

Nurses' Knowledge, Perception and Practices Regarding Kangaroo Care for Preterm Infants

Nehal shehta arabie*, Dr. Azza Abdesemie**, Dr. Asmaa Awad***

Clinical Instructor at Faculty of Nursing Badr University*,

Assistant Professor and Head of Pediatric Nursing department**,

Lecturer of Pediatric Nursing Faculty of Nursig Helwan University***

Abstract: Back ground: Preterm is an infant born before 37 weeks of gestational age there are sub-categories of a preterm infant, based on gestational age. Kangaroo care is evidence-based approach intervention package reducing morbidity and mortality of preterm infants. Aim of this study was to assess neonatal nurses' knowledge, perception and practices regarding kangaroo care for preterm infants. Design: A descriptive design was used. Setting: The study was conducted at 15 Mayo and Om El Masreen General Hospitals. Subjects: A Purposive sample includes 60 nurses from the previous mentioned setting. Tools: Data were collected through using three tools; a structured questionnaire sheet to assess nurses' knowledge, an observational check list to assess nurses' practices and nurses' perception likert scale to assess nurses' perception. Results: The study revealed that less than half of studied nurses had average knowledge, three fifth had negative perception, and two third were unsatisfied practice. Conclusion: The study concluded there were highly significant positive correlation between total knowledge, practices and total perception regarding kangaroo care. Recommendations: Develop an educational program to meet the actual need of nurses in neonatal intensive care units about the kangaroo care. Provide neonatal nurses an instruction booklet about kangaroo care.

Keywords: Nurses, Knowledge, Practice, Perception, Kangaroo Care, Preterm Infants.

1. INTRODUCTION

Preterm infants are live born infants delivered before 37 weeks, from the first day of the last menstrual period. It accounts for the largest number of admissions to the neonatal intensive care unit (NICU). Preterm infants can develop a range of problems because their organs are not mature enough (6).

Each year 15 million infants are born preterm infants and their survival chances vary dramatically around the world. Prematurity is a major direct cause of an estimated 28% of neonatal deaths. Low birth weight (LBW), caused by either prematurity or intrauterine growth restriction, directly or indirectly contributes to 60 % to 80% of neonatal mortality (8).

Kangaroo Care (KC), which is often also called kangaroo mother care (KMC) or skin to skin contact (SSC), is a method of neonatal care practiced on preterm infants. This is typically performed with preterm infants, where the diaper clad infant is held skin to skin with a parent. Kangaroo care is an established, powerful and easy method used for promoting the health and well-being of preterm infants and full-term infants (23).

Kangaroo care was first introduced in 1978 by Edgar Rey as alternative neonatal care to incubators for LBW in Bogotá, Colombia. Mothers are considered as natural incubators to preserve infants' body temperature as well as other vital signs through continuous SSC, which represents the first and the major domain of KC (27).

Clinically stable infants are kept between the mother's breasts below clothes and are placed at the chest. The second domain is the exclusive or nearly exclusive breastfeeding, where the infant benefits from their mother's milk as the main source of food during mother's care (7).

Kangaroo care promote greater effective bond and thermal stability, also contribute to reduce stress and pain in the preterm infants, increase breast feeding rates, improve neurobehavioral and psycho-affective development, providing a better family health team relationship, decreasing the number of readmissions and contributing to the optimization of NICU (27).

The neonatal nurse's role is one of the astute clinician, educator and trainer for KC, caretaker of the infant, supporter of the parents, visionary leader, good team player, problem solver and wise manager, as well as being the provider of emotional support and guidance (19).

Neonatal nurses today are challenged not only to provide the best possible developmental care for a preterm infant but also to help the mother through an uncertain mother hood toward a feeling of being a real mother for preterm infants (1).

Neonatal nurses play important role in neonatal care, can help mothers develop mutual interaction with preterm infant through application of KC and encourage mothers to provide care for preterm infant (27).

