Shandi University

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Faculty of Nursing Science

Assessment Of Nurse's Knowledge and Practice Regarding Care of Neonate With Respiratory Distress Syndrome In soba University Hospital

A thesis Submitted In Partial Fulfillment for Requirement of Master Degree in pediatric nursing

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الآية

قال تعالي :

(يَا أَيُّهَا النَّاسُ إِن كُنتُمْ فِي رَيْبٍ مِّنَ الْبَعْثِ فَإِنَّا خَلَقْنَاكُم مِّن تُرَابٍ ثُمَّ مِن نُّطْفَةٍ ثُمَّ مِنْ عَلَقَةٍ ثُمَّ مِن مُّضْغَةٍ مُّخَلَّقَةٍ وَغَيْرِ مُخَلَّقَةٍ لِّنُبَيِّنَ لَكُمْ وَنُقِرُّ فِي الْأَرْحَامِ مَا نَشَاءِ إِلَى أَجَلٍ مُّسَمًّى ثُمَّ نُخْرِجُكُمْ طِفْلًا ثُمَّ لِتَبْلُغُوا أَشُدَّكُمْ وَمِنكُم مَّن يُتَوَفَّى وَمِنكُم مَّن يُرَدُّ إِلَى أَرْذَلِ الْعُمُرِ لِكَيْلَا يَعْلَمَ مِن بَعْدِ عِلْمٍ شَيْئًا وَتَرَى الْأَرْضَ هَامِدَةً فَإِذَا أَنزَلْنَا عَلَيْهَا الْمَاءِ اهْتَزَّتْ وَرَبَتْ وَأَنبَتَتْ مِن كُلِّ زَوْجٍ بَهِيجٍ)

صدق الله العظيم

سورة الحج الآية (5)

Dedication

- The candle that burns for the light my way
  - ,,,,,,,,,,,,,,,,, My beloved father,,,,,,,,,,,,,
- The one that without her I will not be here
  - ,,,,,,,,,,,,,,,,, My mother ,,,,,,,,,,,,,,,,,,,,,,
- To the sweet flavor of my life, to those who I cannot

  Imagine my life without them……..……..

  - ,,,,,,,,,,,,,,,, My sister, brothers and my husband,,,

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Abstract

Respiratory distress syndrome (RDS) is a respiratory disorder that is specific to neonates it result from immature lung and a deficiency in surfactant, This descriptive study design was aimed to assess nurses' knowledge and practice regarding care of neonate with respiratory distress syndrome in neonatal intensive care unit (NICU) in soba university hospital. The Sample of the study was50 nurses who were available during study period, the data was collected by questionnaire and check list and analyzed by SPSS program, the study showed that majority of nurses (70%) had bachelor degree and (64%) of them had no training course in NICU, more than half of study group (70%) had poor knowledge about ABG of neonate with RDS, (68%) had poor knowledge about RDS confirmation, (58%) of nurses had faire knowledge about management of RDS and (36%) had good knowledge and (42%) had faire knowledge about nursing action for neonate with RDS. The research reached into results which show that many nurses had poor knowledge and practice regarding care of neonate with RDS so the study recommends that continuous education and training programs is very important for nurses.

