

## Assessment of Nurses' Knowledge and Practice Regarding to Kangaroo Care at Neonatal Intensive Care Unit (NICU)

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### Abstract

**A descriptive study** was carried out, aiming to assess knowledge and practices of neonatal nurses regarding kangaroo care. **Setting** at the neonatal intensive care units of children's hospital, affiliated to Ain Shams University hospitals. **The total sample** were 50 nurses who worked in neonatal intensive care units. **Tools of the study** involved; interview questionnaire sheet, to assess characteristics of the nurses and their knowledge about kangaroo mother care, and an observation checklist adopted from **World Health Organization, (2013)** to assess nurses' practices regarding maternal kangaroo care. **The main results** showed that more than half of the nurses had satisfactory total knowledge levels regarding prematurity and kangaroo care, and slightly less than half of them had satisfactory total practice levels of regarding kangaroo care. There were statistically significant differences between nurse's knowledge of kangaroo and their age, educational level, years of experience in NICU and previous training courses in kangaroo care. **The study concluded** that nurses' knowledge and practice regarding premature baby and kangaroo care were satisfactory by nearly half of the studied sample. **The study recommended** that kangaroo care technique should be a part of the routine care for all premature and lowbirth weight newborn infants admitted to NICU.

**Key words:** prematurity, kangaroo care, Nurses knowledge, Nurses Practice.

### Introduction

In the past, premature birth was the major cause of infant mortality. Today, the quality of neonatal care has greatly improved and high percent of infants born as early as 28 weeks now survive. However, preterm birth is still the top cause of infant deaths worldwide, according to a 2010 study which is published in the British medical journal lancet. Birth is considered premature or preterm when it occurs before 37 weeks of gestation. Normally full term gestation is 37 to 42 weeks. Premature infant weight much less than infants born full term. They also have serious health problems that require a long stay in the hospital. They are cared for

by specially trained physicians and nurses in a neonatal intensive care unit (NICU) (*Blencowe et al., 2012*).

In the 1970s, Columbian Pediatrician Edgar Rey was looking for a way to keep premature infants warm in an area that was too poor to provide incubators for its preemies. He had mothers of preemies hold their infants continuously, wearing only a diaper, upright between their breasts. Not only did the infants stay warm, but they seemed to leave the hospital earlier and with better breast feeding rates (*Flacking et al., 2011*).

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Kangaroo care has become much more than a way to keep infants warm in undeveloped nations, it's common in modern NICUs and studies have proven that it has a number of benefits for mothers and for infants. Kangaroo care is a way of holding infants skin to skin with a mother. In kangaroo care, an infant is undressed down to the diaper and placed on a mother's bare chest. A blanket is placed over the infant for warmth (*Cong et al., 2011*).

Kangaroo care has been shown to have several benefits for premature infants and their mothers. It helps infants breath and sleep better, gain weight more a quickly and have more stable temperature. Mothers who practice kangaroo care have better milk supplies and less depression and mothers who practiced continuous kangaroo mother care (KMC) (24h/day) have reported that they liked having this close contact with their infant and that they felt safe with this care (*Conde-Agudelo et al., 2011*).

It has been recommended that staff initiate continuous kangaroo mother care (KMC), as soon as possible after the infant is born and after initial resuscitation and stabilization (*Nyqvist et al., 2010*).

NICU nurses' attitudes in skin to skin contact (SSC) practice are ambivalent. The nurses consider the sensory, wellness, and mutuality experiences to be primary and vital and enact SSC as much as possible. But "as much as possible" is a broad and varied concept, and their attitudes are ambivalent in terms of not always facilitating what they consider to be the optimal caring conditions. The source of NICU nurse's ambivalent attitudes in SSC practice is a complex interplay of beliefs, norms, and evidence, which have a multidisciplinary basis (*Cong et al., 2011*).

### **Significance of the Study:**

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It's important to carry out this study to shed light on nurses' knowledge and skills

regarding maternal kangaroo care (MKC) that consequently can help in better quality of care and overcoming the possible barriers hindering MKC for neonates at neonatal intensive care unit (NICU).

### **Aims of the study:**

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The aim of the study is to assess knowledge and practice of neonatal nurses regarding kangaroo care through the followings:

1. Assessing nurses' level of knowledge regarding kangaroo care for premature baby.
2. Assessing nurses' level of practice regarding kangaroo care for premature baby.

### **Research questions:**

1- What is the level of nurses' knowledge and practices regarding to kangaroo mother care?

