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## Nurses' Knowledge and Practice Regarding Developmental Supportive Care for Preterm and Low Birth Weight Infants

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### ABSTRACT

**Background:** Developmental supportive care recognizes the physical, psychological and emotional vulnerabilities of premature and low birth weight infants. **The aim of this study** was to assess knowledge and practice of nurses regarding developmental supportive care for preterm and low birth weight infants in Neonatal Intensive Care Unit (NICU). **Subjects and method: design:** A descriptive design was used, the study was carried out on 180 nurses at the governmental hospitals at Mansoura City. **Tools:** Tool (1) Structured interview for nurses' personal characteristics and their knowledge about preterm infant and developmental supportive care. Tool (2) an observational checklist for nurses' practice of developmental supportive care for preterm and low birth weight infants during daily nursing care procedures. **Results** revealed that most of the studied nurses had satisfactory level of knowledge regarding developmental supportive care for preterm and low birth weight infants while of them had inadequate practice of developmental supportive care for preterm and low birth weight infants, there were no statistically significant relation between nurses' knowledge and their actual practice ( $p < 0.05$ ). **Conclusion:** 64.4% of the studied nurses had satisfactory level of knowledge regarding developmental supportive care for preterm and low birth weight infants, while more than half of studied nurses (56.7%) had inadequate level of practicing developmental supportive care for preterm and low birth weight infants. **Recommendations.** Setting training and educational programs for nurses to improve their knowledge and their performance regarding developmental supportive care for preterm and low birth weight infants .

**Key words:** Developmental supportive care, Preterm, low birth weight infants.

## INTRODUCTION

Prematurity is defined as a birth that occurs before 37 completed weeks (less than 259 days) of gestation. It is associated with approximately one-third of all infant deaths. Infants born at or before 25 weeks of gestation have the highest mortality rate (about 50 percent) and if they survive, are at the greatest risk for severe impairment (Mandy, Weisman, & Kim, 2015). Low birth weight (LBW) is defined as body weight less than 2500g Centers for Disease Control & Prevention (2015).

Today, prematurity and its effects on neonates, families, and societies have risen to the world's policy stage. The recognition that most prematurity is preventable creates the "perfect storm" for professional organizations, private and public corporations, nongovernmental organizations, and governmental groups to collaborate to improve health outcomes for this most vulnerable population. The council of international neonatal nurses unites neonatal nursing globally to bring the nursing perspective to this work (Kenner & New, 2015).

Developmentally care is widely practiced in NICUs in developed nations to help minimize risks to infant development (Carroll, 2015). Also, used to minimize infant's stress in the NICU through control of external stimuli like light and sound, clustering of daily care (feeding, diaper changes etc.), positioning or swaddling, and calming techniques (Symington & Pinelli, 2009).

The goal of developmental care is to provide a structured care environment which supports, encourages and guides the developmental organization of the premature and/or critically ill infant. It recognizes the physical, psychological and emotional vulnerabilities of premature and/or critically ill infants and their families and is focused on minimizing potential short and long-term complications associated with the hospital experience (Coughlin, Gibbins, & Hoath, 2009).

**Significance of the study:** Preterm infants in NICUs are exposed to numerous stressors, including painful stimuli, disruption of sleep, excessive noise and light levels, frequent handling associated with medical or nursing procedures, and maternal separation and disrupted parenting. In an effort to improve developmental outcomes, management has shifted toward neuro protective strategies and early developmental supportive care (Wielenga et al., 2009).

### **AIM OF THE STUDY:**

The aim of the present study is to assess nurses' knowledge and practice regarding developmental supportive care for preterm and low birth weight infants in neonatal intensive care unit (NICU).

Research questions:

- What are nurses' knowledge regarding developmental supportive care for preterm and low birth weight infants?
- What are nurses' practice regarding developmental supportive care for preterm and low birth weight infants?
- Is there a relation between nurses' knowledge and practice regarding developmental supportive care and their characteristics?

**Research design:** A descriptive research design was utilized in the conduction of the study.

**Setting:** The study was conducted at neonatal intensive care units in governmental hospitals in Mansoura city:

**Subjects:** A convenience of sample compromised of all nurses (180 nurses) working in NICU of the above mentioned settings.

### **TOOLS OF DATA COLLECTION:**

**Tool (1):** A structured interview, it was developed by the researcher after reviewing relevant literature. It was designed in simple Arabic language to suit all nurses' categories. It consisted of the following parts.

