

Enhancement of Nurses' Performance Regarding Care of Newborns at NICUs: An Assessment Study

Monera Sayed Mohamed Farag¹, Wafaa El-Sayed Ouda², Eman Amin Mohammed³

¹MSc., Pediatric Nursing, ^{2,3}Professor of Pediatric Nursing
Pediatric Nursing Department - Faculty of Nursing - Ain Shams University

Abstract

Aim: To enhance nurses' performance regarding care of Newborns in NICUs. **Design:** A descriptive design was used. **Settings:** The study was conducted at NICUs in both Maternity and gynecology and Pediatric Hospital that affiliated to Ain shams university hospitals. **Sample:** A convenient sample of 70 nurses, from the previously mentioned settings during the period of 1 year. **Tools:** Two tools were used to collect data namely: A structured interviewing questionnaire and standardized observational checklists to assess nurses' knowledge and practice regarding care of newborns at NICUs. **Results:** The study findings revealed that the competent core are implemented for newborns estimated at around (47.1%) while incompetent (52.9%) of studied sample knowledge regarding care of newborns and that the competent core are implemented for newborns estimated at around (62.9%) while incompetent (37.1%) of studied sample practice regarding care of newborns. there was a highly statistically significant relation between total studied sample knowledge regarding care of newborns at NICUs and their age and attending training courses at level . Also, there was a statistically significant relation between total nurses' knowledge regarding care of newborns at NICUs and their experience While there was a statistically insignificant relation between total nurses' knowledge and their gender, qualification and social condition and shows that there was statistically insignificant relations between total nurses' practices and their characteristics. **Conclusion:** The study concluded that the competent core are implemented for newborns estimated at around (47.1%) while incompetent (52.9%) of studied sample knowledge regarding care of newborns and that the competent core are implemented for newborns estimated at around (62.9%) while incompetent (37.1%) of studied sample practice regarding care of newborns. **Recommendations:** The study recommends continuous assessment and upgrading of nurses' knowledge and practices regarding care of newborns at NICU and Conduct educational programs to improve nurses' performance at NICU based on their actual need assessment.

Key words: Neonatal Intensive Care Units, Pediatric, Nurses, Competent Core.

Introduction

The Neonatal Intensive Care Unit (NICU) is an intensive care unit specializing in the care of ill or premature newborn infant. Neonatal refers to the first 28 days of life, the Neonatal Intensive Care Unit (NICU) constitutes a therapeutic environment appropriate for treatment of newborns (NB) in a serious condition. The increasing implementation of high risk procedures and the low tolerance to medication errors are some nursing professionals concerns when working in the NICU. The constant interaction with the family members of newborns requires training of the health (*Berger et al., 2018*).

Nursing care for neonates in the neonatal units has become more detailed and complicated and considered a critical element in the neonate's chance for survival, so highly skilled nurse should have a power of observation and the ability to take accurate decision, rapid management and to evaluate any complications to help for efficient, excellent neonatal outcomes (*Spence, 2011*).

The Intensive Care Unit (NICU) is distinguished by a variety of emotional stressors and tasks. Based on the neonates and the family, the care is comprehensive. The medical strategy and the staff's interaction with the parents of the neonates receiving care must both support during the hospital stay (*Dutta et al., 2015*).

Adequate nurse staffing levels are a fundamental prerequisite for satisfactory neonatal care. The appropriate nurse neonate ratio is

very important to maintain acceptable standard of care to decrease the mortality and to meet the changing health need of the neonates. International council of nurses defines the safe staffing as the appropriate number and skill mix of nursing personnel on duty at any time, which is critical to patient outcome. Staffing level in the specific setting like neonatal intensive care units should give due consideration to critical factors like the number of neonates and level of intensity of neonatal needs (*Harper, 2018*).

Significance of the Study

An increased rates of premature and low birth weight newborns as well as associated factors with high risk pregnancies, the number of infants who require admission to neonatal intensive care units (NICU) is growing (*Malusky and Donze, 2011*). Along with the increasing complexity of technology and the development of the NICU, the survival of these newborns has improved. A major share of the responsibility for such care practices is related to the nurses working in the NICUs (*Phibbs et al., 2007*).

Aim of the Study:

Assess nurses' performance regarding care of Newborns in NICUs.