Significance of the study

Nearly 2.7 million preterm infants around the world die every year. Approximately 20 million preterm infants with a LBW less than 2.5 kg are considered preterm infants. These preterm infants have an increased risk of some disease, developmental delay, early physical growth retardation, and infant death. Preterm infants care imposes a high burden to public health systems because many of these preterm infants require hospitalization (1).

Preterm infants affected 1 of every 10 infants born in the United States. In Egypt, despite increase efforts to prevent preterm infant, the prevalence of preterm infants has significant rate, it may reach approximately to 41,728 each year. These statistics may indicate in some way the highly rate of NICU admission every year, 52.9% were admitted to NICU every year (28).

Therefore, this study was carried out to assess nurses' knowledge, perception and practices regarding KC for preterm infants.

Aim of the Study

The aim of this study was to assess neonatal nurses' knowledge, perception and practices regarding kangaroo care for preterm infants.

Research question

What are the nurses' knowledge, perception and practices regarding KC?

Is there a relationship between nurses' knowledge, perception and practices regarding KC and their characteristics?

2. TOOLS OF DATA COLLECTION

Data were collected by using the following tools:

1st tool

An Interviewing Questionnaire (Appendix II)

It was designed by the researcher after reviewing related literature to collect the required data. It was written in simple Arabic language and it consists of three parts:

Part I

Characteristics of studied nurses such as age, gender, educational level, number of nurses in each hospital, years of experience and previous attending training programs regarding KC.

Part II

Characteristics of preterm infants as gender, gestational age, medical diagnosis, birth weight and birth order.

Part III**Nurses' Knowledge regarding Kangaroo Care**

Nurses' knowledge regarding **KC** and benefits of **KC**; it was adapted from (Engler, 2018) and modified by researcher; it consisted of 20 open and closed question to assess nurses' knowledge regarding **KC** for preterm infants. It included item as meaning of **KC**, duration of **KC**, benefits of **KC**, physiological and emotional outcome of **KC**, role of mothers during **KC**, role of nurse during **KC**, aim of **KC**, contraindication of **KC** and problem of **KC**.

Scoring System

Knowledge obtained from the studied nurses was checked with model key answer, the open questions scored as the following: correct answer takes "two" while the incomplete correct answer takes "one" and incorrect answer take "zero". For closed question a score "one" was given for every correct answer and score "zero" was given for every incorrect (wrong) answer. The total scores of knowledge were summed and converted into a percentage score.

Good knowledge if total score $\geq 85\%$ with score ≥ 34

Average knowledge if total score from $75 - < 85\%$ with score ranged from $(30 < 34)$.

Poor knowledge if total score from $< 75\%$ with score $(1 < 30)$.

2nd tool**Nurses perception likert scale regarding to kangaroo care (Appendix II)**

It was adopted from (Engler, 2018) to assess studied nurse's perception regarding **KC**, it consists of 20 statement for example; Kangaroo care is not feasible with preterm infant, Kangaroo care should be offered to all preterm infant in the **NICU** and Kangaroo care will help parents feel more confident in caring for preterm infants.

Scoring System

The total score of was ranged from 20 - 60 degree each statement was assigned a score according to nurses' responses were "one" disagree, "two" relatively agree and "three" agree. These scores were summed up and converted into a percentage.

The positive perception (≥ 60) with score ranged from $(48 \leq 60)$ and the negative perception (< 60) with score ranged from $(1 < 48)$.

3rd tool**An observational Checklist (Appendix II)**

This tool was adopted from (UNICEF, 2019) to assess nurse's practices regarding **KC**, it consists of 12 statements as preparation of area to practice **KC**, preparation of parent to practice **KC**, and position of preterm infant.

Scoring System

The total score of studied nurses' practices ranged from 0 - 24 degree each item was evaluated as "done" was taken "one" degree and "not done" was taken "zero" degree. These scores were summed and converted into a percentage score.

