Nurses' Knowledge and Practices regarding to Fever Management of Neonates

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Abstract

Background: Nurses in Neonatal Intensive Care Unit operate in a challenging environment with the demands of care of the infant and providing family-centered care. **Aim of the Study**: The present study aimed to assess nurses' knowledge and practice regarding to fever management of neonates. **Study Design**: **A descriptive exploratory study** design was utilized. **Setting**: The study was carried out at the neonatal intensive care units in Benisuef General Hospital, Benisuef Health Insurance Hospital affiliated to Ministry of Health and Ain Shams (Children's Hospital) affiliated to Ain shams University Hospitals. **Subjects**: A convenient sample of 50 nurses providing care for neonates at the previously mentioned settings were selected in the current study, regardless their age, years of experiences or qualifications. **Tools of the Study**: Involved nurses' structured interview questionnaire to assess the study sample's demographic characteristics and their knowledge regarding management of fever in neonates and nurses' observational checklist to assess nurses' practice toward fever management in neonates. **Results**: It was clear that the majority of the studied nurses had unsatisfactory knowledge level and nearly two thirds of them, were incompetent in practice regarding fever management of neonates. Also, there was a statistically significant difference between total nurses' knowledge and their total practice. **Conclusion**: It can be concluded that there was unsatisfactory level of nurses' knowledge and practice regarding fever management of neonates. **Recommendations**: Raising awareness of nurses regarding fever management of neonates and improving their knowledge and practices through continuous training programs.

Introduction

Thermal protection of the newborn remains a global concern and a challenge for health care providers (**Knobel, & Holditch-Davis 2007**). Heat regulation is most critical to the newborn's survival (**Zingaretti, et al., 2009**). Although concern is usually for newborn's ability to conserve heat, they may also have difficulty dissipating heat in an overheated environment, increasing the risk of hyperthermia (**Brown, 2015**).

A neonate with fever is a very common presentation to pediatric emergency departments, urgent care centers and primary care offices. The source of fever is not

always apparent and clinical exam alone cannot reliably predict serious illness in neonates (**Laupland, 2009 & Royal College of Nursing 2015**). The most common cause of fever is usually a self-limited viral infection but neonates are at a high risk of serious bacterial infections (SBI)**.** Febrile illness in neonates is common and has potentially serious consequences. (**Jennifer, 2013**).

There is a need for nursing support to assist parents of ill infants. Nurses are in a position to influence caregiver's abilities to cope with stressors and to become effective parents. Interpersonal communication is one principal tool used to trade information between health professionals, patients, and families (**Smitherman & Macias, 2015**)

As the professional voice of neonatal nurses, the National Association of Neonatal Nurses (NANN) recommends that subspecialty neonatal intensive care units (Level II, III, and IV NICUs) be staffed with a sufficient number and an appropriate mix of qualified registered nurses to attend to the emergent and complex care requirements of critically ill and convalescent neonates. This staffing should accord with the latest available evidence on achieving safe outcomes for this population (**National Association of Neonatal Nurses 2014**).

Significance of the Study

The care and treatment of neonates with fever occupies a considerable amount of time for many nurses. But despite this extensive experience with fever, there are important questions about fever that are unanswered and even healthcare professionals have misconceptions about the adverse effects of a fever and about when and how a fever should treated. Therefore, the most recent evidence based practice should be used (**Demir & Sekreter, 2012, Schortgen, 2012 & Bartlett, 2013**).

The neonatal nurse is the primary decision maker regarding antipyretic interventions, regardless of whether an evidence-based protocol exists in a particular clinical setting. Therefore, it is important to gain a clearer understanding of the rationale for intervention choices made by nurses in response to fever and to identify issues related to fever management for neonates in NICU. Factors influencing practice included lack of evidence-based knowledge and inconsistent beliefs about benefits of fever (**Helen et al., 2007**).

The need for immediate assessment, septic workup and treatment for the neonate infants with fever must be recognized as the neonatal condition can deteriorate quickly. It is important that the nurse caring for neonates be aware of management of fever of neonates (**Asher & Northington, 2008**).

Aim of the study

The current study aimed to assess knowledge and practice of nurses regarding fever management of neonates.

Research question:

Are the neonatal nurses having a satisfactory level of knowledge and practice regarding fever management of neonates?