Research questions:

- What is the level of nurses' knowledge and practice at the neonatal intensive care unit?
- Is there a relationship between nurses' characteristics and their practice at neonatal intensive care unit?

Subjects and Methods

A descriptive design was utilized in carrying out this study to assess competency of nurses' performance regarding care of Newborns at NICUs.

The subjects and methods for this study are categorized under four main designs as the following:

- I. Technical design.
- II. Operational design.
- III. Administrative design.
- IV. Statistical design.

I. Technical design.

Research design:

A descriptive research design was utilized in the current study.

Research setting:

This study was conducted at Maternity and Gynecological hospital and Pediatric Hospital affiliated to Ain sham Hospitals / Cairo/ Egypt.

Research subjects:

A purposive sample of 70 nurses working at the previously mentioned setting, regardless their characteristics.

Tools for data collection:

I- A predesigned interviewing questionnaire format: It was developed by the researcher based on related literature review and covered the following parts:

Part 1: Characteristics of the nurses (age, qualification, years of experience and attending training courses in NICU).

Part 2: Nurses' knowledge regarding competency based care of newborns.

II- Standardized observational checklists: that were used to assess nurses' practices for newborns in NICUs (Newborn admission, hand

washing, vital signs, medication administration, nutrition, urinary catheter care, oxygenation, respiratory suctioning and diagnostic measures competency based practice) **Dryfus Rating Scale, (1980).**

Scoring system: According to nurses' knowledge and practice, the score of 80% and more was considered competent of nurses' competencies skills, while less than 80% was considered as incompetent of nurses' competencies skills.

Content validity and reliability: Content validity of the study tools was assessed by Jury of 3 experts in the field of the study and reliability of the tools was tested by using appropriate statistical tests (No and %, \pm SD, X^2 and t-test)

Operational design.

1- Preparatory phase:

A review of the current and past available literatures to be aware with the various aspects of the research problem using books, articles, periodicals, websites and magazines.

2- Pilot study:

Pilot study was carried out involving 10% of the expected size to test the usability, clarity and time needed to fill study tools. According to the results of the pilot study, the necessary modifications was carried out with exclusion of neonatal nurses participated in the pilot study later from the study sample.

3- Field of work:

The researcher was available in the study setting 3days/week through morning and afternoon

shifts to gather data from April 2020/2021 where 4 nurses were interviewed daily using the previously mentioned tools (30-45 minutes for each nurse).

II. Administrative design

The ethical research committee, the nursing faculty, and Ain Shams University all approved the study. The study's objective and purpose are made apparent to each subject by the researcher, and it is safe. The researcher protects the subjects'

privacy and anonymity. Subjects have the freedom to participate or not at any time without consequence.

III. Statistical design

Recorded data were analyzed using the statistical package for social sciences, version 22.0 (SPSS Inc., Chicago, Illinois, USA). Quantitative data were expressed as mean \pm standard deviation (SD). Qualitative data were expressed as frequency and percentage.

Results:**Table (1):** Distribution of the studied nurses according to their characteristics (n=70).

Socio-demographic data	No.	%
Age (years)		
20-<25	13	18.6
25-<30	27	38.6
30-<35	5	7.1
35-<40	3	4.3
≥40	22	31.4
$\bar{x} \pm SD$	34.77±5.91	
Gender		
Male	16	22.9
Female	54	77.1
Social Condition		
Unmarried	15	21.4
Married	46	65.7
Divorced	5	7.1
Widow	4	5.7
Qualification		
Diploma of nursing (3 years)	14	20.0
Diploma of technical nursing institute (2 years)	45	64.3
Bachelor of nursing science	6	8.6
Other (Interns, nursing students).	5	7.1
Experience (year)		
<1	2	2.9
1-<5	11	15.7
5-<10	19	27.1
10-<15	38	54.3
$\bar{x} \pm SD$	2.38±0.40	
Attending training courses		
Yes	29	41.4
No	41	58.6

Figure (1): Distribution of the studied nurses according to their age (n=70).