The competent practice ($\geq 80\%$) with score ranged from $(19-24)$ and the incompetent practice ($< 80\%$) with score ranged from $(1 < 19)$.

Content Validity

It was ascertained by three of experts in pediatric nursing. Their opinions elicited regarding the format, layout, consistency, accuracy and relevancy of the tools.

Reliability

Reliability analysis by measuring of internal consistency of the tool through Cronbach's Alpha test.

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Items	Cronbach alpha
An Interviewing questionnaire	0.753
Nurses perception scale	0.812
Observational checklist	0.851

III. Administrative Design

An official permission was obtained by submission of a formal letter issued from the Dean of Faculty of Nursing, Helwan University to the director of each of the previously mentioned setting from the Directorate of Om El-Masreen General Hospital and 15 Mayo Hospitals. Collect the necessary data for current study after a brief explanation of the purpose of the study and its expected outcomes, using proper channels of communication from authorized personnel.

Ethical Considerations

The research approval was obtained from the Ethical Committee of the Faculty of Nursing Helwan University. The researcher was clarified the objectives and aim of the study to nurses included in the study before starting. Oral consent was obtained from the studied nurses before inclusion in the study; a clear and simple explanation was given to the studied nurses. Secured that all the gathered data was confidential and used for research purpose only. The researcher was assuring maintaining anonymity and confidentiality of subjects' data included in the study. The studied nurses were informed that they have the right to withdrawal from the study at any time.

3. RESULTS
Part I: Characteristics of the Studied Nurses.
Table (1) Distribution of the Studied Nurses According to their Characteristics (N= 60).

Item	N	%
Age in years		
20 < 25	20	33.3
25 < 30	15	25
30 < 35	10	16.7
35 ≤ 40	15	25
Mean ± S.D = 29.5 ± 6.23		
Gender		
Male	14	23.3
Female	46	76.7
Educational level		
Diploma of nursing	15	25
Technical institute of nursing	30	50
Bachelor degree	10	16.7
Post graduate	5	8.3
Number of nursing in each hospital		
Om El-masreen general Hospital	31	51.7
15 Mayo General Hospital	29	48.3
Years of experience		
1 < 5 years	20	33.3
5 < 10 years	15	25
10 < 15 years	10	16.7
≥ 15	15	25
Mean ± S.D = 9.45 ± 2.10		
Previous attending training program regarding kangaroo care		
Yes	12	20
No	48	80

Part II: Characteristics of Preterm Infants.

Table (2) Distribution of Preterm Infants According to their Characteristics (N=120)

Characteristics of studied preterm infants	N	%
Gender		
Male	44	36.7
Female	76	63.3
Gestational Age /weeks		
30 < 32	30	25
32 < 34	28	23.3
34 ≤ 36	62	51.7
Mean ± S.D =32.45 ± 4.06		
Medical Diagnosis		
Neonatal jaundice	56	46.7
Respiratory distress	30	25
Low birth weight	34	28.3
Birth weight		
<1000 gm.	40	33.3
1000 gm to less than 1500 gm.	36	30
1500 to less than 2500gm.	24	20
≥ 2500 gm.	20	16.7
Mean ± S.D =1441.66 ± 125.4 gm.		
Birth order		
First	54	45
Second	34	28.3
Third	20	16.7
Fourth	12	10