**Part (1):** This part covered the personal characteristics of studied nurses.

**Part (2):** This part was concerned with nurses' knowledge about preterm infants and developmental supportive care; it divided into four parts as the following:

- Questions about preterm and low birth weight infant.
- Questions about developmental supportive care.
- Questions about applying kangaroo care for preterm and low birth weight infants.
- Questions about applying massage and positive touch for preterm and low birth weight infants.

**TOOL (II): Observational Check List:** It was developed by the researcher after reviewing relevant literature. It was used to assess the actual developmental supportive care provided by nurses for preterm and low birth weight infants in NICU.

**Preparatory phase:** During this phase the researcher reviewed local and international related literature in various aspects of developmentally supportive care given to preterm and low birth weight infant using available national and international scientific journals, articles, books and internet.

**Content validity of the tools:** Once the tools were prepared in their preliminary forms, they were presented to a panel of seven experts in field of pediatric nursing. The tools were then adjusted based upon the recommendations of these experts.

**Reliability of tool:** It was held on 18 nurses of the study group. Cronbach alpha coefficient was used to assess the internal consistency of the tool.

**Pilot study:** A pilot study was carried out after reviewing of data collection tools by seven experts. It was applied on 10% (18) of study sample. Based on the findings of the pilot study were not included in the main sample since some modifications were done in the tools in the form of rephrasing some items.

**Filed work:** The actual fieldwork was carried out over the period from the beginning of September 2015 up to the end of February 2016 for data collection. Before distributing the questionnaire, the purpose of the study was explained to each nurse. The researcher observed the performance of each nurse while providing actual care for neonates by indirect observation guided by observation checklists in the morning, afternoon and night shifts. The researcher collect data three days per week, each observation & explanation take about 20 minutes.

**ADMINISTRATIVE DESIGN:** To carry out the study, the necessary approvals were obtained from each hospital directors as well as nursing directors. Official letters were issued to them from the Faculty of Nursing, Port Said University, explaining the aim of study in order to obtain their permission and cooperation.

**Ethical consideration:** Prior to the conduction of the study the aim of the study was explained to managers of hospitals and managers of NICU to obtain permission to conduct the study. The purpose and procedures of the study were explained clearly and simply to every nurse. Nurses also informed that they are allowed to choose to participate or not in the study and they have the right to withdraw from the study at any time.

**STATISTICAL DESIGN:** Data entry and statistical analysis were done using SPSS 20.0 statistical package for social sciences). Data were presented using descriptive statistics in the form of frequencies and percentages for quantitative variables. Qualitative categorical variables were compared using. Comparison chi-square test. Significant was considered at p-value <0.05.

## RESULTS:

**Table (1):** shows the frequency distribution of personal characteristics of the studied nurses, as regards their age, it showed that, the highest percentage of the studied nurses (46.1%) their age ranged between 25 to less than 30 years old with a mean  $27.57 \pm 5.3$  years.

According to qualifications of nurses, it found that more than two-third of the studied nurses (69.4%) had a bachelor degree, while 16.7% of them had secondary technical school of nursing and the rest of them (13.9%) had technical institute of nursing.

Related to years of experience of studied nurses, the result clarified that, two-third of the studied nurses (66.7%) had 1-<6 years of experience in NICU, while the minority of them (3.9%) had 12-18 years of experience, with a mean of  $5.005 \pm 3.88$  years.

**Table (2):** indicates frequency distribution of total nurses' knowledge regarding preterm infant and developmental supportive care, it clarified that, 71.1% of the studied nurses had satisfactory level of knowledge regarding developmental supportive care, while the rest of them (28.9%) had un satisfactory level regarding the same point. On the other hand, the majority of the studied nurses (87.2%, 82.8%) respectively had un satisfactory level of knowledge regarding kangaroo care, and massage, while the rest of them 12.8% and 17.2% respectively of them had satisfactory level in the same point.

**Table (3):** shows frequency distribution of nurse' overall total practice score of developmental supportive care during daily nursing care procedures, the result illustrated that, more than three-quarter of the studied nurses (83.3%) had adequate practice score of developmental supportive care during growth parameter assessment, while the rest of them (16.7%) had inadequate practice. It also showed that, 72.8% of the studied nurses had inadequate practice of developmental supportive care during hygiene care, while only 27.2% of them had adequate practice.