2- Is there a relation between characteristics of the nurses at neonatal intensive care unit and their knowledge and practice regarding to kangaroo care?

### **Subject and Methods:**

#### **Research Design:**

Descriptive design.

#### **Setting:**

This study was conducted in the unit of neonatal intensive care unit of Children's Hospital, affiliated to Ain Shams University.

#### **Subject:**

The study sample consisted of a convenient sample of nurses working in the previously-mentioned setting. The total

number of nurses was (50; 15 males + 35 females), regardless their age, gender, marital status, qualifications, level of education, years of experience or attendance of educational courses relevant to KMC.

#### **Tools for data collection:**

##### **A pre-designed nurse's questionnaire:**

It was designed to assess nurses' socio-demographic characteristics and their knowledge regarding premature infants and kangaroo care, it included the following parts:

**Part 1:** It is consisted of (6) questions concerned with the socio-demographic characteristics of the nurses such as age, qualifications, years of experience and attendance of previous training courses relevant to KMC.

**Part 2:** It is consisted of (6) questions related to premature infants to measure nurses' knowledge regarding: the normal weight of infants at birth, in addition to the definition, causes, complications and methods of prevention of prematurity in infants.

**Parts 3-7:** It consisted of (35) questions related to kangaroo care for premature infants, like: previous training about kangaroo care, in addition to nurses' knowledge regarding definition, position, benefits, and obstacles of kangaroo care.

In addition, it included questions concerned with: the nurses' application of kangaroo care, their knowledge about where and who can apply it, the type of premature infants in need to receive kangaroo care, its benefits for the premature newborn infants and mothers, the nurses' knowledge about kangaroo care and the nursing role regarding kangaroo care.

**The scoring system** for the studied nurses' knowledge was designed as follows: A score was assigned for each question concerning specific items. According to the nurses' answers, the scores were summed up and converted into percentages.

The total score was (47) marks. Each correct answer was given (one) mark and the incomplete correct answer was given (zero). A knowledge score  $\geq 60\%$  was considered satisfactory, while  $< 60\%$  was considered unsatisfactory.

##### **Tool II: Observational checklist (Appendix III):**

The observational checklist was adopted from the **WHO (2013)**, to assess nurses' actual practice regarding kangaroo care in premature infants. Each nurse was observed and evaluated by the researcher using the observational checklist. The time consumed to observe the studied nurses ranged from 20-30 minutes for each one.

##### **❖ scoring system**

for the practice of the studied nurses regarding KMC was designed as follows: it contained 8 steps, each step scored (1) if done correctly and (0) if not done. A total score level  $< 60\%$  was regarded as unsatisfactory; while a score  $\geq 60\%$  was regarded as satisfactory.

##### **Observational checklist:**

The observational checklist was adopted from the **WHO (2013)**, to assess nurses' actual practice regarding kangaroo care in premature infants.

##### **Pilot study:**

Before performing the actual study, a pilot study was carried out, which included (10%) nurses in the previously-mentioned setting to test the clarity and applicability of

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the study tools and the time needed to fill each one. The nurses involved in the pilot study were included in the main study sample.

### Field work:

The researcher started by introducing herself to the studied nurses and giving them a brief idea about the aim of the study. The researcher was available two days/week during morning and afternoon shifts. The predesigned questionnaire sheet was filled by each nurse. The time consumed to answer the questionnaire sheet ranged from 20-30 minutes for each nurse. Each nurse was observed and evaluated by the researcher using the observational checklist. The time consumed to observe the studied nurses ranged from 20-30 minutes for each one.

### Ethical considerations:

The research approval was obtained from the ethical research committee at the Faculty of Nursing, Ain Shams University before conducting the study. The researcher

clarified the aim and procedures of the study to each study subject before starting the actual field work. The researcher assured maintaining the anonymity and confidentiality of the subjects' data. The studied nurses were informed that they were allowed to choose to participate or not in the study and they had the right to withdraw from the study at any time.

### Statistical design:

Data were revised, coded, tabulated and analyzed using number and percentage distribution using SPSS (Statistical Package for Social Sciences) software. Proper statistical tests were used to determine whether there was a significant statistical difference or not.

### Significance of results:

- At  $P < 0.05$ , there was a statistically significant difference.
- At  $P > 0.05$ , there was no statistically significant difference.