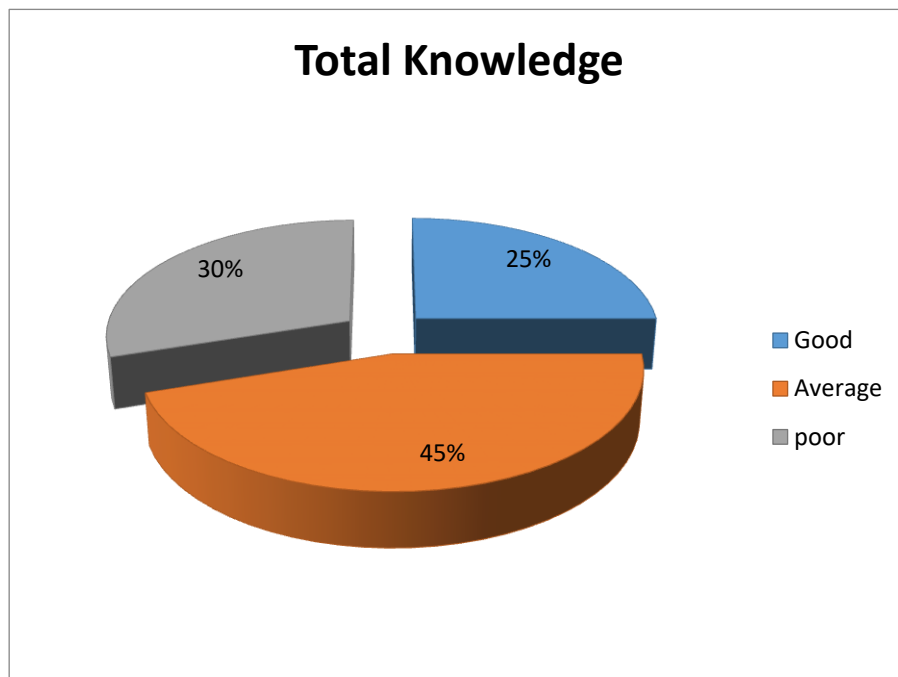


Figure (1) Total Knowledge of Studied Nurses Regarding kangaroo care (N= 60)

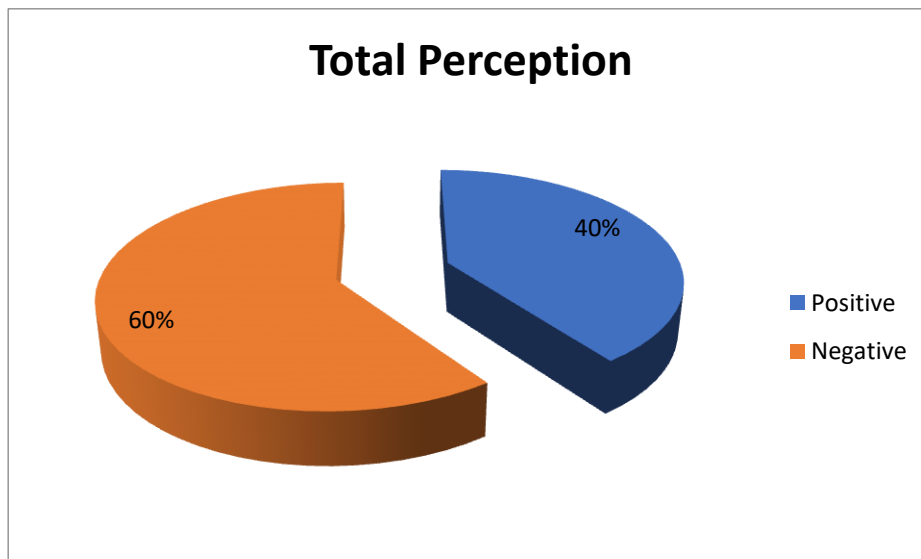


Figure (2) Total Perception of Studied Nurse Regarding Kangaroo Care (N= 60).