ملخص البحث

متلازمة عوز التنفس :هي اضطراب في الجهاز التنفسي للاطفال حديثي الولاده ينتج عن الرئة غير الناضجة ونقص في ماده نمو الرئه، تهدف هذه الدراسه الوصفيه إلى تقييم معرفة وممارسة الممرضين فيما يتعلق برعاية حديثي الولاده المصابين بمتلازمة عوز التنفس في وحدة الرعاية المكثفه لحديثي الولادة في مستشفى سوبا الجامعي. بلغت عينة الدراسة 50 ممرضة، وتم جمع البيانات عن طريق الاستبيان وقائمة الفحص وتحليلها بواسطة برنامج SPSS ، وأظهرت الدراسة أن غالبية الممرضات (70٪) حصلن على درجة البكالوريوس، (64٪) منهن لم يكن لديه دورة تدريبية في وحدة الرعاية المكثفه لحديثي الولادة ، أكثر من نصف مجموعة الدراسة (70 ٪) كان لديهم معرفة ضعيفة حول فحص غازات الدم الشرياني للاطفال المصابين بمتلازمه عوز التنفس ،(68 ٪) لديهم معرفة ضعيفة عن كيفيه التشخيص ، (58 ٪) من الممرضات كان لديهم معرفة مناسبه عن كيفيه علاج المتلازمه، (36 ٪) لديهم معرفة جيدة و (42 ٪) لديهم معرفة مناسبه بالعنايه التمريضيه للاطفال المصابين ،وقد توصل البحث إلى نتائج تبين أن العديد من الممرضات يعانين من ضعف المعرفة والممارسة فيما يتعلق برعاية حديثي الولاده المصابين بمتلازمة عوز التنفس ، لذا توصي الدراسة بأن التعليم المستمر وبرامج التدريب مهمة للغاية بالنسبة للممرضات.

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Abbreviations

RDS	Respiratory distress syndrome
SDLD	surfactant deficiency lung disease
NICU	neonatal intensive care unit
ABG	Arterial blood gases
HMD	hyaline membrane disease
MAS	meconium aspiration syndrome
TTNB	transient Tachypnea of newborn
PPHN	persistent pulmonary hypertension
CDH	congenital diaphragmatic hernia
PG	Phosphatidylglycerol
L/S	Lecithin/sphingomyelin ratio
IPPV	intermittent positive pressure ventilation
IVH	intraventricular hemorrhage
NEC	necrotizing enterocolitis
SPSS	Statistical package for social science
CPAP	Continuous positive airway pressure
ETT	endotracheal tube

Chapter one

Chapter one

Introduction

Respiratory distress syndrome (RDS) is a respiratory disorder that is specific to neonates. It results from lung immaturity and a deficiency in surfactant. [1]

RDS is also known as: hyaline membrane disease, infant respiratory distress syndrome, newborn respiratory distress syndrome and surfactant deficiency lung disease (SDLD) [2]

In the united state, has been estimated to occur in 20,000-30,000 newborn infant each year and is a complication in about 1% pregnancies. Approximately 50% of the neonates born at 26-28 weeks gestation develop RDS, whereas less than 30% of premature neonates born at 30-31 weeks gestation develop the condition.[3]

In India incidence appear to be 1% among live birth, rising to about 8% among preterm infants. [4]

RDS is encountered less frequently in developing countries than elsewhere, primarily because most premature infants who are small for their gestation are stressed in utero because of malnutrition or pregnancy-induced hypertension. In addition, because most deliveries in developing countries occur at home, accurate records in these region are unavailable to determine the frequency of RDS.[3]

The risk for development of RDS increases with maternal diabetes, multiple births, cesarean delivery, precipitous delivery, asphyxia, cold stress, and maternal history of previously affected infants. The incidence is highest in preterm male or white infants. The risk of RDS is reduced in pregnancies with chronic or pregnancy –

associated hypertension, maternal heroin use, prolonged rupture of membranes, and antenatal corticosteroid prophylaxis. [5]

Objectives:

General objective:

Assessment of nurse's knowledge and practice regarding caring of neonate with respiratory distress syndrome.

Specific objectives:

- To assess the knowledge of the nurses about RDS.
- To identify nursing performance regarding caring of neonate with RDS.
- To determine the preventive measures used to prevent complications of RDS

Justification:

Respiratory distress syndrome is the commonest cause of respiratory distress in the newborn, particularly, in preterm infants; it carries a high mortality rate among those infants. There is wide variety of complications in which the neonates with respiratory distress syndrome pass through due to lack of sufficient nursing care, in order to improve this nursing research should be conducted to identify problems and improve nurses' knowledge and practice.

