

Assessment of Nursing Care Provided to Premature Neonates at Neonatal Intensive Care Unit at Zagazig University Children Hospital

Bataa Mahmoud Mohamed⁽¹⁾, Amal Mohammed El Dakhkhny⁽²⁾ Samah El-Awady Bassam⁽³⁾ & Lotfy Mohamed El Sayed⁽⁴⁾

⁽¹⁾ Assistant Lecturer, Pediatric Nursing Dep., Faculty of Nursing, Zagazig University.

⁽²⁾ Assistant Professor of Pediatric Nursing, Faculty of Nursing, Zagazig University

⁽³⁾ Lecturer of Pediatric Nursing, Faculty of Nursing, Zagazig University

⁽⁴⁾ Professor of Pediatric, Faculty of Medicine, Zagazig University

Abstract:

Premature neonate who is born before 37th week of gestation, having one or more complication and is treated in the neonatal intensive care unit. Neonatal intensive care unit is a healthcare unit designed for critically or seriously ill neonates who are unable to communicate their needs or who require deliberate planned observation, and highly skilled nursing care. **The aim** of the present study was to assess nursing care provided to premature neonate at neonatal intensive care unit at Zagazig University Children Hospital. **A descriptive** design was utilized in the present study. The study was **conducted at** Neonatal Intensive Care Unit at Zagazig University Children Hospital. The **study subjects** included 22 nurses working in neonatal intensive care unit. **Two tools** were used; first a questionnaire sheet for nurse's characteristics and the second tool was an observational checklist used to assess nurse's practice. The study **results** indicated that all of the studied nurses had both satisfactory and unsatisfactory levels regarding their practice. The study findings **concluded** that nurses were incompetent in providing care to premature neonates. The main study **recommendations** included, in-service educational program to update nurses' practice should be conducted and nurse's practice should be adequately supervised by head nurse as well as proper feedback should be given to nurses to improve quality of care of premature neonates and booklets of critical procedures for premature neonates should be available at the unit.

Key words: Assessment, Premature neonate, Neonatal intensive care unit, Nursing care

Introduction

Improving quality of nursing care in every hospital requires utilizing personnel to their fullest potential. Nurses must be educationally prepared and clinically skilled in order to be capable of rendering competent scientific care to premature neonate (Zapata, 2007). Hatfield (2007) defined high risk neonate as a newborn has a greater chance of complications because of conditions that occur during fetal development, pregnancy conditions of the mother, or problems that may occur during labor and birth. Premature neonates (less than the

full 37th weeks of pregnancy) account for approximately 7% of all deliveries and are classified as preterm (Pillitteri, 2003). Kopleman (2009) stated that the reasons for premature birth are frequently unknown. However, the risk of premature birth is higher among adolescents and older women, low socioeconomic status, as well as inadequate prenatal care, and also those with multiple fetuses (twins, triplets, quadruplets). Poor nutrition and untreated infections, such as urinary tract infections or sexually transmitted diseases, during pregnancy

also increase the risk of premature birth. Other women at increased risk of premature birth are those who have had a previous premature birth or who themselves have serious or life-threatening disorders, including heart disease, severe high blood pressure, kidney disease, preeclampsia or eclampsia.

Premature neonates are at increased risk for specific neonate health complications, as hypothermia, respiratory distress syndrome, poor nutrition, infection, hyperbilirubinemia, and even death. Many premature neonates require care in a neonatal intensive care unit (NICU), which has specialized medical staff and equipment that can deal with the multiple problems faced by premature neonates (**Potter, 2008**).

Wong, Hockenberry & Wilson (2007) added that nursing care is like the therapeutic care which is individualized for each neonate. Nurses must be aware of the special needs of the preterm neonate and must incorporate appropriate interventions to meet these needs including maintenance of their respiration, keeping their temperature within normal, sustaining skin integrity as well as parent bonding. Moreover, nurses should be able to provide adequate amount of nutrients and protect the premature neonates from potential fluid volume deficient and infections.

Nettina (2005) mentioned that nursing care is a critical element in the neonate's chance for survival. It involves a variety of unique functions, skills and responsibilities that are all essential in order to assess, understand safety, and support the preterm neonates during this critical time. Staff members working in NICU spend most of their time in caring for preterm neonates. Thus, they all are sharing the

responsibility for most of morbidity in this period.

