Critical Care Nurses' Knowledge and Practice of Fever Management at a University Hospital

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Abstract: Fever is a common problem in hospitalized patients in both the wards and the intensive care units. Much of fever treatment is based on tradition and the belief that fever is harmful rather than scientific evidence. The aims of this study were to identify the critical care nurses' knowledge regarding fever management, assess their clinical performance and explore the relation between nurses' knowledge and clinical performance regarding fever management of critically ill patients. A descriptive exploratory design was utilized. A sample of convenience of 70 critical care nurses was recruited from different critical care units at El Manial university hospital. Fever knowledge assessment tool and performance observational checklist were utilized. The study results revealed that; the majority of critical care nurses had unsatisfactory knowledge about physiology of thermoregulation (80%), pathophysiology of fever (100%) and management of fever (70%). Observational checklists revealed that 100% of nurses assess fever initially by measuring temperature only; while no plan of fever management was observed in nurses' documentation. Nurses' implementation of fever management was confined to giving antipyretic medication and cold compresses occasionally for febrile patients. Evaluation of the effect of nursing interventions and antipyretics weren't evident in nurses' documentation. No correlation between the total knowledge score and average observations of clinical performance was found (r= - 0.01, p =0.9) was found. The majority of participants' opinions regarding their current fever management indicated that no specified protocol for fever management and less satisfaction with current management. The study recommends that nurses' knowledge and clinical management of fever must be developed through conducting in-service educational programs and developing a standardized protocol of care for fever management in ICU.

1. Introduction

Fever is a common complaint in hospitalized patients and a common problem in both the intensive care unit (ICU) and the patient ward, (Serrano , 2012) . The incidence of fever during a typical ICU stay has been reported to vary between 5-70%.; more than 30% of ward patients and as much as 90% of critically ill patients 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, **(Ferguson , 2007; Peres, et al., 2004. & Marik, 2000).** Elevated temperature in patients has been linked to increased hospital and intensive care unit lengths of stay, increased morbidity and greater disability **(Patricia & Laura 2012 &Peres, et al., 2004)** .In Egypt there was no available specific census for more updated incidence of fevers in ICUs.

As there is variation in the incidence of reported fevers, the etiology of fever in critically ill patients is similarly diverse. Both infectious and noninfectious etiologies are common **(Ryan & Levy, 2003).** The major causes of abnormally elevated temperatures in the critically ill patient can be broadly classified as the hyperthermia syndromes, infectious and noninfectious fevers. The hyperthermia syndromes include environmental hyper-thermo (heatstroke) and drug-induced hyperthermia. Infectious fevers are caused by bacterial, viral, fungal, and protozoal infections; while noninfectious causes of fever are injury, heat stroke or dehydration **(Hasan, et al., 2012 &, Serrano, 2012).**

Fever should lead to a careful physical evaluation and clinical assessment of the patient rather than automatic orders for costly laboratory and radiologic studies that are commonly associated with a low diagnostic yield, **(O'Grady,et al., 2008 & Marik, 2000).** Fever management requires knowledgeable assessment and treatment by critical care nurses. Although temperature measurement and fever management are not often priorities in the management of a critically ill patient, the physiologic consequences of fever may affect patient morbidity **(Henker & Carlson, 2007)**. Nurses are responsible for diagnosing and treating fever, and using critical thinking allows nurses to provide safe and effective care **(Patricia and Laura 2012).** Therefore, it is imperative for the critical care nurse to understand the physiology of the fever cascade, have knowledge

scope and practice on how to cool a febrile patient and what methods of cooling should be used **(Searle, 2000).**

Saxena, et al., (2012) mentioned that through assessment and data collection the formulation of a nursing diagnosis can be facilitated and increases the probability of successful planning, implementation and evaluation. Nurses must be able to give a reason for nursing actions. It is thus necessary for nurses to keep up with current; acceptable standards of nursing, and be responsible for the administration of prescribed medications. **Samantha et al., (2010)** mentioned that the critical care nurses must bear knowledge of the pharmacological content, dosages, effects, side-effects and contra-indications of medication administered by them to the patient. Finally, evaluating and documenting the patient's response to nursing interventions and then comparing the response to the outcomes criteria written in the planning phase must be accomplished by the nurse. When relevant information is recorded, all members of the health team have a clear understanding of the patient's progress. **(Smeltzer & Bare,2010 and Sophia, 2003).**

Ferguson, (2007) mentioned that previous studies showed that nurses, clinicians and general populations have poor knowledge about fever and its management. Assessment and management of fever were steeped in habits and teaching from the past. Research evidence suggested that if treating fever was not based on accurate evidence then the use of drugs would have little effect on the course of disease.