Chapter two

Chapter two

Literature Review

Respiratory distress syndrome (RDS) in neonates is a common emergency life threatening condition. [7]It results from lung immaturity and a deficiency in surfactant, so it is seen most often in premature infants. [1] also known as hyaline Membrane disease, The risk of RDS is higher the lower the gestational age, [6] other infants who might experience RDS include infants of diabetic mothers, those delivered via cesarean section, those experiencing perinatal asphyxia, [1] multifetal pregnancies, precipitous deliveries, cold stress, and a history of previously affected infants[7] It is believed that each of these conditions has an impact on surfactant production, thus resulting in RDS in the term infant. [1]

Common causes:

Pulmonary causes:

respiratory distress syndrome (RDS) or hyaline membrane disease (HMD) due to surfactant deficiency, meconium aspiration syndrome (MAS), transient Tachypnea of newborn (TTNB), persistent pulmonary hypertension (PPHN), Pneumonia, milk aspiration, pneumothorax, pleural effusion and congenital malformations like tracheosophageal fistula with esophageal atresia(TEF with EA), congenital diaphragmatic hernia(CDH), lobar emphysema, pulmonary hypoplasia and bilateral choanal atresia.

Nonpulmonary causes:

perinatal asphyxia, hypothermia, hypoglycemia, metabolic acidosis, cerebral edema, neurological disorders, congenital heart disease, congestive heart failure, hemorrhage, severe anemia, etc. [7]

Decreased production and secretion of lung surfactant is the main cause of RDS. Surfactant is a surface-active phospholipids secreted by the alveolar epithelium. This substance reduces the surface tension of fluids that line the alveoli and respiratory passages, resulting in uniform expansion and maintenance of lung expansion at low intraalveolar pressure. Immature development of these functions produces consequences that seriously compromise respiratory efficiency. Adequate levels of surfactant are present after 35 weeks of gestation. Deficiency in surfactant leads to unequal inflation of alveoli on inspiration and the collapse of the alveoli on end expiration. The neonate is unable to keep the lungs inflated and exerts extensive effort to re-expand the alveoli on each breath due to surfactant deficiency. This leads to atelectasis, increased pulmonary vascular resistance, hypo perfusion to the lung tissue, and consequently, hypoxemia, and hypercapnia. These series of events causes hypoventilation with increased PaCO2, decreased PaO2, and decreased pH. The combination of hypercapnia, hypoxia, and acidosis produces pulmonary arterial vasoconstriction, resulting in further alveolar hypoperfusion, impaired cellular metabolism, and consequently diminished production of surfactant. This vicious cycle continues unless prompt treatment is initiated. [8]

Pathophysiology:

The lack of surfactant in the affected newborn's lungs results in stiff, poorly compliant lungs with poor gas exchange. Right-to-left shunting and

hypoxemia result. As the disease progresses, fluid and fibrin leak from the pulmonary capillaries, causing a hyaline membrane to form in the bronchioles, alveolar ducts, and alveoli. Presence of the membrane further decreases gas exchange. [9]

Factors that increase the incidence of respiratory distress syndrome:

- Gestational age: 80 percent of babies up to 28 weeks' gestation, 50 percent up to 32 weeks and below 3 percent from 33 weeks to term will develop the
- disease.
- Infants of diabetic mothers are usually term babies but are sometimes preterm, often as a result of a poorly controlled diabetic pregnancy. The baby is macrocosmic to different degrees and often large for its gestational age. The type II pneumocytes that produce surfactant are adversely affected by the metabolic alterations caused by hyperglycemia and hyperinsulinism and although the fetus may be mature by chronological gestation, from a physiological development perspective they tend to respond in a more immature way.
- Black babies have a lower incidence and severity than white babies, matched for age and birth weight.
- Girls have a lower risk, less severe disease and a lower mortality rate than boys.
- In a multiple pregnancy the second twin is more likely to be affected if there is a delay.
- Delivery by caesarean section prior to spontaneous onset of labour increases the risk.
- Asphyxia, acidosis and hypothermia all inhibit surfactant production and its regeneration.