Aim of the study:

The aim of the present study was to: Assess nursing care provided to premature neonates in Neonatal Intensive Care Unit at Zagazig University Children Hospital.

Research Question:

Do nurses provide proper nursing care to premature neonates in the Neonatal Intensive Care Unit at Zagazig University Children Hospital?

Subjects and method

Research Design

A descriptive research design was used in this study.

Setting

The study was conducted at the Neonatal Intensive Care Unit at Zagazig University Children Hospital.

Subjects:

All nurses who provide direct nursing care to the premature neonates (22 nurses) and had the following criteria:

- Had nursing diploma certificate.
- Unless than 6 months of experience.

Tools for Data Collection

Tool I: Questionnaire Sheet:

It was developed by the researcher and included: characteristics of nurses such as: age, years of experience, level of education, and attended any training programs about prematurity.

Tool II: Observational Checklist for Nurses' Practice of neonatal care:

The tool was developed by the researcher to observe nurses' practice

provided to premature neonates regarding hypothermia, respiratory distress syndrome, infection, poor nutrition as well as hyperbilirubinemia.

Scoring System:

Total nurses' practice score was developed by the researcher. Each observed item was checked as satisfactory or unsatisfactory. The total score was 206 points distributed as follows:

I- Routine Nursing Care: (144 point)

- Measuring vital signs (15 points).
- Care during bottle feeding (22 points).
- Skin care (3 points).
- Eye care (13 points).
- Cord care (13 points).
- Protection from infection (22 points).
- Daily care of incubator (14 points).
- Care during laboratory tests (4 points).
- Medication administration (3 points).
- Quiet environment (7 points).
- Maintain parent-neonate bonding (10 points).
- Terminal care of incubator (18 points).

II- Nursing Care provided to the Problems: (62 point)

- Neonates with thermoregulation disorders (10 points).
- Neonates with respiratory distress disorders (13 points).
- Neonates during gavage feeding (17 points).

- Neonates under phototherapy (22 points).

The total score of nurses' practice was classified as follows:

- Unsatisfactory $\leq 60\%$.
- Satisfactory $> 60\%$.

Pilot Study

A pilot study was conducted on 10% of nurses to test the clarity of questions and to estimate the time required for filling the sheet. No modifications were Satisfactory and the sample was added to the total study.

Field work:

Data was collected through 7 months, starting from January 2009 to July 2009. Each nurse was individually interviewed to collect necessary data using tool I. And each nurse was observed 3 times, once every shift. Consequently, using tool II. The time consumed to observe each nurse ranged from 30-45 minutes.

Administrative and Ethical Consideration:

An official permission will be obtained using proper channels of communications prior to pilot study. And an informed consent was obtained from the nurses to accept to participate in the study total confidentiality of any obtained information will be ensured.

Statistical Analysis:

The collected data was coded and entered in a data base file using the FoxPro for windows program. After complete entry, data was transferred to the SPSS version 12.0 program by which the analysis was conducted applying frequency tables with percentages and cross tabulations. The tests of significance used were the Chi-

square. Qualitative variables presented as number and percent.

Results:

Table (1) shows that a total number of 22 staff nurses were included in this study. Those who aged 20 – 30 years constituted 40.9% of the studied nurses, and 22.7% aged <20 years old, with mean age of 25.9 ± 6.9 years.

Regarding years of experience, 40.9% of the studied nurses had more than 10 years of experience and 31.8% of them had less than 5 years, with mean of 8.6 ± 6.93 years experience.

As regard qualification, 86.4% of studied nurses had diploma degree, and 13.6% had technical institute of nursing. None of the nurses in the sample had a bachelor degree in nursing.

The same table portrays that 54.5% of studied nurses never attended any previous training program about premature care compared to 45.5% who had attended.

Table (2) revealed that all studied nurses (100%) measured vital signs through measuring neonatal temperature and evaluating symptoms and signs of hypothermia and hyperthermia.

All studied nurses provided the essential care during bottle feeding such as washing hands, preparing equipments, as well as using proper technique in addition boil all equipment except rubber articles for 10 minutes and boil nipple and rubber articles for 3 minutes. As well as boil water in teakettle or pan for 5 minutes, check temperature of milk by pouring one or two drops in inner aspects of wrist and let the neonate root for nipple by touching the corner of his mouth with the nipple. When open his mouth, insert the nipple.