Subjects and Method

Research design:

A descriptive design was utilized in this study.

Setting:

The study conducted at the neonatal intensive care units in Benisuef General Hospital, Benisuef Health Insurance Hospital affiliated to Ministry of Health and

Children's Hospital affiliated to Ain shams University Hospitals.

Sampling*:*

A convenient sample included all available staff nurses' (50 nurses) providing care for neonates in the above mentioned settings regardless their ages, years of experiences or qualifications.

Tools and data collection:

1. Nurses' structured interviewing questionnaire. It was designed by the researcher based on scientific literature review to gather data about characteristics of nurses (such as age, sex, qualifications and years of experience) and nurses' knowledge regarding fever management in neonates (definition, manifestation, causes, complications of fever, ……etc.).

➢ **Scoring system**

1- Items of nurses' knowledge assessment about fever of neonates and management of fever consisted of 32 questions as closed and open ended questions. The total score was 40 scores that were distributed according to the importance of each item. According to nurses' responses their total level of knowledge scores was classified into satisfactory score for knowledge (≥ 80%) and unsatisfactory score for knowledge (<80 %).

Content validity:

The questionnaire was assessed and ascertained by a panel of five experts in paediatric nursing to validate its format, layout, consistency, accuracy and relevance.

2. Nurses' observation checklists adopted from Bowden and Greenberg (2012) to assess the nurses' practices regarding fever management in neonates as the following:

a. Axillary temperature to assess nurses' practice in measuring axillary temperature of neonates that contains 7 steps which were checked either done competent (1 score) or incompetent (0 score). The total scores were 7.

b. Rectal temperature to assess nurses' practice in measuring rectal temperature of neonates that contains 10 steps which were checked either done competent (1 score) or incompetent (0 score). The total scores were10.

c. Sponge bath Checklist that consisted of 17 steps which were checked either done competent (1 score) or incompetent (0 score).

d. Tub bath Checklist that consisted of 12 steps which checked either done competent (1 score) or incompetent (0 score). The total scores were 12.

e. Antipyretic orally medication administration that consisted of 13 steps which were checked either done competent (1 score) or incompetent (0 score). The total scores were 13.

f. Antipyretic parentrally (Intravenous) medication administration that consisted of 20 steps which were checked either done competent (1 scores) or incompetent (0 score). The total scores were 20.

Ethical considerations:

All nurses' rights were secured. They were informed that the given information used only for research purpose. A clear, simple clarification of the study nature and its expected outcomes was explained to each study subject. The anonymity and confidentiality had been assured also. The study subjects had the right to withdraw from the study at any time. The research approval

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was obtained from Ethical Research Committee, Faculty of Nursing, Ain Shams University.

Pilot study:

A pilot study was carried out including 10% (five nurses). The result of the data obtained from the pilot study helped in modification of the study tools, where some items were corrected, omitted and added as necessary. All the nurses involved in the pilot study were excluded from the study sample.

Field work:

The actual field work was carried out over 6 month's period from the first week of December of 2016 up to the end of June 2017. The researcher was available at practice time, three days per week throughout the three shifts for data collection to assess nurses' knowledge and actual practice.

Every nurse was interviewed and asked to fill the questionnaire of knowledge within 20 minutes. Every nurse was assessed, observed using the study tools which filled by the researcher during providing care for neonates with fever. Time consumed for assessing each procedure taken nearly 20-30 minutes.

Administrative design:

An official permission was obtained from the administrators of the study setting through a formal letter that was issued from the Dean of the Faculty of Nursing, Ain Shams University. An oral written approval to carry out the study was taken from each nurse.

Statistical analysis:

The collected data were organized, tabulated, categorized and statistically analyzed by using computer program (SPSS) version. Data were presented in tables as numbers and percentage. Mean and standard deviation, Chi-square test was used to estimate the statistical significant difference between variables of the study. No Significance if $p > 0.05$ and significance if $p < 0.05$.

Result

Table (1): illustrates that, 42.0% of the nurses were aged ≥ 30 years, with mean age 28.1 ± 8.4 and 52.0% of them had nursing diploma "Secondary School Education". In addition, 38.0% of the nurses had more than 10 years of experience with the mean years of experience 12.4 ± 5 and also, 74.0% of them didn't attain any previous training programs about fever in neonates.