- Familial predisposition: some women are not able to take a pregnancy beyond a certain gestation with a recurring incidence of respiratory distress syndrome. [10]

Factors that decrease the incidence of respiratory distress syndrome:

- Stress in utero: risk is lower in disorders associated with placental dysfunction that leads to intrauterine growth restriction, but not pre eclampsia.
- Maternal narcotic addiction, alcohol ingestion, smoking. These factors create chronic stress and enhance the production of fetal endogenous corticosteroids and early maturation of surfactant. However, the baby may have symmetrical growth restriction and be small for its gestational age. [10]

How does surfactant work? Pulmonary surfactant

Is a substance that is composed of 90% phospholipids and 10% proteins, It is produced by type II alveolar cells within the lungs, The alveolar cells begin to produce pulmonary surfactant around 24 to 28 weeks and continue to term. [11] Its function is to act as a detergent to lower the tension created when two elements come together, in this case, fluid and air. When the baby takes its first breath, lung fluid drains from each alveolus and air enters. The molecules of air and remnants of the fluid come together and create a platform known as the air–fluid interface. In the outside world this platform, or surface tension, supports floating, for example, leaves and ducks float on the surface of the water. Surfactant acts to break up the surface tension into smaller molecules so that the alveoli, once inflated, will remain so on expiration. Once the alveoli are partly inflated their resistance is lower. When blowing up a party balloon the initial pressures used to ‘get it going’ are considerable, but once it is half inflated it becomes easier because the balloon

walls are thinner and the radius is bigger, according to the Laplace equation. In the presence of surfactant, both large and small alveoli are able to inflate on inspiration. In a baby with little or no surfactant, both large and, to a lesser degree, small alveoli inflate on inspiration, but on expiration the surface tension acts as an opposing force and the small alveoli collapse. Each following breath brings about some inflation, but eventually the baby tires and over time all the alveoli collapse back to their original state [10]

Tests used to evaluate fetal lung maturity are:

- **Phosphatidylglycerol (PG):**

PG is synthesized from mature lung alveolar cells. It is present in the amniotic fluid within 2 to 6 weeks of full-term gestation. The presence of PG indicates lung maturity and a decreased risk of respiratory distress syndrome.

- **Lecithin/sphingomyelin (L/S) ratio:**

Lecithin and sphingomyelin are two phospholipids that are detected in the amniotic fluid. The ratio between the two phospholipids provides information on the level of surfactant.

AL/S ratio is greater than 2:1 in a non diabetic woman, indicating the fetus's lungs are mature.

AL/S ratio of 3:1 in a diabetic woman indicates the fetus's lungs are mature. [11]

Signs of respiratory distress syndrome:

The symptoms are apparent within a few minutes after birth although in larger premature neonates, the onset of symptoms may occur several hours later. Rapid, shallow, respiration, Tachypnea, audible grunting, intercostal and subcostal

retractions, nasal flaring, and cyanosis are accompanying symptoms. As the condition worsens, flaccidity and apnea occurs. Respiratory failure may occur with the rapid progression of the disease. [8]

Tachypnoea

This is a respiratory rate when breaths are over 60 per minute. The normal range for a term baby is 30–40 breaths per minute. Preterm babies breathe more quickly compared to term babies. The lower the gestational age, the higher is the metabolic rate. Hypercapnoea, a raised partial pressure of carbon dioxide in the blood (PCO2), and hypoxaemia, a low partial pressure of oxygen (PO2) in the blood, lead to stimulation of the medulla oblongata which results in a raised respiratory drive and rate. Over time, tachypnoea is self-limiting as its presence will over-utilize energy resources, one of which is oxygen. [10]