Skin care was assessed by 68.2% of the studied nurses. Skin color, signs of skin infection and irritation of skin were evaluated. In contrast, 31.8% of the studied nurses didn't assess.

When nurses were observed for cord care, 95.5% of the studied nurses provide it accurately by alcohol. On the other hand 4.5% of them didn't provide cord care.

As regard preventing infection, 54.5% of the studied nurses washed their hands before and after caring for each neonate and wore gloves when in contact with bodily secretions. They kept the neonatal cord stump clean and dry. In addition, avoided sharing neonatal equipments, isolated the infected neonate and avoided infected persons to visit him. Among studied nurses 45.5% didn't provide any care.

All of the studied nurses provide daily care of incubator by disinfectant solution according to the hospital policy. The total mean score of nursing care of daily care of incubator was 75.6 ± 9.5 .

In addition also all of nurses provided care during laboratory tests as checking doctor's order, turning phototherapy light off when blood sample is being withdrawn. Also, they took blood sample by using aseptic technique and following up results.

During administration of medication, 90.9% of the studied nurses provided care such as checking doctor's orders, checking principle of giving medication and following aseptic technique. Conversely, 9.1% of them didn't provide any care during medication.

Quite environment was provided by 81.8% of the studied nurses to premature neonates compared to 18.2% who didn't. This was applied

through using isolation and aseptic technique for the unit, wearing overshoes, gown and mask, keeping adequate space between neonates and avoiding source of noise and drafts.

Regarding to nursing care to maintain parent – neonate bonding, 77.3% of the studied nurses didn't establish any relation. Only 22.7% of them were interested to establish it.

In table (3) as regard to nursing care of hypothermia, 95.5% of the studied nurses provided nursing care of hypothermia compared to 4.5% of them who didn't provide any care.

Regarding to nursing care of respiratory disorders, 81.8% of the studied nurses washed their hands, provided patent airway as well as suction if necessary. Moreover, checking respiration and watching movements of the chest for one minute. Only 18.2% of the studied nurses didn't provide any care.

All studied nurses provided the essential care during gavage feeding such as washing hands, preparing equipments, as well as using proper technique. In addition, they measure the tube for approximate length of insertion, lubricating the catheter with sterile water or lubricant, and checking temperature of the food.

Regarding to nursing care during phototherapy, all of studied nurses provided care through undressing the neonate, leaving a diaper in place to cover genitalia, covering eyes with protective eye shields, placing neonate under light for maximum skin exposure. Moreover, changing neonatal position every 2/ hours, and monitoring neonatal temperature every 2-3 hours. In addition, keeping skin specially diaper area clean. They provided feeding every 2 to 3 hours, stop phototherapy during feeding and during routine care, checking eye

during every shift, and monitoring bilirubin level. They discontinue therapy when ordered by the physician, check side effects of phototherapy as loose green stool, hyperthermia and dehydration.

Figure (1) illustrated that fifty five point six percent of the studied nurses had satisfactory practice score. While forty four point four of them had unsatisfactory practice score. .

Table (4) illustrated that there was statistical significant direct relation between practice level among studied group and their age when there is increase in nurses' age, there is increase in their practice score ($P < 0.05$).

Table (5) reveals that that there was no statistical significant relation between practical level among studied group and educational level ($P > 0.05$).

It is clear from **Table (6)** that there was no statistical significant relation between practical level among studied group and their years of experience ($P > 0.05$).

Discussion:

A neonatal intensive care unit is a critical setting which provides optimal care or chance for survival for neonates and is not like other critical areas; it receives a high risk group of neonates in critically ill conditions. The most common risk factor of neonatal admission to neonatal intensive care unit is prematurity (**Burroughs & Leifer, 2001**).

Concerning the demographic characteristics of the studied nurses, the present study showed that their age ranged from 20 – 30 years and all had nursing diploma degree as well as less than half of them were newly graduated and had experience less than 5 years. Also, more than one half of nurses did not attend any previous

training program about premature care. This finding goes in line with **Soliman, (2005)** who found in his study done at Zagazig University Hospital that all groups of nurses aged between 25-35 years and had nursing diploma of education, less than half of nurses were newly graduated and had experience less than 4 years. Also in the same line, **Abd El- Lateef, (2003)**, **Attia, (2001)** and **Gad Allah, (2007)** found in their studies done at Zagazig University Hospitals that the majority of the sample in their studies on nurses was having general diploma degree. While **Tantawy, (2000)** found in his study done at Zagazig University Hospitals that less than two thirds of the studied nurses were more than 5 years of experience and attended program training (table 1).