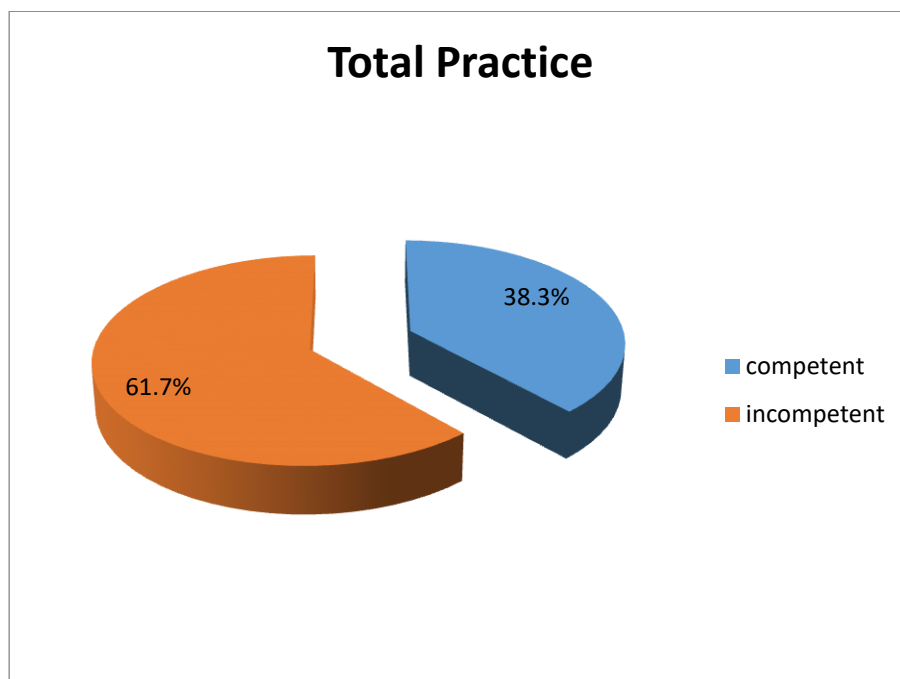


Figure (3): Total practice of studied nurses regarding kangaroo care (N= 60).

4. DISCUSSION

Part (I): Characteristics of the Studied Nurses

Concerning age, the finding of the present study (table1) revealed that, one third of the studied nurses were in age group from 20 to less than 25 years old and one quarter of them between ages 25 < 30 years old with mean age 29.5 ± 6.23 . This finding is consistent with **Adzitey (3)** in a study entitled "Knowledge and Attitude of Nurses in the Tamale Metropolis toward Kangaroo Mother Care" who found that the age of less than three quarters of nurses were between the ages of 21 to 30 years old.

Also, **Ferreira (11)** in a study entitled "Kangaroo Method: Perceptions on Knowledge, Potentialities and Barriers among Nurses" who reported that less than two fifths of nurse were aged less than 25 years old. However, this finding is inconsistent with **Shattnawi (29)** in a study entitled "Neonatal Nurses' Knowledge and Beliefs about Kangaroo Mother Care in Neonatal Intensive Care units" who found that mean age of studied nurses was 32.49 ± 6.079 .

From researcher's point of view, this may be due to this age group $20 < 25$ is the common age of neonatal nurses who give care for preterm infants in the **NICU**.

Regarding to gender, the finding of the present study revealed that more than three quarters of studied nurses were female. This finding agrees with (5) in a study entitled "Kangaroo Care Education Effects on Nurses' Knowledge and Skills Confidence" who found that most of participants were female nurses.

In addition to **Aagaard (1)** who found that more than three quarters of subjects were female nurses. Also this result is supported by (32) in a study entitled "Neonatal Intensive Care Nurses' knowledge and Beliefs Regarding Kangaroo Care in China" who found that most subjects were females.

This result may be attributed to the fact that the number of male nursing in Egypt remains persistently little. Additionally, nursing as a profession often faces the challenges of gender discrimination, especially in specialties like obstetrics, gynecology and neonates, where, female often prefer, while male nurses often end up in leadership roles and in specialties like intensive care, emergency and operating room nursing

Concerning the educational level, the result of this study revealed that half of studied nurses had technical institute of nursing education. In the same context, **Mörelis (22)** in a study entitled "Neonatal Nurses' Beliefs about Almost Continuous Parent Infant Skin to Skin Contact in Neonatal Intensive Care" reported that the majority of nurses had technical institute of nursing education.

