fever management. (n=73)

	Knowledge				X2	P-value
	Unsatisfactory		Satisfactory			
	No.	%	No.	%		
Place of work						
• Gastroenterology unit	18	100.0	0	0.0	7.748	0.021*
• Intermediate care unit	20	76.9	6	23.1		
• Intensive care unit	19	65.5	10	34.5		
Marital status						
• Single	13	68.4	6	31.6	1.401	0.237
• Married	44	81.5	10	18.5		
Age: (years)						
• < 20	2	40.0	3	60.0	4.550	0.103
• 20 - < 30	42	80.8	10	19.2		
• ≥ 30	13	81.2	3	18.8		
Place of residence						
• Rural	29	74.4	10	25.6	0.678	0.410
• Urban	28	82.4	6	17.6		
Qualification						
• Secondary nursing diploma	39	76.5	12	23.5	4.506	0.105
• Technical Institute of nursing	7	63.6	4	36.4		
• Bachelor of nursing	11	100.0	0	0.0		
Years of experience						
• < 5	12	63.2	7	36.8	3.830	0.147
• 5 - < 10	31	86.1	5	13.9		
• ≥ 10	14	77.8	4	22.2		

	Knowledge				X2	P-value
	Unsatisfactory		Satisfactory			
	No.	%	No.	%		
Duration in the current work place						
• < 6 months	22	68.8	10	31.2	2.906	0.234
• 6 months - < 1 year	24	85.7	4	14.3		
• ≥ 1 year	11	84.6	2	15.4		

* Significant

Table (1): Regarding marital status, 74% of nurses were married. More than two thirds (71.2%) of nurse's aged from 20 to less than 30 years while 21.9% of them aged 30 years and more with a mean 28.4 ± 5.9 years. Also more than half of nurses 53.4% came from the rural areas. As regards their qualification, more than two thirds of nurses (69.9 %) had secondary diploma in nursing while, an equal percentage of nurses 15.1% had Technical Institute of Nursing and Bachelor of Nursing. As regarding nurses' years of experience, it was noticed that nearly half of nurses (49.3%) had work experience ranged from 5 to less than 10 years. Also the duration in the current work place of the studied nurses were less than 6 months, 6 months to less than one year , one year and more as reported by 43.8%, 38.4% and 17.8% of them respectively.

Table (2): Illustrates the percentage distribution of nurses' knowledge about fever in children. It was found that the majority of nurses (90.4%) defined fever correctly. The mechanism used to maintain body temperature as hypothalamus was reported by 47.9% of studied nurses. Body temperature is controlled by Heat dissipation by the sweating as a method of control of body temperature was illustrated by 16.4% of nurses while, 32.9% of nurses did not know it.

It was noticed that more than half of nurses did not know the mechanism of fever 56.2%. The mechanism of fever occurs in response to infectious agents or toxic reactions were illustrated by 41.1% of nurses. Leukocytes as a mechanism of fever were reported by only 2.7% of nurses. The causes of fever as inflammation caused by bacteria or virus were reported by 72.6% of the studied nurses. Upper and Lower respiratory tract infection as causes of fever were illustrated by 54.8% and 68.5% of nurses respectively. While, 32.9% of nurses did not know it. It was noticed that benefits of fever as a natural response of body to infection and have immunological benefits were reported by only 5.5% of the studied nurses while, high percentage of nurses 94.5% did not know it.

It was found that the signs and symptoms of fever in children were stated as warm forehead by 24.6% of nurses. Flashed face was reported by high percentage of nurses (74.0%). Shivering was stated by 38.4% of nurses. Hallucination, drowsing, rash on the skin and tachycardia were reported by an equal percentage of nurses 9.6%. In addition, redness of the skin was mentioned by more than half of nurses 52.1%. While exhaustion and humor was reported by about one third (32.9%) of nurses. Tachypnea was illustrated by 11.0% of nurses. Only 1.4% of nurses mentioned sweating as a sign of fever.