Umbilical cord is an important bacterial site and its infection is one of the common sources of neonatal infection. It could be prevented and reduced by performed procedure under aseptic technique (**Pezzati et al., 2002**). The present study revealed that nearly all the studied nurses were followed aseptic technique of cord care to premature neonate as well as it performed by all nurses every shift as it is a physician's order in neonatal sheet and it is the role of pediatric nurse. This go in line with **Blackburn, (2003)** who stated that when caring for the cord, nurses must wash their hands with clean water and soap before and after care and keep the cord dry and exposed to air or loosely covered with clean clothes. On the other hand, **Gad Allah, (2007)** found in his study that the least mean score of nurses didn't follow aseptic technique.

The present study findings revealed that the majority of studied nurses had provide incubator care; this is due to that incubator care in Neonatal Intensive Care Unit is a basic

component of infection control precautions which is practiced by all nurses in the unit. This finding disagrees with **Gad Allah, (2007)** who showed that the majority of nurses in his study had incorrect practice regarding incubator's care.

Brown, (2009) stated that quiet and rest has always been prescribed for ill neonates. Providing and maintaining a quiet, restful environment for ill neonates can foster neonatal growth and development. Perhaps the later developmental problems common to premature infants can be minimized or eliminated altogether merely by subduing excessive noise in the NICU. The present study showed that the majority of nurses provided care to keep quiet environment. This finding agree with **Gad Allah, (2007)** who showed that the majority of nurses had right answer about the items of effect of loud voice of neonate and active listening is very important art to the nurse. This finding was congruent with **Parente & Lowreiro, (2001)** who concluded that premature neonates in the neonatal intensive care unit are often exposed to continuous loud voice.

In the present study, all of studied nurses had performed steps of gavage feeding because nurses are aware that gavage feeding is the best method for neonatal feeding which decrease suckling effort and respiratory distress, as well as gavage feeding is considered one of the safest means for meeting the nutritional requirements of premature neonate who is too weak and unable to coordinate swallowing reflexes. This finding agrees with **Hussien (2002)** who found in his study done at Zagazig University Hospitals that the studied nurses showed best performance related to gavage feeding.

Phototherapy has an effect in treating all cases of jaundice in

neonatal intensive care unit. So the nurse must shield neonate eyes during exposure to phototherapy to prevent retinal damage, she should give extra fluid, monitor vital signs and observes side effects that may occur and evaluate the progress (**Wong et al., 2007**). The current study showed that the majority of nurses had high practice score about items of phototherapy.

The present study findings revealed that the total practice score varies between satisfactory and unsatisfactory. These findings disagree with **Gad Allah, (2007)** who showed that all studied nurses had unsatisfactory practice score. This is due to that the studied nurses their age ranged from 20 – 30 years and all had nursing diploma degree as well as less than half of them were newly graduated .

Saleh, (2008) found that there is no significant statistical relation between nurse's practice and years of experience. This goes in line with the current study which showed no relation between nurse's practice and years of experience. This could be explained as senior nurses who have prolonged years of experience took administrative role and delegated the nursing activities to the junior nurses. So, they were far away from the practical field and consequently their mastering skills were decreased or diminished. Accordingly, the unit should be provided with a head nurse for

guidance and feed back and reinforcement as well as punishment.

Conclusions & Recommendations

Based on the results of the present study it could be concluded that nurses' practice regarding care provided for premature neonates varies between satisfactory and unsatisfactory.

Based upon the finding of the present study, the following recommendations can be deduced:

- The ratio of nurses to premature neonates should be 1:2.
- Pre- service training for newly recruited nurses will help to update and improve their practice.
- In service training programs directed toward all aspects of care provided for neonates should be conducted.
- Nurses' practice should be adequately supervised by head nurses and proper feedback should be given.
- Booklets of critical procedures for premature neonates should be available at the unit.
- Phototherapy has an effect in treating all cases of jaundice in neonatal intensive care unit.
- Accordingly, the unit should be provided with a head nurse for guidance and feed back and reinforcement as well as punishment.