The management of a patient with fever continues to be controversial. Based on the reviewed literature it is not clear to determine whether fever should be treated, and if treated, at what level temperature and by what method. Hence it may be stated that there is a definite need for the conducting of further research with regard to the fever management in critically ill patients. The gaps in the literature related to fever assessment and management are a challenging frontier for nursing research. **(Holtzclaw, 2002).**

It was detected through empirical observations, and after studying patients' flow sheets, that critical care nurses working in the unit are inconsistent in respect of, and appear to be, uncertain about the management of fever. These management strategies also do not coincide with what the literature suggest. During the audit of nursing documentation, several flow sheets were studied by the researchers; all concerned patients had the potential to develop fever due to the immune/inflammatory response system of the body.

It was found that none of the critical care nurses addressed fever as a potential problem in nursing notes. Moreover, many patients had temperatures ranging from 37.5ºC to 39. 8º C), critical care nurses managed these patients' fever in different ways and at different levels of fever.

Inadequate measuring of body temperature does not provide the evidence for what nurses do, what they should do, or how do they apply knowledge in their departments. Moreover, also, inadequate documentation of nursing practice for feverish patient forms a barrier to evidence-based practice. Accordingly, there will be insufficient evidence for changes in patient's condition or changes in nursing care. As the nurse plays a key role in relieving patient's fever, therefore hopefully this study results will generate attention and motivation for further investigation into this topic as well as the lack of local researches concerned with such a problem necessitate the conduction of this study.

Aim of the study
The aims of this study were to:
1. Identify nurses' current knowledge regarding fever management of critically ill patient.
2. Assess nurses' clinical performance regarding fever management of critically ill patient.
3. Explore the relation between nurses' knowledge and practice regarding fever management of critically ill patient**.**

Research questions
To fulfill the aim of this study, the research questions were formulated:
1- What is the current knowledge of critical care nurses regarding fever management of critical ill patient?
2. What are nurses' clinical performances for adult febrile patients in critical care units?
3. What is the relationship between nurse's knowledge and clinical performance regarding care given to adult febrile patients in critical care units?

2. Subjects and Methods
Research Design:
A descriptive exploratory design was utilized in the current study. **Polit & Beck, (2006)** mentioned that descriptive research provides an accurate account of characteristics of a particular individual, event or group in real-life situations. Exploratory research examines the relevant factors in detail to arrive at description of the reality of the existing situation.
Setting:
This study was conducted in different critical care units (Medical critical care, Coronary

care, Emergency critical care, surgical critical care, and Stroke critical care unit) at El-Manial University Hospital; affiliated with Cairo University in Egypt.

Subjects:

Seventy nurses constituting all nurses working at different concerned critical care units who had a minimum of 1 year work experience and provide direct nursing care to their patients constituted the sample of this study. Criteria for inclusion were age 20 or over, both sexes, and different educational categories. The exclusion criteria were subjects who were piloted and refused voluntarily to participate in the study.

Tools: Two tools for data collections were utilized; they included:

Tool 1: - Interview questionnaire sheet: it was designed and used by the researchers and included two parts:

Part 1: Socio demographic and educational background data: it included data related to subjects' characteristics namely; age, sex, marital status, years of experience, and educational level.

Part 2: Fever Management Knowledge Assessment tool: it included 30 questions related to Knowledge about physiology of thermoregulation (8 questions), pathophysiology of fever (9 questions), and nursing management of fever (13 questions).These questions are derived from extensive literature review and previous related studies. The structured questionnaire was in the form of multiple choice (20 questions) and true/false questions (10 questions). In addition, the questionnaire ended with an open ended question reflecting nurses' comments/opinions regarding their nursing management of fever. The Scoring system for the questionnaire had two alternative responses, the correct answer was given the score of "ONE" and the wrong answer was given the score of "ZERO. Based upon scoring system utilized, the knowledge level was categorized as follows: satisfactory level is ≥ 60% and unsatisfactory level was < 60%.