Table (3): Illustrates the percentages distribution of nurses' knowledge about nursing role of feverish children. It was illustrated that feverish child care goals as reduce body temperature was reported by more than half of nurses (60.3%). It was noticed that prevention of convulsions was reported by more than one third of nurses (41.1%). Prevention of dehydration was mentioned by 15.1% of nurses while only 1.4% of nurses did not know. It was found that using cold compresses by tap water was reported by the majority of nurses (90.4%), sponge bath was mentioned by 43.8% of nurses, also encouraging intake of fluids and water and observe if there is any convulsion or dehydration were reported by an equal percentage of nurses (6.8%). Dressing the child a light cotton clothes was stated by 15.1% of nurses.

It was noticed that antipyretic use as prescribed by the doctor order was reported by 49.3% of nurses. Regular measuring the vital signs especially temperature by thermometer was reported by 47.9% of nurses while recording intake and output was mentioned by only 1.4% of nurses.

It was found that the parent's health education about fever management as cold compresses from the tap was reported by more than three fourths of nurses (80.8%). Also ease blankets as long as the temperature exceeds 38°c, bathing and seek doctor's advice were reported by an equal percentage of nurses (24. 7%). Antipyretic use as prescribed by the doctor was reported by only 12.3% of nurses. In addition, giving the child cold and sweet drinks especially during the night to avoid dehydration and Providing a light feeding of the child, such as yogurt, boiled potatoes and soup were mentioned only by (9.6% and 5.5%) of nurses, respectively. Regular

measuring of vital signs especially temperature by thermometer was mentioned by about one third (32.9%) of nurses while observing if there is any convulsion and wrapping the child in a towel moistened with lukewarm water, if the mother cannot bathe the child were illustrated by (6.8% and 4.1%) of nurses, respectively

Fig.1. Shows the total score of nurses' knowledge about fever and its management. It was found that more than three quarters of them (78.1%) had unsatisfactory knowledge about fever and fever management of children.

Table (4): Illustrates nurses' attitudes toward fever. Positive attitudes toward external cooling methods causing shivering were found in (72.6%) and reduced tolerance to fever in children with cardiac and respiratory disorders (64.4%). Most nurses believe that fever is the commonest reason for parents taking a child to the doctor (97.2%) and that Parents become phobic about fever (95.9%). positive attitudes about maintaining immune responses in fever greater than 41°C were found in (57.5%). Negative attitudes were found toward the benefits of fever (69.9%). Negative attitudes were reflected in the belief that childhood temperature is often unrelated to illness severity (64.4%). Fever below 41°C might be harmful (87.7%). More than half of nurses (75.3%) have phobic action regarding fever.

Table (5): Illustrates nurses' attitudes toward antipyretics and their use in fever management. Positive attitudes were found toward the effect of Paracetamol in reducing fever for 3 to 4 hours (79.5%) and that Paracetamol is necessary for all children with temperatures of 38.3°C and higher (76.7%). Most nurses agreed that it was necessary to wake sleeping children with a temperatures of 38.3°C or higher for an antipyretic administration (78.1%). Doctors recommendations about using antipyretics to reduce temperature and antipyretics caused temperature to 'overshoot' into a subnormal range was reported by an equal percentage of nurses (82.2 % and 82.2%). Also more than half of nurses (52%) agreed that antipyretics reduce temperature by approximately 2°C. Negative attitudes were found regarding regular antipyretic administration could mask fever as an indicative of an infective process (50.7%) and temperature alone formed the basis for antipyretic administration (57.6%). Only 43.8% believed that it is better to reduce temperatures non-pharmacologically.

Table (6): Illustrates nurses' attitudes toward febrile convulsions. Only 23.3% of nurses agreed that initial febrile convulsions are not preventable, more than two thirds of nurses (71.3%) believed that febrile convulsions generally occur within the first 24 hours of a febrile illness and a history of febrile convulsion was a risk factor for a recurrence (87.7%). Positive attitudes were found toward the possibility of recurrence of febrile convulsion 6 to 12 months following an initial febrile convulsion (49.3%). More than half of nurses (56.2%) believed that it is necessary to prevent febrile convulsions in all children by effectively treating fever with antipyretics. Only 39.8% of nurses believed that a family history of febrile convulsions was a risk factor for its occurrence. Most nurses (83.6%) disagreed that febrile convulsions do not cause neurological damage. Near half of nurses (46.5%) believed that antipyretics were minimally effective in preventing recurrences.