### Result

**Table (1):** Distribution of the studied nurses according to their socio-demographic characteristics (n=50).

Items	No.	%
<b>Age:</b>		
< 20	3	6.0
20<25	20	40.0
25<30	13	26.0
30<35	9	18.0
35≤40	5	10.0
Mean±SD	26.57±5.31	
<b>Gender:</b>		
Male	15	30.0
Female	35	70.0
<b>Educational level:</b>		
Master degree	9	18.0
Bachelor degree	11	22.0
Technical nursing diploma	18	36.0
Technical nursing diploma and specialty	12	24.0

**Table (1):** shows that, age of 40 % of the studied nurses were ranged from 20< 25 years. In relation to their gender it was found that 70% of them were females, regarding to their educational level, it was found that 36% of them had technical nursing diploma while 22% of them had bachelor degree.

**Table (2):** Distribution of the studied nurses according to their years of experience in NICU and previous training in kangaroo care (n=50).

Items	No.	%
<b>Years of experience in NICU:</b>		
< 1	9	18.0
1<5	24	<b>48.0</b>
5<10	14	28.0
10<15	2	4.0
15≤20	1	2.0
Mean±SD	6.04±2.88	
<b>Previous training in kangaroo care:</b>		
Yes	6	<b>12.0</b>
No	44	88.0

**Table (2):** Concerning years of experience, this table shows that, about half of studied nurses (48%) reported 1<5 years of experience in neonatal intensive care units, and only 12% of them had previous training in kangaroo care.

**Table (3):** Distribution of the studied nurses regarding their total knowledge about premature infants and kangaroo care (n=50).

Total knowledge	No.	%
Satisfactory	27	<b>54</b>
Unsatisfactory	23	46

**Table (3):** showed that 54% of the studied nurses had satisfactory levels of total knowledge regarding premature infants and kangaroo care.

**Table (4):** Distribution of the studied nurses regarding their total practice of kangaroo care (n=50).

Total practice	No.	%
Satisfactorily done	21	<b>42</b>
Unsatisfactorily done	29	58

**Table (4):** showed that 42% of the studied nurses had satisfactory levels of practice regarding kangaroo care for premature infants.

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**Table (5):** Relation between the characteristics of the studied nurses and their total knowledge regarding premature infants (n=50).

Characteristic data	Total Knowledge				Chi-square test	
	Satisfactory (N=27)		Unsatisfactory (N=23)		X <sup>2</sup>	P-value
	No.	%	No.	%		
<b>Years of experience in NICU:</b>						
< 1	1	3.7	8	34.8	13.353	0.009
1<5	12	44.4	12	52.2		
5<10	12	44.4	2	8.7		
10<15	1	3.7	1	4.3		
15≤20	1	3.7	0	0.0		

**Table (5):** showed the relation between total nurses' knowledge and their years of experience. It is clear that there were statistically significant differences between nurses' total knowledge regarding premature infants and kangaroo care and their years of experience in NICU where  $\chi^2 = 13.353$  with P-value = 0.009.

**Table (6):** Relation between studied nurses' characteristics and their total practice in kangaroo care (n=50).

Characteristic data	Total practice				Chi-square test	
	Done (N=21)		Not done (N=29)		X <sup>2</sup>	P-value
	No.	%	No.	%		
<b>Qualifications:</b>						
Master degree.	9	42.9	0	0.0	19.191	<0.001
Bachelor degree.	6	28.6	5	17.2		
Technical nursing diploma.	4	19.0	14	48.3		
Technical nursing diploma and specialty.	2	9.5	10	34.5		
<b>Years of experience in NICU:</b>						
< 1	0	0.0	9	31.0	29.399	<0.001
1<5	5	23.8	19	65.5		
5<10	13	61.9	1	3.4		
10<15	2	9.5	0	0.0		
15≤20	1	4.8	0	0.0		
<b>Previous training in kangaroo care:</b>						
Yes.	6	28.6	0	0.0	6.904	0.009
No.	15	71.4	29	100.0		

**Table (6):** showed the relation between nurses' characteristics and their total practice. It is clear that there were statistically significant differences between nurses' total practice regarding kangaroo care and their qualification, years of experience in NICU, and previous trainings in kangaroo care where  $\chi^2 = (19.191, 29.399 \text{ and } 6.904, \text{ with P-value} = < 0.001, < 0.001, 0.009)$ .

## Discussion:

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Globally in (2012), there were 15 million infants born prematurely. The majority of premature infants occur in resource-poor countries including India, Nigeria, Pakistan, and the Democratic Republic of Congo, where many die due to the lack of basic skilled nursing care.