Table (2): shows that, 86.0% of the studied sample had unsatisfactory knowledge regarding fever management of neonates.

Table (3): shows that, 60% of the studied nurses had incompetent practices level.

Table (4): clarify that, there was highly statistically significant difference between nurses' knowledge and educational level (X^2=**13.49**) & p–value (0.001).

Table (5): shows that, highly statistically significant difference between nurses' practice and their age and years of experience with statistically significant difference between nurses' practice and their educational level (X^2=10.00**,** 12.30 & 7.01) and p–value (0.006**,** 0.002 &0.029) respectively.

Table (6): shows highly statistically significant relation between total knowledge of the studied nurses and their total practice (X2=7.10 & p=0.007).

Table (1): Number and percentage distribution of the studied nurses according to their characteristics (n=50).

Items	No	%
Setting		
Ain Shams Children's Hospital	**15**	30.0%
Benisuef general Hospital	**25**	50.0%
Benisuef Health Insurance Hospital	**10**	20.0%
Age in years		
20-< 25	15	30.0%
25 -< 30	14	28.0%
≥ 30	21	42.0%
$\bar{x} \pm SD = 28.1 \pm 8.4$		
Educational level		
Diploma	26	52.0%
Technical Institute	20	40.0%
Other	4	8.0%
Years of experience		
< 5	18	36.0%
5-< 10	13	26.0%
≥ 10	19	38.0%
$\bar{x} \pm SD = 12.4 \pm 5.3$		
Previous Training Attainment		
Yes	13	26.0%
No	37	74.0%

Table (2): Number and percentage distribution of nurses according to their total knowledge score regarding fever management of neonates (n=50).

Total knowledge	Satisfactory		un satisfactory	
	No	%	No	%
	7	14.0%	43	86.0%

Table (3): Number and percentage distribution of nurses according to their total practice regarding fever management of neonates (n=50).

performance	Competent		In competent		Mean	SD
	NO	%	NO	%		
Axillary and rectal temperature	19	38.0%	31	62.0%	5.6	1.6
Sponge and tube bath	20	40.0%	30	60.0%	8.9	1.6
Antipyretic orally and parenterally	24	48.0%	26	52.0%	12.6	3.2
Total	20	40.0%	30	60.0%	27.0	3.6

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Table (4): Relation between characteristics of the nurses and their total knowledge regarding fever management of neonates (n=50).

Items	Knowledge			
	Satisfactory		**Unsatisfactory**	
	No	**%**	**No**	**%**
Setting				
Ain Shams Children's Hospital	2	4.0%	13	26.0%
Benisuef general Hospital	3	6.0%	22	44.0%
Benisuef Health Insurance Hospital	2	4.0%	8	16.0%
X^2			**0.39**	
P-value			**0.824**	
Age				
20-< 25 years	3	6.0%	12	24.0%
25 -< 30 years	3	6.0%	11	22.0%
$\geq$ 30 y years	1	2.0%	20	40.0%
X^2			**2.58**	
P-value			**0.275**	
Educational level				
Diploma	2	4.0%	24	48.0%
Technical Institute	2	4.0%	18	36.0%
Other	3	6.0%	1	2.0%
X^2			**13.49**	
P-value			**0.001****	
Years of experience				
< 5	3	6.0%	15	30.0%
5-< 10	3	6.0%	10	20.0%
$\geq$ 10	1	2.0%	18	36.0%
X^2			**2.20**	
P-value			**0.333**	
Previous Training Attainment				
Yes	2	4.0%	11	22.0%
No	5	10.0%	32	64.0%
X^2			**2.86**	
P-value			**0.091**	

Table (5): Relation between characteristics of the nurses and their total practice regarding fever management of neonates (n=50).