According to nurses' practice total score of massage and kangaroo care, it clarified that, 68.3%, 69.4% respectively of the studied nurses had inadequate practice, while the rest of them (31.7%, 30.6%) respectively had adequate practice. It also illustrated that, 56.7% of the studied nurses had inadequate total practice score, while the rest of them (43.3%) had adequate total practice score.

**Table (4):** shows relation between nurses' total knowledge score and their total practice score. It indicated that, there were no statistically significant relation between nurses' total knowledge score and their total practice score ( $p=.180$ ).

**Table (1):** Frequency distribution of personal characteristics of studied nurses (n = 180)

<b>Socio-demographic characteristics</b>	<b>No</b>	<b>%</b>
<b>Age (years):</b>		
<20	6	3.3
20-<25	56	31.1
25-<30	83	46.1
30+	35	19.5
<b>Mean ± SD</b>	<b>27.57±5.3</b>	
<b>Qualification:</b>		
Secondary school.	30	16.7
Technical institute.	25	13.9
Bachelor degree.	125	69.4
<b>Experience :</b>		
1 - < 6 years	120	66.7
6 - < 12	53	29.4
12 - 18 years	7	3.9
<b>Mean ± SD</b>	<b>5.005 ± 3.88</b>	
<b>Attain training programs:</b>		
Yes	5	2.8
No	175	97.2
<b>Courses: (n=5)</b>		
Growth assessment	3	60.0
Hygienic care for the neonates	2	40.0
<b>Total</b>	<b>180</b>	<b>100.0</b>

**Table (2):** Frequency distribution of total score of the studied nurses' knowledge regarding preterm infant and developmental supportive care. n= (180).

Nurses' knowledge	Un satisfactory		Satisfactory	
	No	%	No	%
Preterm infant	61	33.9	119	66.1
Developmental supportive care	52	28.9	128	71.1
Kangaroo care	157	87.2	23	12.8
Massage	149	82.8	31	17.2
<b>Total</b>	<b>64</b>	<b>35.6</b>	<b>116</b>	<b>64.4</b>

**Table (3):** Frequency distribution of studied nurses' overall practice score of developmental supportive care during daily nursing care procedures (n= 180).

Total score of nurses' practice	Inadequate		Adequate	
	No	%	No	%
<b>Growth parameter assessment</b>	30	16.7	150	83.3
<b>Hygiene care</b>	131	72.8	49	27.2
<b>Feeding</b>	28	15.6	152	84.4
<b>Invasive procedures</b>	113	62.8	67	37.2
<b>Massage</b>	123	68.3	57	31.7
<b>Kangaroo care</b>	125	69.4	55	30.6
<b>Overall</b>	<b>102</b>	<b>56.7</b>	<b>78</b>	<b>43.3</b>

**Table (4):** Relation between studied nurses' total knowledge score and their total practice score. n= (180).

Items	Total knowledge level				Total		X <sup>2</sup>	p-value
	Un satisfactory		Satisfactory					
	No	%	No	%	No	%		
<b>Total practice level</b>							<b>1.797</b>	<b>.180</b>
Inadequate	32	50.0	70	60.3	10	56.7		
Adequate	32	50.0	46	39.7	78	43.3		
<b>Total</b>	<b>64</b>	<b>100.0</b>	<b>116</b>	<b>100.0</b>	<b>180</b>	<b>100.0</b>		

**DISCUSSION:**

The present study was carried out to assess nurses' knowledge and practice regarding developmental supportive care for preterm and low birth weight infants. The findings of present study generally indicate satisfactory level of nurses' knowledge regarding developmental supportive care and inadequate level of practice of developmental supportive care for preterm and low birth weight infants during daily nursing care procedures.

According the present study findings, nearly two-third of the studied nurses had satisfactory level of knowledge regarding developmental supportive care for preterm and low birth weight infants; this might be due to knowledge that nurses attained during their years of education in diploma, institute or bachelor of nursing. this result was in the same line with *Hendricks-Muñoz et al. (2010)* In evaluating beliefs regarding the general concepts of developmental care, results demonstrated that neonatal nurses held similarly strong beliefs related to the importance of sound, light, and touch parameters of developmental care regardless of type of training, leadership staff, and team staffing .