Tool 2: Nurses' Clinical Performance Observational Checklist: it was designed by the researchers to assess nurse's clinical performance of fever management. This section consists of 22 items related to observation of nurses' skills for fever management practices utilizing the nursing process as a frame work for data collection and checking of nurses' documentation of patients' care. It was distributed as follows; assessment (8 items), planning (3 items), implementation (8 items), evaluation and documentation (3 items). The Scoring system for the developed observational checklist had two alternative responses, ' correctly done' skill was given the score of "ONE" and 'not done' skill was given the score of

"ZERO". Based upon scoring system utilized, the performance level was categorized as follows: satisfactory level is ≥ 60% and unsatisfactory level was < 60%.

Content validity:

Face, content and concurrent validity for the previously mentioned tools were revised and ensured by five experts in medical surgical nursing and critical care nursing. Based on the experts' opinions responses, the researchers developed the final validated form of the tools.

Pilot study

A pilot study was done on 10 subjects to test clarity, applicability, understanding of language, and time needed for completing the tool. Few items were modified according to participants' responses in the pilot study. The subjects included in the pilot study were excluded from the whole study sample.

Reliability assessment:

The developed and validated tool for the knowledge was tested for reliability on a sample of 10 subjects. Test retest results using Alpha Cronbach revealed that all items are significantly differed and has a correlation coefficient above the threshold of significance (r=0.8). On the other hand, the alpha value for the performance checklist in the sample was (r=0.9).which indicating strong reliability of both tools.

Procedure:

Once permission was granted to proceed with the current study from responsible and authoritative parties at El-Manial university hospital, the researchers initiated data collection and contacted each potential nurse to explain the purpose and nature of the study. The researchers emphasized that participation in the study is entirely voluntary, the anonymity and the confidentiality of their responses were assured. Nurse participants were asked to sign a consent form .The fever knowledge questionnaire sheet was administered, the total time allowed to fulfill it by each nurse was 45 to 60 minutes. The time for collecting data through this tool from all nurses consumed about 2 weeks. After that, an observational checklist was utilized for each individual nurse three consecutive times, one week apart. The researchers observed all the studied nurses individually throughout morning and afternoon shifts using observational check list. The three times of observations of nurses' clinical performance and reviewing their documentation of patients' care took 6 months.

Ethical Consideration

Permission to conduct the proposed study was obtained from the authorities of critical care units at El-Manial University Hospital affiliated to Cairo

University. The researchers introduced themselves to nurses who met the inclusion criteria; the purpose and nature of the study was explained and then an informed consent was taken from participants who accepted participation in the study. The researchers emphasized that participation in the study is entirely voluntary; anonymity and confidentiality were assured through coding the data.

3. Results:

The collected data were tabulated, analyzed and presented in five main parts including: 1st part subjects' characteristic; 2nd part the subjects' knowledge; 3rd part subjects' clinical performance; 4th part the relation between subjects' knowledge and clinical performance, and 5th part subjects' comments/opinions regarding knowledge and management of fever.

Part I- Subjects' Characteristics

As can be seen from table (1), the majority of studied sample (77.15%) was females. Their age ranged between 20 to more than 30 years with mean age of 30 ± 6.7. , more than half (58.58%) were not married .In reference to the level of education; the subjects were mostly baccalaureate degree (68.57%). Related to the years of experience, the majority of the studied sample (75.72%) had more than 6 years of experience, and the highest percentage of subjects (45.72%) were working in medical critical care unit.

Part II- Subjects' knowledge about fever:

Figure (1) presents distribution of knowledge score about fever management among studied sample. It shows that the majority of studied sample (82.86%) and (77.15%) had unsatisfactory knowledge about physiology and management of fever respectively; while all participants (100%) had unsatisfactory knowledge related to pathophysiology of fever.

Table (2) presents comparison of the mean knowledge sub items scores of fever management among different educational levels of nurses. It is apparent from the table that there is no significant statistical difference existed among them regarding physiology of fever, pathophysiology and management of fever (F= 1.0, P=0.4; F=1.28, P=0.3; F= 0.6, P=0.6 respectively).