Items	Total Practice			
	Competent		Incompetent	
	No	%	No	%
Setting				
Ain Shams Children's Hospital	**6**	12.0%	9	18.0%
Benisuef general Hospital	**9**	18.0%	16	32.0%
Benisuef Health Insurance Hospital	**5**	10.0%	5	10.0%
X^2		0.58		
P-value		0.740		
Age				
20-< 25 years	9	18.0%	6	12.0%
25 -< 30 years	8	16.0%	6	12.0%
≥ 30 years	3	6.0%	18	36.0%
X^2		10.00		
P-value		0.006		
Educational level				
Diploma	6	12.0%	20	40.0%
Technical Institute	11	22.0%	9	18.0%
Other	3	6.0%	1	2.0%
X^2		7.01		
P-value		0.029		
Years of experience				
< 5	9	18.0%	9	18.0%
5-< 10	9	18.0%	4	8.0%
≥ 10	2	4.0%	17	34.0%
X^2		12.30		
P-value		0.002		
Previous Training Attainment				
Yes	6	12.0%	7	14.0%
No	14	28.0%	23	46.0%
X^2		0.27		
P-value		0.590		

Table (6): Correlation between nurses' total knowledge and their total practice regarding fever management of neonates (n=50).

Items	Knowledge					
	Satisfactory		Unsatisfactory		X^2	P-value
	No	%	No	%		
Performance						
Competent	**6**	12.0%	14	28.0%	7.10	0.007
Incompetent	**1**	2.0%	29	58.0%		

Discussion

Fear of fever can lead to aggressive and dangerous practices, including overdosing with antipyretics and sponge bathing with alcohol. There is a need for pediatric nurses to understand the physiology of the febrile response as well as common misconceptions regarding fever in order to promote safe and evidence based fever management for their neonates (**Patricia, 2014**).

The findings of the present study indicated that the majority of nurses had unsatisfactory knowledge regarding to fever management of neonates. This might be due to the absence of in-service training programs in fever management and the absence of formal hospital policies for fever management. This finding was in agreement with **Khalifa (2007)** who studied the impact of an educational program based on evidence related to fever management and found that there was shortage of nurses' evidence–based knowledge related to fever. **Abouzaid (2014)** mentioned that nurses' knowledge regarding TPN was unsatisfactory in most of nurses. This finding also supported with **Leaton (2010),** who mentioned that most nurses lacked knowledge about fever that associated with an infective process that requires cultures to be obtained.

Regarding total nurses' practice regarding to fever management of neonates, it was observed from the current study that, nearly two thirds of the studied sample had incompetent level of practice. This may be due to shortage of staff, work overload, and limited hospital supplies. This result was supported with **Khalifa (2007)** who reported that incorrect practices related to management of fever was recorded. This was reflected by their continuing use of cold compresses, application of alcohol and vinegar on skin of feverish children, and frequent administration of cold water showers to feverish children. Also **Sadek (2010)** who studied the evidence-based

guidelines for nursing care of neonates with respiratory distress and mentioned that nurses' performance regarding care of neonate with respiratory distress, was incompetent in most of nurses. **Abouzaid (2014)** stated that nurses' performance regarding **TPN** was incompetent in most of nurses and improved after implementation of program. **Thompson et al., (2007)** 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. **Carayon et al., (2007)** stated that the heavy workload of hospital nurses is a major problem in health care system. Nurses are experiencing higher workload than ever before this main reasons which are increased demand for nurses reduced staffing & increased overtime, and reduction in patient length stay.

Regarding correlation between the study variables it was observed that, there was statistically significant difference between total knowledge and total practice of the studied nurses. This agreed with **Abou-Zaid (2014) and Sadek 2010** who stated that there was statistically significant difference between total knowledge and total practice of the studied nurses. And also, agreed with **Hegazy 2014** who studied Nurses' knowledge versus their performance in caring for neonates having respiratory distress syndrome and found that, there was statistically significant difference between total knowledge and total practice of the studied nurses.

Conclusion

This study concluded that, there was un satisfactory level of nurses' knowledge regarding fever management of neonates where, the majority of nurses had unsatisfactory level of knowledge and nearly two thirds of them had incompetent level of practice. In addition, there were statistical

significant difference between total knowledge and total practice.

Recommendations

This study recommended to:

1. An orientation program should be developed for newly appointed nurses to prepare them before working at neonatal intensive care units.
2. Periodical continuous on job training programs for neonatal nurses to refresh and improve their knowledge and performance.
3. Provide procedure book based on evidence based practice containing all nursing activities especially for fever management of neonates in neonatal intensive care units.
4. Establish evaluation system to monitor the nursing performance at neonatal intensive care units.
5. Further studies should be conducted to improve nurses' knowledge and performance regarding nursing management of fever in neonatal intensive care units.

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Conflict of interest:

No   Yes

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