Tachycardia

This is a raised heart rate. A term baby's heart rate will tend to be around 110–140 beats per minute (bpm). Preterm babies have faster heart rates: 140–160 bpm. Tachycardia is a relative term according to gestational age and gives a comparison with what the baby's heart beat is normally, if known. A heart beat over 200 bpm is unacceptably high and constitutes an arrhythmia. The rise in rate is a result of hypoxia (low oxygen level in the extracellular spaces of the tissues) as the heart attempts to circulate the available oxygen to the tissues. [10]

Central cyanosis

This is caused by more severe hypoxia. In all babies, whatever the ethnicity, the tongue and the mucous membranes in the mouth should be immediately inspected to ascertain the level of perfusion to those tissues which will reflect how

pink or blue they are. The skin is the most obvious place to make an assessment, but can prove difficult in estimating to what degree the baby is cyanosed, Blue hands and feet (acrocyanosis) can be found in well newborn babies where the tongue and mucous membranes of the mouth are pink and the oxygen saturations normal. It is far easier to place a pulse oximeter onto the baby's left hand or foot to get oxygen saturations, which measure the percentage of oxygen saturation of hemoglobin. The normal level should be 95–100 percent. [10]

Expiratory grunt

Neonates have the ability, when hypoxic, to raise their oxygen levels by trapping the oxygen that is contained in expiratory air and preserve some internal lung pressure to prevent the airways from collapsing at the end of each breath. As the air reaches the larynx the glottis contracts, which forces the air to do a U-turn over the vocal cords, to return to the trachea and alveoli. This action enables the alveoli to strip the oxygen from the expiratory air, so enhancing oxygenation of the blood, and the back pressure prevents the alveoli from collapsing, thus facilitating gaseous exchange. Each baby will have an individual tone of grunt. It does not sound like a pig grunt, but a noise on every breath. It is a significant sign as it could also indicate that the baby is cooling and that the respiratory distress is part of a changing metabolism as the baby attempts to raise the metabolic rate in order to raise temperature. [10]

Recession

In normal inspiration, a negative pressure is created by the dome-shaped diaphragm which contracts, moves down and flattens out. In effect the height of the thoracic cavity increases. Contraction of the external intercostals muscles results in an elevation of the rib cage and a thrusting forward of the sternum, which

expands the thorax both laterally and in the anteroposterior plane. Thus a negative pressure is created which draws atmospheric air into the alveoli. Recession is an abnormal in-drawing of the ribs and sternum in the presence of a strong respiratory drive from the medulla oblongata. The lower the gestational age, the softer and more pliable are the cartilages. Recession works against the physiology of respiration because as the ribs are drawn in, so a smaller space is created and a lower negative pressure achieved. The type of recession is named in accordance with the affected anatomical landmarks of the baby. Recession of the ribs is called costal recession; of the spaces between the ribs, intercostal recession; and drawing in of the space immediately below the ribs is called subcostal recession. The sternum can also be affected and this is called sternal and substernal recession. Sometimes the breathing has a 'see-saw' pattern as the abdominal movements and the diaphragm work out of unison. (10)

Apnoea

Apnoea is the cessation of breathing for 20 seconds or more and can spontaneously occur in babies that have a respiratory distress. Apnoea in a baby with respiratory distress is an ominous sign and immediate medical assessment and intervention is needed. In a term baby it occurs as the end result of increasing respiratory fatigue. When the level of carbon dioxide rises, a small increase will stimulate the medulla oblongata, but a large amount will depress it. Sometimes the baby will self-stimulate; for others, especially if their condition is generally deteriorating, they will need to be stimulated to breathe by a gentle touch from the midwife. Preterm babies are more prone to apnea because their more immature medulla oblongata is less responsive to rising levels of carbon dioxide. If the baby fails to reestablish respiration, intermittent positive pressure ventilation (IPPV) by

face mask will have to be given to help the baby take in more oxygen and blow off the excess carbon dioxide. [10]