Part III- Subjects 'clinical performance about fever management:

As can be seen from the table (3), that all participants in the studied sample (100%) monitor patient's temperature initially ; but didn't assess the presence of chills, diaphoresis and grade of fever (low / high); as well as the pattern of fever occurrence, assess   mucous membrane for dryness

and changes in muscle tone . Also all the studied sample reported that they do not assess subjective data for their febrile patients. Only (28.5%) assessed possible causes of fever for their assigned patients; and (42.8%) monitored level of consciousness for them. Related to planning of care for febrile patients; the study findings showed that all participants (100%) do not either formulate nursing diagnosis, prioritize patient's concerns or put therapeutic goals before nursing actions. Related to implementation, all participants (100%) didn't adjust or monitor environmental factors like room temperature. In addition, they do not administer an alternative antipyretic (e.g., Ibubrufen) if Paracetamol has been ineffective in lowering the temperature; also all participants didn't report or record their actions following facility policy. Regarding evaluation; all participants (100%) neither reassess hydration status, nor measure or record the urine output at time of fever.

Table (4) presents one way analysis of variance for the comparison of mean clinical performance scores of assessment, planning implementation and evaluation for the three consecutive observations among the studied sample. As can be seen from the table that no statistical significant differences existed among the mean performance scores (F= 1.8, NS1.0; F= 0.0, NS; F= 0.03, NS; F= 0.0, NS. respectively).

Part IV: The relation between subjects' knowledge and clinical performance:

Table (5) presents the relationship between knowledge scores and performance for the three consecutive observations regarding fever management among studied sample 1st observation (r = -0.057, P=0.6); 2nd observation (r = 0.045, P =0.7); 3rd observation (r = -0.01, p=0.2). It is apparent that there is no significant statistical difference between total knowledge scores and clinical performance scores among studied sample (r =-0.01, p=0.9).

Part V: subjects' comments/opinions regarding knowledge and management of fever:

 As can be seen from the table **(6)** that all participants (100%) start management of fever only if the patients' temperature becomes 38.5 ºC. or more. Moreover, some of the participants (71.42%) mentioned that they have unsatisfactory knowledge; and the same percentage their opinion was that they know the management but have no time to manage fever. Finally, some participants (42.8%) reported that they are not satisfied with the current management and only do what the doctor says or prescribe.

Table (1): Distribution of Socio-Demographic and educational background Data among studied sample (n=70).

| Variables	N	%
Gender		
- Male	16	22.85
- Female	54	77.15
Age		
- 20 less than 25	20	28.57
- 25 less than30	31	44.28
- ≥30	19	27.15
mean± SD	30 ± 6.7	
Marital status		
- Married	29	41.42
- Not married	41	58.58
Level of education		
- Secondary nursing school diploma	18	25.70
- Post secondary technical diploma	4	5.73
- Baccalaureate (BSc.N)	48	68.57
Years of experience		
- 0 - 5	17	24.28
- 6 –10 years	42	60.00
- >10 years	11	15.72
Area of work		
- Medical critical care	32	45.72
- Coronary care unit	16	22.85
- Emergency critical care	11	15.72
- Surgical critical are	7	10.00
- Stroke critical care unit	4	5.71
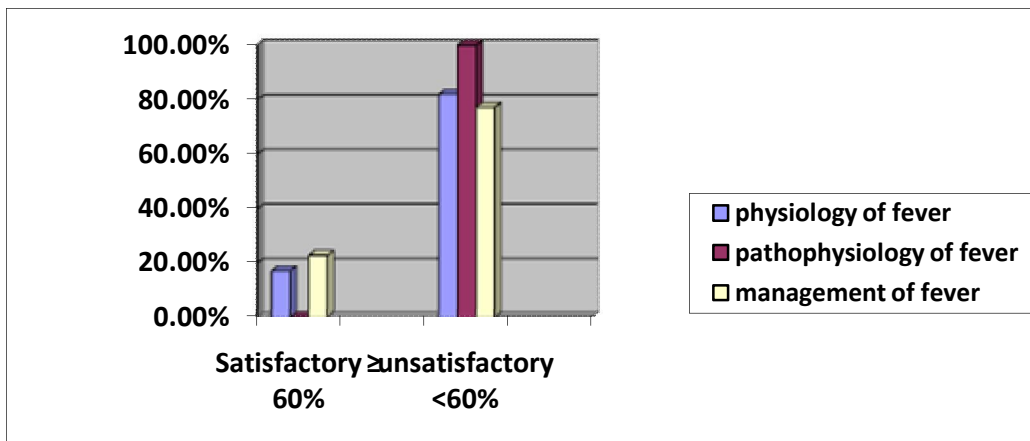
Figure (1): Distribution of knowledge score about fever management among Studied sample (n=70).