The aim of the current study was to assess neonatal nurses' knowledge and practice regarding maternal kangaroo care (MKC) that consequently can help in providing better quality of care and overcoming the possible barriers hindering MKC for neonates at the neonatal intensive care units (NICUs). The study was carried out at the NICUs of the children's hospital, affiliated to Ain Shams university hospitals.

In the present study, the socio-demographic characteristics of the studied nurses revealed that less than half of them were aged less than 25 years old. This result agreed with that of a study done by **Farouk (2009)**, about the assessment of nursing care given for high risk neonates, and reported that the nurses dealing with high risk neonates aged between  $20 < 25$  years.

Regarding the gender of the studied nurses, the results of the present study showed that about two thirds of them were females. This finding was similar to the results of **Farouk (2009)**, who found that more than two thirds of the studied nurses were females. This may assure the idea that the female nurses preferred working in NICUs more than male nurses.

Regarding the nurses' qualifications, it was found that more than one third of them had nursing diplomas. This result agreed with that of a study carried out by **Abo Zaid (2008)**, about the quality of nursing care to high risk neonates receiving total parenteral nutrition, which described that more than half of the studied nurses had nursing diplomas. This may be due to the fact that nursing

secondary schools provide the community with large number of nursing graduates than other agencies such as faculties and technical institutes of nursing.

Regarding the years of experience of the studied nurses, the present study showed that near half of them had  $1 > 5$  years of experiences in NICUs with mean years of experiences of  $6.04 \pm 2.88$  years. This finding was similar to the findings of **Kunswa (2010)**, in the study "Needs, problems and nursing care of newborn infant", who found that the majority of the studied nurses had years of experience from 5-10 years with a mean of  $5.5 \pm 3.01$  years.

According to the National Association of Neonatal Nurses **NANN (2012)**, the years of experience in the NICU had a significant effect on the nurses' knowledge and performance, which resulted in improving the quality and consistency of care provided to the high-risk neonates.

The current study's results also showed that the majority of the studied nurses did not attend any training courses related to kangaroo care. These findings were supported by **Mustafa (2007)** who found that, the majority of the nurses did not attend training courses in NICU, and this might affect their levels of knowledge and performance. Also, these results were similar to those in the study done by **Flynn and Leahy-Warren (2010)**, "Neonatal nurses' knowledge and beliefs regarding kangaroo care with preterm infants" that included 75 neonatal nurses who implemented kangaroo care in their practical work and had a positive belief about the method, it was showed that none of these nurses received any formal training or education in kangaroo care.

According to the study of **Carol (2009)**, "Nurses, attendance of training courses for caring of neonates in NSICU", the training programs play an important role in enhancing and updating the nurses' knowledge and practice, in addition to improving the quality

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of care given to the neonate. The researcher believes that attending training programs by nurses, especially in the NICU and especially in kangaroo care, is crucial to provide proper quality of nursing care for newborns.

Regarding assessing nurse's knowledge about prematurity, it was found that about two thirds of them had satisfactory knowledge about premature newborn infants. This result was inconsistent with the study of **Abdel-Hamid (2007)**, "Effect of the quality of nursing care on the preterm neonate's in incubator" which stated that more than half of the nurses had poor knowledge about premature infants.

**Beal (2000)**, recommended that the nurses who assume responsibility for premature infants should receive an advanced neonatal orientation program before starting work in NICUs.

In the present study, less than half of the studied nurses had proper knowledge regarding the definition and correct position of kangaroo care. This result was similar to that of **Arohi et al. (2013)**, "Knowledge and attitude regarding KMC practice among healthcare providers", which illustrated that about one third of the studied nurses had proper knowledge regarding the definition and position of KMC.

Regarding the nurses' knowledge about the benefits of kangaroo care for premature infants, the findings of the current study showed that the nurses believed that KMC increased the premature infant's body weight. This finding was similar to those in the study conducted by **George (2013)**, who found that more than half of the studied subjects agreed that KMC helped to increase infant's body weight. Also, in the study of **Flacking et al. (2011b)**, "The benefits of kangaroo care", it was stated that infants on KMC had better weight gain and, therefore were discharged early.

In the present study, the results revealed that less than half of the studied nurses believed that kangaroo care decreased pain sensation in infants. This result was inconsistent with the study done by **McCord (2011)**, "Exploring nurses' perceptions on the use of KMC to reduce pain", which found that the nurses appeared to be empathetic to the fact that infants in the NICU experienced pain and believed that KMC can reduce the pain-related procedures.