Also this result is supported by **Khalil (16)** in a study entitled "Pediatric nurses' perception and practices regarding neonatal discharge from neonatal intensive care" found that more than half of studied nurses had technical institute. However, this finding is inconsistent with the finding of (29) who found that majority of studied nurses had bachelor degree.

This result may be attributed to that technical institutes of nursing provide the Egyptian community with large number of nurses' graduates than other agencies such as faculty of nursing, nurses had bachelor degree prefer to work abroad.

In relation to the years of experience, the result of this study revealed that one third of nurses had years of experience from $1 < 5$ years. This finding goes in line with **Mohamed (21)** in a study entitled "Assessment of Nursing Care Provided to Premature Neonates at Neonatal Intensive Care Unit at Zagazig University Children Hospital" who found that slightly more than one third of nursing staff had experience less than 5 years.

In contrast to this study, **Solomons (30)** entitled " Knowledge and Attitudes of Nursing Staff and Mothers Towards Kangaroo Mother Care in the Eastern Eub-district of Cape Town" found that more than half of nursing staff had between one and five years' work experience.

Regarding attending training program for **KC**, the result of this study revealed that more than three quarter of nurses had not attending training program for **KC**. This result is in agreement with **Solomons (30)** who found that three fifths of the nursing staff did not have any **KC** training. This finding is inconsistent with **Kymre (18)** in a study entitled " NICU Nurses' Ambivalent Attitudes in Skin-to-skin Care Practice" who found that more than half of studied nurse had training programs regarding **KC**.

This result may be attributed to the study setting increased work load in **NICU**.

Part II: Characteristics of the Preterm Infants

Owing to gender, the result of this study (table2) revealed that less than two third of preterm infant were female. This result goes in the same line with (24) in a study entitled "Gender Disparities in Preterm Neonatal Outcomes" who reported that three quarters of the preterm infants were female. In contrast to **Veroneza (31)** in a study entitled "Experience of Mothers of Premature Babies from Birth to Discharge" found that more than half of preterm infant were male.

Regarding the gestational age, the result of the current study revealed that more than half of studied preterm infant had gestational age from 34 to less than 36 weeks with mean 32.45 ± 4.06 . In the same context, (4) in a study entitled "Quality of Nursing Care Provided for Neonates with Trachea Esophageal Fistula" found that the mean of gestational age was 33.75 ± 0.36 weeks.

Also this result is supported by **Kassahun (15)** in the study entitled "Knowledge, Attitude, Practice and Associated Factors of Kangaroo Mother Care for Neonatal Survival among Care Takers of Preterm and Low Birth Weight Infants in Health Care Settings" who reported that less than three fifths of infant had gestational age 32 week to less than 37 weeks.

Owing to Medical Diagnosis, the result of the current study showed that neonatal jaundice was the diagnosis in less than half of preterm infant. This result goes in the same line with **Pawan (25)**, in a study entitled "Study of Neonatal Jaundice in A Tertiary Care Center in Eastern Bihar" who reported that less than half studied newborns developed clinical jaundice. Also this result is supported by **Abd El Muktader (2)** in a study entitled "Hyperbilirubinemia in Neonatal Intensive Care Unit: Incidence and Etiology at Fayoum University Hospital" who found that less than half of neonates attending NICU due to jaundice.

This result may be attributed to that preterm infant hyperbilirubinemia is the most common reason for admission of preterm infant to NICU.

Pertaining birth weight, the result of the current study revealed that one third of studied preterm infant had weight less than 1000 gm. with mean 1441.66 ± 125.4 gm. This result is consistent with **Kassahun (15)** who reported that one third of infant had very low birth weight. Also this result is supported by **(30)** who reported that the mean birth weight was 1.37 ± 0.35 kg.

Regarding to birth order, the result of the current study showed that less than half of studied preterm infant were the first infant in their family. This result is consistent with **Haidari (14)** in a study entitled "Hospital Variation in Admissions to Neonatal Intensive Care Units by Diagnosis Severity and Category" who found that slightly more than two fifths were had the first order. In contrast to this study, **Kim (17)** in a study entitled "The Effects of Birth Order on Neonatal Outcomes" documented that less than one quarter of the studied neonates were the first infant to their families.