Table 2: Comparison of means of knowledge scores about fever management by educational level among studied sample (N=70).

Knowledge score about fever	Educational level						F. test	P -value
	Secondary nursing school diploma		Post secondary technical diploma		Baccalaureate (BSc.N)			
	Mean	SD	Mean	SD	Mean	SD		
Physiology of fever	3.5	+0.6	3.5	+ 1.0	3.77	+0.95	1.0	0.4 (NS)
Pathophysiology of fever	3.6	+0.7	4.2	+0.9	3.95	+0.71	1.28	0.3 (NS)
Management of fever	6.1	+1.2	6.7	+ 1.7	6.41	+1.91	0.6	0.6 (NS)

(NS)= not significant

Table (3): Frequency and percentage of nurses' clinical performance scores regarding fever management among studied sample (n=70)

item	Done correctly N (%)	Not done N (%)
1-Assessment		
Objective data		
1- Assess and monitor patient's temperature	70 (100)	0 (0 %)
2- Note for presence of chills/ profuse diaphoresis & grade of fever (low/high)	0 (0)	70(100)
3- Note the pattern of occurrence (sustained/remittent/intermittent)	0 (0)	70(100)
4- Assess mucous membranes for dryness & skin turgor	0 (0)	70(100)
5-Assess possible causes of fever	20 (28.5)	50(71.4)
6-Monitor for changes in level of consciousness,	30 (42.8)	40(57.1)
7-Assess changes in muscle tone	0 (0)	70(100)
Subjective data		
8- Ask patient for comorbid symptoms, Feeling cold / restless /nausea /vomiting /headache/ diarrhea/productive cough/dyspnea/dizziness/	0 (0)	70 (100)
2-planning		
1-Identify priority of patient's concerns.	0 (0)	70 (100)
2-Put therapeutic goal before an appropriate nursing action can be selected	0 (0)	70 (100)
3- develop individualized nursing care plan	15 (21.42)	55 (78.5)
3-implementation		
1- Apply a thin blanket and avoid rapid removal of clothes	20 (28.5)	50 (71.4)
2-Adjust and monitor environmental factors like room temperature	0 (0)	70 (100)
3- Administer antipyretic medication in low grade fever at 37.5^0 -38.8^0 C & Document rationale for antipyretic administration	20 (28.5)	50 (71.4)
4- Use and select a number of methods to cool down patients who have fever after 20 minutes of antipyretic medication ,	20 (28.5)	50 (71.4)
-or Apply tepid sponge bath in high grade fever (38.5^0 -39^0 C)	20 (28.5)	50 (71.4)
- or Administer an alternative antipyretic (eg., Nurofen) if Paracetamol has been ineffective in lowering the temperature	0 (0)	70 (100)
-or Provide cooling blanket / ice packs especially with temperatures of 39.5^0C – 40^0C	25 (35.7)	45(64.28)
- or apply cold gastric lavage/ cold enema in patient with hyperthermia ($> 40^0$ c)	2 (2.85)	68(97.14)
5-Measure temperature every 15 minutes	10 (14.28)	60 (85.7)
6- Increase fluid intake if not contraindicated	10 (14.28)	60 (85.7)
7-Apply a lubricant to dried lips and keeping mucous membranes moist	0 (0 %)	70 (100)
8- Report and record actions following facility policy. Include: a. Site involved b. Length of time treatment is given c. Response to treatment d. Observation of skin	0 (0) 0 (0) 0 (0) 0 (0)	70 (100) 70 (100) 70 (100) 70 (100)
4-Evaluation		
1-Reassess temperature every 15 minutes and observe the antipyretics effect.	10 (14.28)	60 (85.7)
2-Reassess hydration status and skin turgor	0 (0)	70 (100)
3-Measure / record the urine output and Specific gravity at time of fever	0 (0)	70 (100)

Table (4): One way analysis of variance for the comparison of mean clinical performance scores for the three consecutive observations among the studied sample (n=70).