Table (1): Characteristics of Studied Nurses

Nurses Characteristics	No=22	%
Age/year		
<20	5	22.7%
20 – 30	9	40.9%
31 – 40	8	36.4%
$X \pm SD$ 25.9 \pm 6.9		
Years of experience/year		
<5	7	31.8%
5 – 10	6	27.3%
>10	9	40.9%
$X \pm SD$ 8.6 \pm 6.93		
Level of education:		
• Diploma in nursing	19	86.4
• Technical institute of nursing	3	13.6
• Bachelor degree in nursing	0.0	0.0
Previous training program about premature care:		
• No	12	54.5
• Yes	10	45.5

Table (2): Routine Nursing Care Provided to Premature Neonate Given by Studied Nurses

Care	No=22	%
Measuring Vital Signs		
Satisfactory	22	100
Unsatisfactory	0.00	0.00
Bottle Feeding		
Satisfactory	22	100
Unsatisfactory	0.00	0.00
Skin Care		
Satisfactory	15	68.2
Unsatisfactory	7	31.8
Eye Care		
Satisfactory	20	90.9
Unsatisfactory	2	9.1
Cord Care		
Satisfactory	21	95.5
Unsatisfactory	1	4.5
Protection from Infection		
Satisfactory	12	54.5
Unsatisfactory	10	45.5
Daily Care of Incubator		
Satisfactory	22	100
Unsatisfactory	0.00	0.00
Assist in Laboratory Test		
Satisfactory	22	100
Unsatisfactory	0.00	0.00
Administration of Medication		
Satisfactory	20	90.9
Unsatisfactory	2	9.1
Keep Quite Environment		
Satisfactory	18	81.8
Unsatisfactory	4	18.2
Maintain Parent-Neonate Bonding		
Satisfactory	5	22.7
Unsatisfactory	17	77.3
Terminal Care of Incubator		
Satisfactory	18	81.8
Unsatisfactory	4	18.2

Table (3): Nursing Care Provided to Premature Neonate with Special Health Problems provided by Studied Nurses.

Care	No=22	%
Neonates with Thermoregulation Disorders:		
Satisfactory	21	95.9
Unsatisfactory	1	4.5
Neonates with Respiratory Distress Disorders:		
Satisfactory	18	81.8
Unsatisfactory	4	18.4
Neonates during Gavage Feeding		
Satisfactory	22	100
Unsatisfactory	0.00	0.00
Neonates during Phototherapy		
Satisfactory	22	100
Unsatisfactory	0.00	0.00

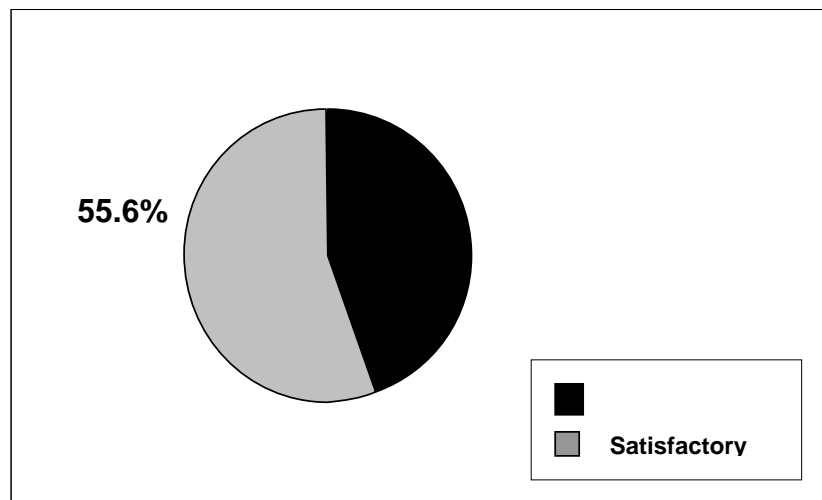
**Figure (1): Total Nurses' practice score.**

Table (4): Relation between Nurses' Practice Score and their Age

Practice score (206)	Age				X ²	P
	Age <25		Age >25			
<60% unsatisfactory	4	33.3%	-	-	4.074	0.044*
>60% satisfactory	8	66.7%	10	100%		
* Statistical significant (P<0.05)						

* Statistical significant ($P < 0.05$)

Table (5): Relation between Nurses' Practice Score and their Educational Level

Practice score (206)	Educational level				X ²	P
	Diploma		Technical institute of nursing			
<60% unsatisfactory	3	15.8%	1	33.3%	0.536	0.464
>60% satisfactory	16	84.2%	2	66.7%		