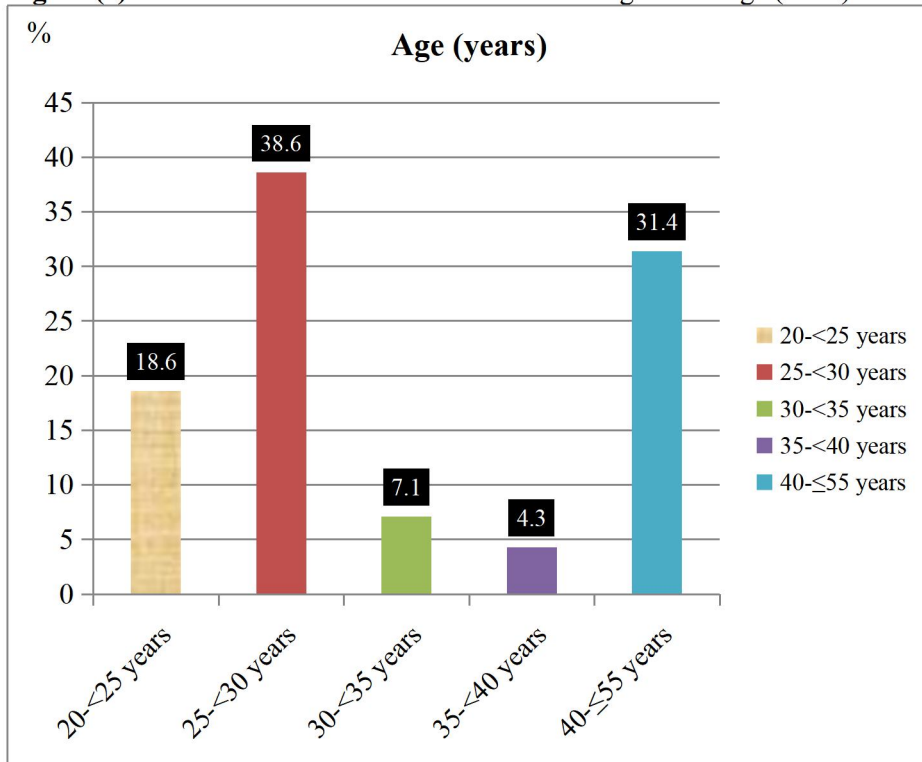


Figure (1) Shows that age of 38.6% of the studied sample ranged from 25-30 years while it shows that 4.3% of them ranged from 35-40.

Figure (2): Distribution of the studied nurses according to their gender (n=70).

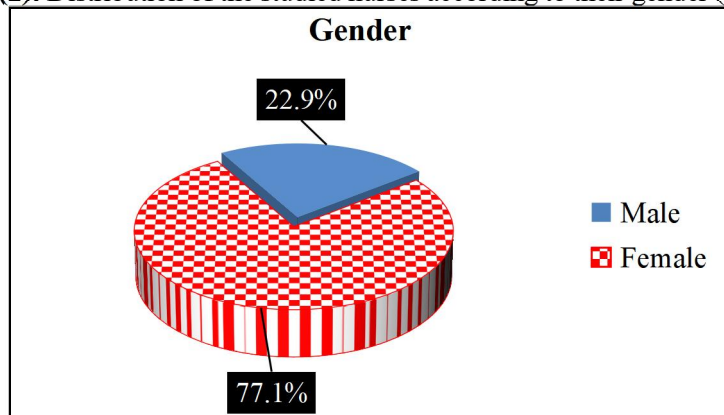


Figure (2) Shows that 77.1% of the studied sample were females. While 22.9% of them were male.

Table 1 shows that age of 38.6% of the studied sample ranged from 25-<30 years. Also 77.1% of the studied sample were females and 65.7% of them were married. Moreover, this table shows that 64.3% had diploma of technical nursing institute (2 years), regarding the years of experiences, 54.3% of the studied sample had from 10-<15 years of experiences and 58.6% of them attended training courses.

Table (2): Distribution of the studied nurses according to their total knowledge regarding care of newborns at NICUs (n=70).

Total Competent and Incompetent of Neonatal Nursing Knowledge	(n=70)	
	No.	%
Satisfactory <80%	37	52.9
Unsatisfactory >80%	33	47.1
Total	70	100.0

Using: Chi-square test

P-value >0.05 NS; *p-value <0.05 S; **p-value <0.001 HS

Table 2 This table showed that the satisfactory core are implemented for newborns estimated at around (47.1%) while unsatisfactory (52.9%) of studied sample knowledge regarding care of newborns.

Table (3): Distribution of the studied nurses according to their total practice regarding care of newborns (n=70).