Item of comparison	Participants' performance						F. value	P value
	First observation		Second observation		Third observation			
	Mean	±SD	Mean	±SD	Mean	±SD		
Assessment	2.35	0.7	2.31	0.5	2.27	0.5	1.8	0.1 (NS)
Planning	0.21	0.41	0.21	0.41	0.21	0.41	0.00	NS
Implementation	3.12	0.84	3.27	0.65	3	0.37	0.03	0.3 (NS)
Evaluation and documentation	0.1	0.3	0.1	0.3	0.1	0.3	0.00	NS

(NS)= not significant

Table (5): Relationship between total fever knowledge scores and clinical performance scores among studied sample (n=70).

variable	Participants' performance							
	First observation		Second observation		Third observation		Average of observations	
	r- test	p- value	r- test	P- value	r -test	P- value	r - test	P- value
Total knowledge scores	-0.057	0.64 (NS)	0.045	0.7 (NS)	-0.01	0.2 (NS)	-0.01	0.9 (NS)

(NS)= not significant

Table (6): Participants' Opinions/comments regarding current knowledge and management of fever among studied sample (n=70).

Participants' Opinions/Comments*	N	%
-Only manage if the patient becomes 38.5^0 C or more	70	100
-Only do what the doctor says or prescribe	30	42.8
-We are not satisfied with current management	30	42.8
-Our knowledge are insufficient	50	71.42
-We know the management but we have no time to apply	50	71.42
-No specified protocol for fever management	4	5.71
-We are satisfied with current management	4	5.71
-Fever management should proceed gradually	4	5.71
-Do not always approve of pharmacological management	5	7.14
-Reliance on policies and procedures rather than openness to change.	5	7.14

*more than one answer allowed

4. Discussion:

The following discussion focus upon the findings related to the stated research questions of the study. Discussion is presented in the following sequence: (a) nurses ' knowledge, (b) nurses' performance and(c) Relationship between the nurses' knowledge and practice.

The current study results revealed that all critical care nurses with different educational levels, irrespective of their years of experience or area of work had unexpectedly unsatisfactory knowledge scores about physiology of thermoregulation, pathophysiology and management of fever. Similar findings were reported by **Greensmith (2012), Considine, & Breman (2007), Edward et al., (2007), Khalifa (2007), Walsh, etal., (2006), and Sophia (2003)** who identified that nurses' mean knowledge score about the physiology of fever, fever management and antipyretics was lower than expected. These results were also coinciding with **Leaton (2010)** who mentioned that most nurses lacked knowledge about fever that associated with an infective process that requires cultures to be obtained. Therefore, **Sophia (2003)** study findings recommended the inclusion of the physiology of thermoregulation, the pathophysiology and the management of fever in the curriculum of the undergraduate nursing students and all learning programs for health care professionals.

The unsatisfactory nurses' knowledge in the current study, may be due to the absence of in-service training programs in fever management and the absence of formal hospital policies for fever management were clear in these critical care units. These results were in agreement with **Thompson (2005),** who thought that the concept of fever was unclear in nursing protocols for fever management.

In the present study, the results obtained from the checklists regarding the utilization of the nursing process in fever management for critically ill patient revealed that; the assessment of the patient with fever or the potential to develop fever was not always recorded in the documentation. Accordingly, no nursing diagnosis was formulated. As evident by observation of the performance of the studied subjects and patient documentations as well, the implementation of care showed inconsistency in terms of frequency measuring and recording of the patient temperature in the different shifts and for different patients.