Table (7): Illustrates the relationship between nurses' Personal characteristics and their total percent scores of knowledge about fever and fever management. Statistically significant differences were found between nurses' place of work and their total percentage score of knowledge (p-value =0.021). It was shown that nurses who worked at intensive care unit have higher percentage of total score of knowledge (34.5%) compared with the nurses who worked at intermediate care unit (23.1%) while no statistically significant differences were shown regarding the other items, marital status, age , place of residence, qualification, years of experience and duration in the current work place.

Discussion

The current study results revealed that more than three quarters of nurses (78.1%) with different educational levels, irrespective of their years of experience or area of work had unexpectedly unsatisfactory knowledge scores about fever and fever management as shown in Table (7). The unsatisfactory nurses' knowledge was related to the absence of training programs in fever management, and no formal hospital policies for fever management, these findings were confirmed by **Mohamed and Ali, (2012) & Considine and Breman, (2007).**

The present study revealed that nurses who were working in Intensive Care Unit had significantly higher knowledge scores than those who were working in Intermediate Care Unit and Gastroenterology Unit (P.0.021) as shown in Fig. (1). This can be explained by the fact that the superiority of nurses' knowledge that has been showed in the current study could be related to certain factors. Nurses' aged might be a factor as it plays a vital role in improving the nurses' knowledge. The young age nurse, who is more active, initiative, has good physical fitness and creative in achieving the nursing knowledge.

As regarding the total scores of nurses 'attitude toward (fever, antipyretics and their use in fever management and febrile convulsion), it was noticed that all nurses (100%) had positive attitude toward fever and fever management of children. This can be explained by the attitude is internalized not need to be recalled despite knowledge is subjected to be forgotten. This finding agreed with **Walsh et al., (2005)** who found that nurses' responses were positive. However it disagreed with **Shu Hua Lu, (2013)** who stated that attitude towards fever and its management showing a higher percentage of negative than positive attitudes while **Chung and Kim, (2009)** stated that both positive and negative attitudes were discovered.

Although, Strong evidence-based support for the beneficial effects of mild fever has been available for 30 years **(Knobel et al., 2002 and Sarrell et al., 2002)**, nurses continue to reduce low grade fever without other symptoms. The present study depicted that more than two thirds of nurses (69.9%) disagreed that fever have benefits as shown in table (4). This is in accordance with **Chung and Kim, (2009)** who found that Pediatric nurses' in the study reported negative attitudes toward beneficial effects of fever.

The current study represents that nearly two thirds of nurses (64.4%) agreed that fever cannot be tolerated in children with cardiac and respiratory disorders because it increases the metabolic rate and the demands on the cardiopulmonary system as shown in table (4).This finding was in accordance with the results of a study conducted by **Walsh et al., (2005).**

The present study revealed that approximately two thirds of nurses (64.4%) disagreed that childhood temperatures are often unrelated to illness severity as shown in table (4), this finding is in accordance with the results of a study conducted by **(Sarrell et al., 2002)** who identified that pediatric nurses have negative attitudes toward fever .These included beliefs that temperature is related to illness severity.

The findings of the current study delineated that most nurses (87.7%) agreed that fever below 41° C might be harmful as shown in table (4). This finding agrees with **Walsh et al., (2005)** who identified negative beliefs and attitudes of nurses toward fever. These included beliefs that fevers below 41°C might be harmful.

As illustrated in this study, more than half of nurses (57.5%) disbelieved that immune responses were maintained in fevers greater than 41°C as shown in table (4). These results were in contrast with those obtained by **Walsh et al., (2005)** who reported that more than half of nurses (59.6%) have inappropriate attitudes toward maintaining immune responses in fevers greater than 41°C.

The present study revealed that more than two thirds of nurses (75.3%) agreed that fever makes them to be phobic as shown in table (4). This finding was in accordance with the results of the study conducted by **Walsh et al., (2005).**

The present study represents that half of nurses (50.7%) disagreed that regular antipyretic administration could mask fever as indicative of an infective process as shown in table (5). This finding disagree with **Walsh et al., (2005)** who reported that most nurses found regular antipyretic administration could mask fever indicative of an infective process (94.0%).

The findings of the present study demonstrated that about more than three fourths of nurses (79.5%) have positive attitude toward effect of paracetamol in reducing fever for 3 to 4 hours as shown in table (5). This finding was in accordance with the results of a study conducted by **Walsh et al., (2005)** who found that most nurses agreed that paracetamol reduced fever for 3 to 4 hours (88.3%).