Total Competent and Incompetent of Neonatal Nursing practices	(n=70)	
	No.	%
Incompetent <80%	26	37.1
Competent >80%	44	62.9
Total	70	100.0

Table 3 This table showed that the competent core are implemented for newborns estimated at around (62.9%) while incompetent (37.1%) of studied sample practice regarding care of newborns.

Table (4): Relation between nurses' total knowledge regarding care of newborns at NICUs and their characteristics (n=70).

Socio-demographic data	(n=70)				X^2	p-value
	Incompetent (n=37)		Competent (n=33)			
	No.	%	No.	%		
Age (years):					17.682	<0.001**
20-<25	7	18.9	6	18.2		
25-<30	21	56.8	6	18.2		
30-<35	3	8.1	2	6.1		
35-<40	2	5.4	1	3.0		
≥40	4	10.8	18	54.5		
Gender:					2.102	0.147
Male	11	29.7	5	15.2		
Female	26	70.3	28	84.8		
Social Condition:					.125	0.989
Unmarried	8	21.6	7	21.2		
Married	24	64.9	22	66.7		
Divorced	3	8.1	2	6.1		
Widow	2	5.4	2	6.1		
Qualification:					2.803	0.423
Diploma of nursing (3 years)	7	18.9	7	21.2		
Diploma of technical nursing institute (2 years)	25	67.6	20	60.6		
Bachelor of nursing	4	10.8	2	6.1		
Other (Interns, nursing students).	1	2.7	4	12.1		
Experience:					11.426	0.010*
<1	1	2.7	1	3.0		
1-<5	6	16.2	5	15.2		
5-<10	4	10.8	15	45.5		
10-<15	26	70.3	12	36.4		
Attending training courses					25.204	<0.001**
Yes	5	13.5	24	72.7		
No	32	86.5	9	27.3		

Table (4) shows that there was a statistically significant relation between total studied sample knowledge regarding care of newborns at NICUs and their age and attending training courses at level ($P= <0.001$). Also, there was a statistically significant relation between total nurses' knowledge regarding care of newborns at NICUs and their experience at level ($p= 0.010$). While there was a statistically insignificant relation between total nurses' knowledge and their gender at level ($p= .147$).

Table (5): Relation between nurses' total practices regarding care of newborns and their characteristics (n=70).

Socio-demographic data	(n=70)				X ²	p-value
	Incompetent (n=26)		Competent (n=44)			
	No.	%	No.	%		
Age (years):					8.856	0.065
20-<25	5	19.2	8	18.2		
25-<30	13	50.0	14	31.8		
30-<35	3	11.5	2	4.5		
35-<40	2	7.7	1	2.3		
≥40	3	11.5	19	43.2		
Gender:					3.243	0.072
Male	9	34.6	7	15.9		
Female	17	65.4	37	84.1		
Social Condition:					.395	0.941
Unmarried	5	19.2	10	22.7		
Married	17	65.4	29	65.9		
Divorced	2	7.7	3	6.8		
Widow	2	7.7	2	4.5		
Qualification:					2.135	0.545
Diploma of nursing (3 years)	7	26.9	7	15.9		
Diploma of technical nursing institute (2 years)	14	53.8	31	70.5		
Bachelor of nursing	3	11.5	3	6.8		
Other	2	7.7	3	6.8		
Experience:					4.409	0.221
<1	1	3.8	1	2.3		
1-<5	3	11.5	8	18.2		
5-<10	4	15.4	15	34.1		
10-<15	18	69.2	20	45.5		
Attending training courses					3.587	0.058
Yes	7	26.9	22	50.0		
No	19	73.1	22	50.0		

Table (5) shows that there was statistically insignificant relations between total nurses' practices and their characteristics.

Discussion:

The results of the current study revealed that 64.3% had diploma of technical nursing institute (2 years) and 58.6% of

them were attended training courses. These results were in contradiction with the study of *Rogowski et al. (2013)*, entitled "Nursing Staffing in Neonatal Intensive Care Units in United

States", which showed that most NICU nurses had a bachelor degree in nursing, and all of the registered nurses in the NICU had varying levels of training courses (specialty certification or advanced training and experience in the nursing management of high risk neonates and their families) and experience that may complement infants with more and less complex status. From the researcher point of view that most of NICU had diploma of technical nursing institute (2 years) was related to wrong distribution of nursing management to specialist nurses after graduation on hospitals.