As regarding the actual nurses' practice regarding developmental supportive care for preterm and low birth weight infants in NICU, the results of the current study showed that more than half of the studied nurses had inadequate practice of developmental supportive care during daily procedures. This might be due to the fact that there were only five of the studied nurses attained training programs regarding care of preterm infants, and due to the philosophy of hospitals which didn't put developmental supportive care as a principal item in its ways of administration. In the same line, Valizadeh et al. (2013) in their study "The Congruence of Nurses' Performance with Developmental Care Standards in Neonatal Intensive Care Units" found that nurses' performance with standards of developmental care still requires more efforts. Therefore, it is necessary to train the staff in this regard and prepare them for structural and functional facilities.

A main objective of the present study was to assess nurses' knowledge and their actual practice of developmental supportive care for preterm and low birth weight infant during daily nursing care procedures. The findings revealed that although nurses agreed that elements of developmental supportive care are necessary for the preterm and low



birth weight infant, they do not consistently apply those elements in their everyday practice .

According to result of present study, near half of the studied nurses who had unsatisfactory level of knowledge regarding developmental supportive care had a bachelor degree in nursing. This might be because developmental supportive care is a new concept in care of preterm and low birth weight infant and the studied nurses did not attain enough knowledge regarding developmental supportive care of preterm and low birth weight infant during years of education.

The present study also revealed that, nearly three-quarters of studied nurses who had inadequate practice of developmental supportive care during daily nursing care procedures had a bachelor degree in nursing. This might be due to the fact that almost of the studied nurses didn't attain training programs regarding developmental supportive care for preterm and low birth weight infants.

An important finding of the present study is that high percent of the studied nurse had poor level of practicing developmental supportive care for preterm and low birth weight infant during invasive procedure to relief the pain. This result is in the same line with Asadi-Noghabi et al. (2014) in their study; Neonate Pain Management: What do Nurses Really Know? They conducted that the nurses had poor performance regarding the assessment, measurement, and relief of pain. However, they showed positive attitudes towards pain control in neonates.

According to findings of the present study, there was lack of nurses' knowledge about proper positioning of preterm and low birth weight infants and also inadequate practice of positioning during daily nursing care procedures. It might be due to lack of training programs regarding developmental supportive care and lack of equipment to apply proper positioning in incubators; this disagreed with Zarem et al. (2013). who study: Neonatal Nurses' and Therapists' Perceptions of Positioning for Preterm Infants in the Neonatal Intensive Care Unit, conducted that, Ninety-nine percent of nurses agreed that positioning is important for the well-being of the infant.

In studying the relation between the studied nurse's total mean scores of knowledge and their age, the finding of the current study viewed that, there was no statistical significant relation between the studied nurse's total mean scores of knowledge and their age ( $p < 0.05$ ).

According to the present study finding, there were significant relation between nurses' knowledge score and level of education, at the same line with *Asadi-Noghabi (2014)*, who detected that, the knowledge scores of participants had a mean value of 13.51 (48.2%) out of 28. There was a significant relationship between nurses' knowledge scores and the level of education.

As regards relation between the total studied nurse's mean scores of knowledge and their years of experiences, there was statistically significance relation between the total studied nurse's mean scores of knowledge and their years of experiences. This finding agreed with Abd El- Galil (2007) studied monitoring quality of nursing care in neonatal unites at hospitals affiliated to Ministry of Health (Dakahalia Governate), and found that, there was a statistical significance relation between nurse's knowledge and their years of experiences. In addition, Shrestha (2013) indicated that respondents are highly knowledgeable with working experience for over 5 year, respondents are with average knowledge with working experience of less than 5 year .

As regards relation between the total studied nurse's mean scores of practice and their age, there was no statistically significance relation between the total studied nurse's mean scores of practice and their age with ( $p>0.05$ ), that disagreed with Ahmed et al (2014) who found that there was statistically significance relation between nurse's level of practice and their age ( $p<0.05$ ).

In studying the relation between the studied nurse's total mean scores of practice and their years of experiences, there was statistically significance relation between the total studied nurse's mean scores of practice and their years of experiences with ( $p<0.05$ ), this agreed with Abou Ahmed (2013) who found that there was statistically significance relation between nurse's level of practice and their years of experience ( $p<0.05$ ).