As illustrated in this study, more than two thirds of nurses (76.7%) agreed that Paracetamol was necessary for all children with temperatures of 38.3°C and higher, these findings disagree with **Walsh et al., (2005)** who found that 31.4% of nurses believed that paracetamol was necessary for all children with temperatures of 38.3°C and higher.

In the current study, most nurses (78.1%) stated that it was necessary to wake sleeping children with a temperature of 38.3°C or higher for an antipyretic as shown in table (5). This finding was in accordance with the results of a study conducted by **Greensmith and Louise, (2012)** which showed that 74% of nurses awaken sleeping febrile children who have no other symptoms for antipyretic administration but this finding disagree with **Demir and Sekreter, (2012)** who found that 10% of participants in their study recommended that a sleeping febrile child should not be disturbed. According to some pediatricians, sleeping febrile child should not be awakening for any reason, including medication.

It was found in the present study that more than half of nurses (56.2%) disagree with treating fever non – pharmacologically as shown in table (5). This is in accordance with **Chiappini et al., (2009)** who reported that the use of physical methods to reduce fever is not recommended. Bathing or sponging with lukewarm or cool water can effectively reduce body temperature in those with heat illness but not usually in those with fever.

The present study revealed that most nurses (83.6%) disagreed that febrile convulsions do not cause neurological damage as shown in table (6). This finding disagree with **Walsh et al., (2005)** who found

that most nurses (92.1%) correctly believed fever does not cause neurological damage.

In the current study, about two thirds of nurses (69.8%) have negative attitude that initial febrile convulsions are not preventable as shown in table (6). The finding agrees with the results of the study conducted by **Walsh et al., (2005)** who found that most nurses (90.2%) believed that initial febrile convulsions are not preventable.

The present study showed that, more than half of nurses (57.7%) disbelieved that a family history of febrile convulsions was a risk factor for a febrile convulsion as shown in table (6). This finding is consistent with **Walsh et al., (2005)** who found that 53% of nurses also disbelieved a family history of febrile convulsions was a risk factor for a febrile convulsion.

The current study represents that more than one third of nurses (46.5%) have negative attitude that antipyretics were minimally effective in preventing recurrences as shown in table (6). These findings disagree with **Walsh et al., (2005)** who found that more than two thirds of nurses (72%) agreed antipyretics were minimally effective in preventing recurrences of febrile seizure.

The present study revealed that more than half of nurses (56.2%) agreed that it is necessary to prevent febrile convulsions in all children by treating fever effectively with antipyretics as shown in table(6). This finding is in accordance with the results of a study conducted by **Sarrell et al., (2002)** who found that nurses continue to reduce fever to prevent febrile convulsions and brain damage. This findings compound negative attitudes and reinforce nurses' fever phobias.

The present study revealed that about half of nurses (49.3%) agreed a recurrent febrile convulsion could occur 6 to 12 months following an initial febrile convulsion as shown in table (6). This finding disagree with the results of a study conducted by **Walsh et al., (2005)** who identified that more than half of nurses (53.0%) disbelieved a recurrent febrile convulsion could occur 6 to 12 months following an initial febrile convulsion .

Conclusion

More than three quarters of nurses involved in this study had unsatisfactory knowledge about fever and fever management while all nurses have positive attitude toward fever and its management.

Recommendations

1- Provision of an up to date educational programs targeted to educate nurses may be an effective action to change the nurses' management of fever, to strengthen positive attitudes, challenge negative attitudes and improve the quality of information given to parents about fever when their child is discharged home.
2- Continuous supervision and evaluation for nurses is needed to determine any defect related to knowledge.
3- A learning environment must be facilitated that is conductive to education.
4- Sharing care and supervision between faculty members and hospital supervisor.
5- The inclusion of physiology of thermoregulation, the pathophysiology and the management of fever in the curriculum of the undergraduate school of nursing students and all learning programs for health care professionals.

Further studies

1-Research regarding the nursing management of fever and the physiological responses associated with fever should be an ongoing process and all nurses should be involved in this process.
2- Carrying out health education programs for all nurses and parents to provide a general reduction in fever phobia and promote a safer drug use.

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