Concerning total knowledge level, the result of the present study (figure 1) revealed that less than half of studied nurses had average knowledge. While, less than one third of them had poor knowledge. This result is consistent with **Raouth (26)** who found that, nurses had inadequate knowledge regarding KC.

Also, **Khalil (16)** who found that the nurses' had partial or fragility knowledge about the KC. Additionally, **Al-shehri (7)** documented that nurses had a reasonable knowledge regarding KC.

In contrast to this study, **Flynn (12)** in the study entitled "Neonatal Nurses' Knowledge and Beliefs Regarding Kangaroo Care with Preterm Infants in an Irish Neonatal Unit" Reported that the overall level of Neonatal Nurses' knowledge of kangaroo care varied from good to excellent.

Concerning total perception level, the result of the present study (figure2) revealed that three fifths of studied nurses had negative perception regarding kangaroo care. This result is consistent with **Bang (9)**, in a study entitled "Perception of Nurses and Physicians in Neonatal Intensive Care Units on Kangaroo Care" who found that nurses showed a negative perception in providing kangaroo care for preterm infants.

Also, **Mgolozeli (20)** in a study entitled "Nurses and Midwives' Perceptions of Skin-to-Skin Contact between the Mother and Baby after Birth in Selected Rural Primary Healthcare Facilities in Schoonoord, Limpopo Province, South Africa" who reported that participants had negative perception to implementation of skin-to-skin contact.

On contrary of this study **Solomons (30)** who reported that the majority of the nursing staff had positive perception toward KC. In addition to **Aagaard (1)** documented that a good proportion of nurses have a positive perception towards KC.

Concerning total practice level, the results of the present study revealed that less than two third of studied nurses had unsatisfied practice toward KC. This result is consistent with **Deng (10)**, in the study entitled "Factors that have an Impact on Knowledge, Attitude and Practice Related to Kangaroo Care: National Survey Study among Neonatal Nurses" who documented that neonatal nurses' practice levels related to KC were relatively low.

Also, **Khalil (16)** reported that the nurses' lack of practical experience regarding to KC. Additionally, **Ferreira (11)**, in a study entitled "Pediatric Nurses' Perception and Practices Regarding Neonatal Discharge from Neonatal Intensive Care" found that the pediatric nurses had poor practice regarding KC.

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In contrast with this study, **George (13)** found that, the majority of the studied subjects had good scores related to the practice of **KC** technique.

From researcher's point of view, this result may be attributed to many factors that affect nurses implementing the **KC**; lack of training and insufficient knowledge regarding **KC**, and overloading work in the **NICU**. Hence, this result indicates continuing training is the way to qualify and prepare nurses for the development of skills related to the **KC**.

5. CONCLUSION

On the light on the finding of the current study, it can be concluded that:

Less than half of studied nurses had average knowledge and three fifth of them had negative perception regarding **KC**. However, less than two third of studied nurses were unsatisfactory regarding **KC**. There was highly statistical significance relation between total knowledge of nurses and their age and years of experience. In addition to, there was positive significance correlation between total nurses' knowledge, perception and practices

6. RECOMMENDATIONS

Based on the results of the present study the following recommendation is suggested:

- Develop an educational program to meet the actual need of the nurses at **NICU** regarding kangaroo care.
- Continuous training and periodic assessment for neonatal nurses about knowledge, perception and practice regarding **KC**.
- Assess obstacle that affect nursing performance regarding **KC**.
- Practice **KC** more systematically and consistently to enhance nurses' adaptation and to build trust between preterm infants and their parents.
- Provide neonatal nurses with instruction booklet regarding **KC**.
- Use **KC** for preterm infant as a part of routine care in the **NICU**.

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