The implementation of care which carried out by the studied sample, the recommended frequent and regular assessment of temperature was not done and cooling patient after administering antipyretic medications, purposeful bathing patients in high grade fever and increasing fluid intake if not contraindicated are measures not provided by all participants. **Thompson et al., (2007) and Stochetti et al.,(2002)** reported that the care was confined to erroneous fever management practices as the continued use of cold water compresses, or cold showers that could lead to shivering and more heat production combined with administering oral paracetamol randomly irrespective of grade and onset of fever; these interventions have to be ineffective in the majority of traumatic brain injury patients and

may actually be contraindicated as they could induce shivering ,increasing metabolic rate and decreasing cerebral oxygenation . Therefore**,(Holtzclaw, 2002)** reported that interventions chosen by nurses were frequently based on individual conventions rather than evidence-based practice. Moreover, **Leaton (2010)** emphasized that most critical care nurses' managed fever by a variety of interventions not based on a protocol.

Finally, nurses' evaluation of the effect of nursing care and antipyretics on the patient outcome was not done by all participants and not documented. These findings would be in accordance with **Watts et al., (2001),** who mentioned in his study that the audit of nursing practices has highlighted a deficit in nurses' documentation practices and a lack of clarity in the ordering of medications that have dual actions, i.e., antipyretic and analgesic. The systematic review of fever management also recommended that the purpose, when intervening in fever management, must be clearly identified through documentation

These findings may be interpreted in light of **Ferguson, (2007)** who found that assessment and management of fever were steeped in habits and teaching from the past. She added that research evidence suggested that if treating fever was not based on accurate evidence then the use of drugs would have little effect both on the course of disease and the wellbeing of the patient. As well, **Edwards et al., (2007)** identified that neuroscience nurses who encountered this common problem face a traditional gap between patient-outcomes research and bedside practice because there was no current evidence-based standard of care for fever management. Thereby, pharmacological methods such as paracetamol may be administered erroneously.

International studies conducted in US, Sweden and Australia reported a lack of consistency in the way nurses described fever and its management **(Edwards et al., 2007, Walsh et al. 2006, Emmoth&Mansson ,1997)**. On the other hand, in Egypt, studies conducted by **Mohamed (2010), Abd El-Raheem (2007), Khalifa (2007), and Sliman (2005),** revealed that nurses have adequate knowledge but not adherent with evidence based guidelines in clinical practice. Therefore, there is a gap between what is already known and what is really done.

There are other variables and factors that may be closely related to the knowledge and practice such as years of experience and educational level, i.e. the higher educational level and the more years of experience, the better knowledge and the practice. However this study finding unexpectedly revealed there is no correlation what so ever between knowledge and clinical performance and between

knowledge and educational level, and years of experience. These study findings may be interpreted partially in the light of **Thomboson (2007)** study which revealed that no improvement in clinical practice over 10 years despite increased attention to this issue and publication of guidelines. There remains a gap in translation between patient outcomes research and bedside nursing practice that needs to be overcome. As bedside nurses make independent decisions in this regard, research efforts need to focus on understanding their decision-making processes.

Therefore, Lack of knowledge and practice regarding fever management as noticed through empirical observation and previous studies has prompted the researchers to study the critical care nurses' opinions/comments regarding current fever management practices in their work areas. The results of the present study showed that most of nurse participants reported that they have insufficient knowledge, have no time due to workload, not satisfied with the current management, reliance on policies and procedures rather than openness to change and do what the doctor says.

Results of present study in this regard supported by the findings of **Thompson and Kagan,(2011)**who emphasized that institutional protocols may provide barriers to implementation of evidence-based practice and need to be examined carefully. It is hoped that armed with this knowledge, the evidence-based protocols can be developed and tested for fever management in different patients that are both valuable to and fully-implemented by critical care nurses.

In conclusion, the findings suggest that improvements are needed in the knowledge and management practices regarding fever among critical care nurses through a continuing education programs based on scientific evidence.

Recommendations:
Based on the results of the present study, the following recommendations are suggested:
-   The need for in- service education and integration of clinical practice guidelines regarding fever assessment and management.
-   Ward-based compulsory seminars or workshops are considered an ideal educational tool to Improve fever management practices
-   Developing a standardized protocol of care for febrile patients in ICU.
-   Examine the barriers of documentations. Finding a common language in nursing documentation is essential. Therefore Suggestions were made for improvement such as automatic documentation prompts in the electronic medical record.

- Replication of this study to involve fever management among nurses caring for other vulnerable patients as cancer or burn patients is necessary to determine

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