Nasal flaring

This is an attempt to minimize the effect of the airway's resistance by maximizing the diameter of the upper airways. [10]

Diagnosis of respiratory distress syndrome:

Diagnosis of RDS is based on the signs and symptoms of this condition [8] also can be diagnosed by:

A. Chest radiograph

An anteroposterior chest radiograph should be obtained for all infants with respiratory distress of any duration. The typical radiographic finding of RDS is a uniform reticulogranular pattern, referred to as a ground glass appearance, accompanied by peripheral air bronchograms. [12]

B. Laboratory studies

1. **Blood gas sampling**:

Essential in the management of RDS. Usually, intermittent arterial sampling is performed. Although there is no consensus, most neonatologists agree that arterial oxygen tensions of50–70 mm Hg and arterial carbon dioxide tensions of 45–60 mm Hg are acceptable. Most would maintain the pH at or above 7.25 and the arterial oxygen saturation at 85–93%. In addition, continuous transcutaneous oxygen and carbon dioxide monitors or oxygen saturation monitors, or both, are proving valuable in the minute-to-minute monitoring of these infants.

2. **Sepsis workup:**

A partial sepsis workup, including complete blood cell count and blood culture, should be considered for each infant with a diagnosis of RDS because early-onset sepsis (e.g., infection with group B Streptococcus) can be indistinguishable from RDS on clinical grounds alone.

3. **Serum glucose levels:**

May be high or low initially and must be monitored closely to assess the adequacy of dextrose infusion. Hypoglycemia alone can lead to tachypnea and respiratory distress.

4. **Serum electrolyte levels and calcium:**

Should be monitored every 12–24 hours for management of parenteral fluids. Hypoca attribute to more respiratory symptoms and is common in sick, nonfed, preterm, or asphyxiated infants.

C. **Echocardiography**

A valuable diagnostic tool in the evaluation of an infant with hypoxemia and respiratory distress. It is used to confirm the diagnosis of PDA as well as to document response to therapy. Significant congenital heart disease can be excluded by this technique as well. [(12)]

Management of respiratory distress syndrome:

A. Prevention

1. Antenatal corticosteroids:

Treatment with antenatal corticosteroids is associated with an overall reduction in neonatal death, RDS, intraventricular hemorrhage (IVH), necrotizing enterocolitis (NEC), respiratory support, intensive care admissions, and systemic infections in the first 48 hours of life. A single course of antenatal steroids is recommended between 24 and 34 weeks of gestation to all women at risk of preterm delivery within 7 days. A single course should be administered to women with premature rupture of membranes before 32 weeks of gestation to reduce the risks of RDS, perinatal mortality, and other morbidities. The efficacy of corticosteroid use at 32–33 completed weeks for preterm prelabor rupture of membranes is unclear based on current evidence, but treatment may be beneficial, especially if pulmonary immaturity is documented. Antenatal corticosteroids should be considered for threatened preterm birth at 22–23 weeks of gestation. Antenatal corticosteroid exposure reduced improved survival of extremely preterm infants. Antenatal treatment with corticosteroids at 34–36 weeks of pregnancy has not reduced the risk of respiratory morbidity in neonates. The optimal treatment to delivery interval is >24 and <7 days after the start of steroid treatment. A second course should be considered if the risk from RDS is felt to outweigh the uncertainty about possible long term adverse effects. The recommended glucocorticoid regimen consists of the administration to the mother of two 12-mg doses of betamethasone given intramuscularly 24 hours apart. Dexamethasone is not recommended because of increased risk for cystic periventricular leukomalacia among very premature infants exposed to the drug prenatally.

2. **Preventive measures.**

Several preventive measures may improve the survival of infants at risk for RDS and include antenatal ultrasonography for more accurate assessment of gestational age and fetal well-being, continuous fetal monitoring to document fetal well-being during labor or to signal the need for intervention when fetal distress is discovered, tocolytic agents that prevent and treat preterm labor, and assessment of fetal lung maturity before delivery to prevent iatrogenic prematurity.