Regarding the years of experience, the current study showed that 54.3% of the studied sample had from 10-<15 years of experiences. this could have been related to nurses' remaining without rotation sense their graduation .This was contradicted the findings of *Ibrahim & Khudhair's (2022)*, who mentioned in the study entitled "Effectiveness of an Instructional Program for Nurses' About Nursing Documentation at Pediatric Surgical Wards. Submitted for Partial Fulfillment of the Requirements of The Master Degree in Pediatric Department" who found that near half of nurses had years of experience from 6 -10 years.

The current study revealed that the competent core are implemented for newborns estimated at around (47.1%) while incompetent (52.9%) of studied sample knowledge regarding care

of newborns, this could have been related to the nurses' workload with neonates and nursing staff shortages. this results was accordance with *Rocheffort et al. (2016)*, in the study entitled "Rationing of nursing care interventions and its association with nurse-reported outcomes in the neonatal intensive care unit: a cross – sectional survey", where from a total of 285 NICU RNs, more than one third reported rationing discharge preparation for the neonates from the NICU competently, also they were able to provide infant comfort care in addition to being competent regarding providing the infant's relatives with the essential information for the care and follow up of their neonate after discharge.

The current study revealed that the competent core are implemented for newborns estimated at around (62.9%) while incompetent (37.1%) of studied sample practice regarding care of newborns this could have been related to the nurses' misunderstanding indication of different ways of measuring newborns temperature. This result is contradiction with *Hasegawa et al. (2014)*, who mentioned in the study entitled "Extending role by Japanese neonatal nurses after training for performing vital signs monitoring" that all neonatal nurses had competent skills as regards to rectal temperature measuring, more than one third of them had opportunity to perform apical pulse.

Regarding nutrition The current study revealed that the

competent core are implemented for newborns estimated at around (62.9%) while incompetent (37.1%) of studied sample practice regarding care of newborns. This result was in accordance with *Touzet et al. (2016)*, who mentioned in the study entitled "Effective of nurse educational oral feeding programe on feeding outcomes in neonates: protocol for an interrupted time series design", that feeding procedures were more effective when delivered by knowledgeable and skilled nurses. From the researcher point of view that a training program to NICU nurses considered necessary.

Regarding medication administration, The current study revealed that that the competent core are implemented for newborns estimated at around (62.9%) while incompetent (37.1%) of studied sample practice regarding care of newborns. These results were in contradiction with those of *Shahrokhi et al. (2013)*, who mentioned in the study entitled "Factors effective medication errors: A neonatal nursing view" that most of the NICU nurses were competent regarding IV therapy administration as well as blood and blood products' administration for neonates. In the current research, the top contributing among nurse-related factors was the careless performance of the neonatal nurse which was mentioned as one of the most effective factor by other researchers too.

The current study revealed that that the competent core are implemented for newborns estimated at around (62.9%) while incompetent (37.1%) of studied

sample practice regarding care of newborns this could have been related to the nurses' workload with neonates and nursing staff shortages. This result was in accordance with *Reda et al. (2019)*, who mentioned in the study entitled "Assessment of Nurses' Knowledge and Practices Related Neonatal Sepsis in Neonatal Intensive Care Units at El-Minia Hospitasl" the majority of nurses in the neonatal units at Der-Mwas hospital and Malloway hospital had satisfactory knowledge and good practices related to neonatal sepsis in the neonatal intensive care units while the minority of them had unsatisfactory knowledge and average practices.

The current study showed that the competent core are implemented for newborns estimated at around (47.1%) while incompetent (52.9%) of studied sample knowledge regarding care of newborns and that the competent core are implemented for newborns estimated at around (62.9%) while incompetent (37.1%) of studied sample practice regarding care of newborns this could have been related to the nurses' qualifications with neonates and nursing staff shortages. This result is in accordance with *Mirlashari et al. (2016)*, who mentioned in the study entitled "Clinical competence and its Related Factors of Nurses in Neonatal Intensive Care Units "that more than two thirds from the total neonatal nurses are competent regarding their nursing activities and the remaining nurses needs

more training to improve their performance. The study concluded that more than half of studied nurses were having incompetent nursing care activities at NICU.

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