Regarding the nurses' knowledge about the benefits of kangaroo care for the mother, the findings of the current study showed that the minority believed that KMC increased breastfeeding. This result was inconsistent with a study conducted by **Singh and Yadav (2012)**, who found that the majority of the studied sample believed that KMC led to more effective breastfeeding. According to **Hung and Berg (2014)**, kangaroo care is a beneficial method for breast-feeding and temperature control of all newborn infants.

In the present study, near a quarter of the studied nurses believed that KMC increased bonding between mother and infant. This result was inconsistent with the study conducted by **Singh and Yadav (2012)**, who stated that kangaroo care increased togetherness, improved the threat of separation, provided a sense of containment and closeness; in addition, mothers were more quickly adapted to the appearance of their infants, and it strengthened the mother's confidence in gaining emotional control.

According to **Flacking et al. (2014)**, kangaroo care facilitated bonding, enhanced the warm and loving sensation that comes with bonding and made the mother feel the affectionate relationship sooner with her infant. In a similar study, **Wallace and Marchall (2001)** found that skin to skin contact between the mother and newborn infant promoted maternal-neonate attachment.

It was found by **Charpak et al. (2010)**, that mothers in a kangaroo care group scored more favorably on the sense of competence, feelings of worry or stress, sensitivity, and infant's responsiveness. Moreover, the total attachment scores determined through structured interviews by **Gathwala et al. (2012)** were higher in the kangaroo care group than in controls.

Regarding the nurses' knowledge related to the obstacles of kangaroo care, the results clarified that near half of them reported that the place in NICU was not suitable for applying kangaroo care. This result was similar to that in the study done by **Olsson et al. (2012)**, about NICU nurses' ambivalent attitudes in skin-to-skin care practice, which illustrated that the staff members working in NICUs considered the lack of space in the intensive care room an important barrier in applying kangaroo care.

Also, these results were similar to those in the study conducted by **McCord (2011)**, who found that more than half of the nurses identified an array of context-related issues in the NICUs that included increased workload, inadequate physical space, poor lighting and lack of privacy.

From the researchers' point of view, sometimes the shortage in supplies and facilities leads to inadequacy in nursing care in this aspect.

Regarding the nurses' knowledge about the nursing role in kangaroo care, the current study illustrated that the majority had good levels of knowledge. This result was similar to that in the study done by **Chia et al. (2006)**, about the attitudes and practices of neonatal nurses in the use of kangaroo care, where the majority of the nurses had good levels of knowledge and positive attitudes towards the nursing role in kangaroo care.

The researcher believes that the nurse's knowledge regarding kangaroo care should

be raised and updated to encourage mother's practice of such technique.

This view was supported by the study of **Chan et al. (2016)**, "Investigating the factors influencing the adoption of KMC in different contexts" and another study by **Ramaiah (2016)**, that was conducted at Umm-Al Qura University, and found that nurses had inadequate knowledge regarding KMC. According to the study of **El Zaidy et al. (2017)**, "Effect of family centered developmental care program on nurses working at NICUs" the nurses' knowledge regarding MKC can improved significantly with educational programs and guidelines.

On assessing nurse's practice regarding kangaroo care, the current study clarified that less than half of them had satisfactory levels of practice regarding kangaroo care. This result was in disagreement with the study done by **George (2013)**, who found that the majority of the studied subjects had good scores related to the practice of kangaroo care technique.

Furthermore, the results in the current study found that there were statistically significant differences between the total knowledge of the studied nurses and their age, educational level, years of experience in NICU and previous training in kangaroo care with P-value ( $< 0.05$ ).

In a similar study done by **Arohi et al. (2013)**, "Knowledge and attitude regarding KMC practice among healthcare providers in India", there was a statistically significant association between the knowledge related to KMC and HCPs training ( $P < 0.0001$ ), while the association between their total scores and education or experience was statistically insignificant.

There was also a statistically insignificant association between knowledge scores and education. This shows that even if the neonatal nurses were less educated, their skills can be enhanced by imparting training.

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### Conclusion

Based on the findings and research questions of the present study, it can be concluded that most of the nurses had average knowledge regarding kangaroo care and less than half of them had satisfactory practices regarding kangaroo care.

### Recommendations:

Kangaroo care technique should be a part of the routine care for all premature and low birth weight newborn infants admitted to NICUs.

An illustrated leaflet demonstrating step by step kangaroo care technique should be available at neonatal intensive care units.

Preparing a well-equipped room with warming and comforting needs for premature neonates and their mothers in NICUs for a better practice of kangaroo care.

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