On the basis of the results the researcher concludes that there were knowledge gap and lack of practices performance related to some statements exist among nurses in the locality concerning developmental supportive care for preterm and low birth weight infants and its management. The study indicated that there is no significant association between nurses' knowledge and practices .

In the same field Victora & Rubens (2010) concluded that shortages of qualified health workers and inadequate training and skills for the care of premature babies are a major reason for poor progress in reducing neonatal deaths. Nurses or midwives with skills in

critical areas such as resuscitation, safe oxygen management, and breastfeeding support are the frontline worker for premature babies.

### **CONCLUSION:**

In the light of the present study findings, it was concluded that , 64.4% of the studied nurses had satisfactory level of knowledge regarding developmental supportive care for preterm and low birth weight infants , while more than half of studied nurses (56.7%) had inadequate level of practicing developmental supportive care for preterm and low birth weight infants. The current study findings concluded that, there were no statistically significant differences between nurses' knowledge and practice level ( $p > 0.05$ ).

### **RECOMMENDATIONS:**

Based on the findings of the present study, the following recommendations are to be considered:

- Training programs should be applied for nurses in the neonatal intensive care units to improve their knowledge and practice regarding developmental supportive care for preterm and low birth weight infants.
- Workshops should be developed by the hospital administrative authority for neonatal nurses about developmental supportive care needed for preterm and low birth weight infants in NICU.
- A procedure manual for the developmental supportive care for preterm and low birth weight infants in NICU needs to be developed and standardized.
- Staff education relating to the psychosocial needs of NICU families and methods of providing support should be provided to all NICU staff.
- Replication of this study at different places in Egypt, and developing an educational program and conduct it on a larger sample size, different geographical areas.

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## معرفة وممارسة الممرضات فيما يتعلق بالرعاية الداعمة التنموية للخدج والرضع منخفضي وزن الولادة في وحدة العناية المركزة لحديثي الولادة

### الخلاصة

الخلفية: تدرك الرعاية الداعمة التنموية نقاط الضعف الجسدية والنفسية والعاطفية للرضع المبتسرين ومنخفضي وزنهم عند الولادة. كان الهدف من هذه الدراسة هو تقييم معرفة وممارسة الممرضات فيما يتعلق بالرعاية الداعمة التنموية للخدج والرضع منخفضي وزن الولادة في وحدة العناية المركزة لحديثي الولادة (NICU). الموضوعات والطريقة: التصميم: تم استخدام التصميم الوصفي ، وأجريت الدراسة على 180 ممرضة في المستشفيات الحكومية بمدينة المنصورة. الأدوات: الأداة (1) استبيان مقابلة منظم للخصائص الشخصية للممرضات ومعرفةهم بالرضع الخدج والرعاية الداعمة التنموية. الأداة (2) قائمة مرجعية قائمة على الملاحظة لممارسة الممرضات للرعاية الداعمة التنموية للخدج والرضع منخفضي وزن الولادة أثناء إجراءات الرعاية التمريضية اليومية. أظهرت نتيجة هذه الدراسة أن معظم الممرضات الخاضعات للدراسة كان لديهن مستوى مرضٍ من المعرفة فيما يتعلق بالرعاية الداعمة التنموية للخدج والرضع منخفضي وزن الولادة بينما لم يكن لديهم ممارسة كافية للرعاية الداعمة التنموية للخدج والرضع منخفضي الوزن عند الولادة ، ولم يكن هناك إحصائياً. علاقة ذات دلالة إحصائية بين معرفة الممرضات وممارساتهم الفعلية ( $P < 0.05$ ). الاستنتاج: 64.4% من الممرضات الخاضعات للدراسة لديهن مستوى مرضٍ من المعرفة فيما يتعلق بالرعاية الداعمة التنموية للخدج والرضع منخفضي وزن الولادة ، في حين أن أكثر من نصف الممرضات الخاضعات للدراسة (56.7%) لديهن مستوى غير كافٍ من ممارسة الرعاية الداعمة التنموية للخدج وانخفاض وزن الولادة. الرضع. التوصيات. وضع برامج تدريبية وتعليمية للممرضات لتحسين معرفتهم وأدائهم فيما يتعلق بالرعاية التنموية الداعمة للخدج والرضع منخفضي وزن الولادة.

**الكلمات المرشدة:** الرعاية التنموية الداعمة ، الخدج ، منخفضو الوزن عند الولادة.