Table (6): Relation between Nurses' Practice Score and their years of experience

Practice score (206)	Years of experience				X ²	P
	<10		>10			
<60% unsatisfactory	3	23.1%	1	11.1%	0.512	0.464
>60% satisfactory	10	76.9%	8	88.9%		

References:

- **Abd El- Lateef A.M. (2003):** Designing, Implementation and Evaluating Educational Program for Prevention of Infection in Burn Unit, Unpublished Doctoral Thesis. Faculty of Nursing, Zagazig University. PP: 69-70, 72-76.
- **Attia FA. (2001):** A study of the Effect of Teaching Program on Prevention of Nosocomial Infection in Peritoneal Dialysis Unit at Zagazig University Hospitals Unpublished Doctoral Thesis. Faculty of Nursing, Zagazig University. PP: 149-151, 154-159.
- **Black Burn D. (2003):** Maternal – Fetal – Neonatal physiology: A clinical perspective, 2nd ed. W.B Sanders company, Philadelphia, P: 78.
- **Brown G. (2009):** NICU Noise and Preterm Infant. Available at: http://www.medscape.com/viewarticle/703394_2 retrieved at: April 2008
- **Burroughs A. & Leifer G. (2001):** Maternity nursing an introductory text. 8th ed. W.B Sanders Company, Philadelphia, P: 527.
- **Gad Allah HM. (2007):** Assessment of Nurses' Performance in Premature Units at Zagazig University Hospitals. Unpublished Master Thesis. Faculty of Nursing, Zagazig University.p.p.90-100.
- **Hatfield NT. (2007):** Broadribb's Introductory Pediatric Nursing. 7th ed. Lippincott Williams and Wilkins Company, Philadelphia, P: 237.
- **Hussien AM. (2002):** Education Training Program for Nurses Dealing with Low Birth Weight Infant at Zagazig University Hospitals and General Hospital. Unpublished Doctoral Thesis. Faculty of Nursing, Zagazig University. P: 90.
- **Kopelman AE. (2009):** Hyperbilirubinemia. Available at <http://www.merck.com/mmhe/sec23/ch264/ch2649.html>.
- **Nettina SA. (2005):** Lippincott Manual of Nursing Practice. Handbook. 3rd ed. Lippincott Williams and Wilkins Company, Philadelphia, PP: 1065-1068.
- **Pezzati M., Biagioli EC., Martelli E., Gambr B., Biagiotti R. & Rubaltelli FF. (2002):** Umbilical Cord Care: The Effect of Eight Cord Care Regimens on Cord Biology of Neonate, 81, 38-44 Health nodule.
- **Pilliteri A. (2003):** Maternal and Child Health Nursing: Care of the Child Bearing & Child Rearing Family. 4th ed. Lippincott Williams and Wilkins Company, Philadelphia, PP: 718-764.
- **Parente S. & Lowreiro R. (2001):** Quality improvement in ICU. ICU noise pollution. J Anaesthesiol; 18(5): 385-392.
- **Potter M. (2008):** Pregnancy & Premature Baby Care. Available at: <http://www.foundstone.com/index.htm?subnav=services/navigation.htm&subcontent=/services/founds>, Claifornia, San Francisco. SANS institute, InfoSec Reading Room.
- **Saleh MS. (2008):** Nurses Compliance to Standards of Nursing Care in Performing Invasive Procedures at Zagazig University Hospitals. Unpublished Master Thesis. Faculty of Nursing, Zagazig University.p.p.100-105

- **Soliman WM. (2005):** Assessment of Intensive Care Unit Nurse's Practice and Practice of Infection Control Precautions. Unpublished Master Thesis. Faculty of Nursing. Zagazig University. PP: 89, 93-100

Tantawy NM. (2000): Nurses Practice and Practice Related to Infection Control in Operating Room at Zagazig Emergency University Hospital. Unpublished Master Thesis. Faculty of Nursing. Zagazig University. PP: 77-85
- **Wong D., Hockenberry MJ. & Wilson D. (2007):** Nursing Care Of Infants and Children. 7th ed. Mosby Co, St Louis, P: 230.
- **Zapata E. (2007):** NCP the Preterm Infant. Available at: <http://nursingcareplan.blogspot.com/2007/01/ncp-preterm-infant.html> retrieved at: April 2008