B. **Surfactant replacement:**

Now considered a standard of care in the treatment of intubated infants with RDS, Prophylactic surfactant replacement to prevent RDS in infants born at <31 weeks' gestation has reduced the risk of death but may result in some infants being intubated and receiving treatment unnecessarily. A recent consensus statement recommends surfactant prophylaxis (within 15 minutes of birth) to almost all infants <26 weeks' gestation. Prophylaxis should also be administered to all preterm infants with RDS who require delivery-room intubation for stabilization. Early rescue surfactant should be administered to preterm babies with an evidence of RDS. The effect of surfactant therapy is better the earlier in the course of RDS it is given. A second, sometimes a third dose of surfactant should be administered in cases with ongoing evidence of RDS.

Natural (derived from animal lungs) surfactant preparations are better than synthetic (protein-free) at reducing pulmonary air leaks. Natural surfactants are therefore the treatment of choice. Mechanical ventilation can be avoided by using the INSURE (Intubate-Surfactant-Extubate to CPAP [continuous positive airway pressure]) technique when surfactant is administered. Tis has reduced need for mechanical ventilation, Immediate (or early) extubation to noninvasive respiratory

support (CPAP or nasal intermittent positive ventilation) following surfactant administration should be considered in otherwise stabile infants.

C. **Respirator y support**

1. **Endotracheal intubation and mechanical ventilation.**

Mainstays of therapy for infants with RDS in whom apnea or hypoxemia with respiratory acidosis develops. Mechanical ventilation modes include conventional, such as intermittent positive pressure ventilation (IPPV), and high-frequency oscillatory ventilation (HFOV). Ventilators with the capacity to synchronize respiratory effort may generate less inadvertent airway pressure and lessen barotrauma. Ventilator settings should be adjusted frequently to maintain the lowest possible pressures and inspired oxygen concentrations in an attempt to minimize damage to parenchymal tissue. To minimize duration of MV, weaning from MV should be started as soon as satisfactory gas exchange is achieved. Caffeine should be routinely used for very preterm neonates with RDS to augment extubation.

2. **Continuous positive airway pressure (CPAP) and nasal synchronized inter- mittent mandatory ventilation (SIMV).**

Nasal CPAP (NCPAP) or nasopharyngeal CPAP (NPCPAP) can be used early to delay or prevent the need for endotracheal intubation and mechanical ventilation. CPAP treatment is recommended to be started from birth in all infants at risk of RDS, as those born at <30 weeks' gestation. In this way some infants with RDS can be managed without surfactant replacement. By not using surfactant, however, the risk of pneumothorax is increased. Use of NCPAP or NPCPAP on extubation after mechanical ventilation decreases the chance of

reintubation, when at least 5 cm H2O pressure is applied. Short binasal prongs should be used instead of a single prong.

3. **Humidified high flow nasal cannula system.**

This has been introduced to neonatal respiratory care as a way to provide positive distending pressure, even comparable to NCPAP, to a neonate with respiratory distress. It aims to maximize patient tolerance by using heated, humidified gas flow (≥ 1 L/min).

4. **Complications.**

Pulmonary air leaks, such as pneumothorax, pneumomediastinum, pneumopericardium, and pulmonary interstitial emphysema, may occur. Chronic complications include respiratory problems and tracheal stenosis.

D. Fluid and nutritional support.

In the very ill infant, it is possible to maintain nutritional support with parenteral nutrition for an extended period. Full parenteral nutrition and minimal enteral feeding can be initiated on the first day of life. Careful fluid balance should, however, be maintained.

E. **Antibiotic therapy.**

Antibiotics that cover the most common neonatal infections are usually begun initially.

F. **Sedation.**

Commonly used to control ventilation in these sick infants. Morphine, fentanyl, or lorazepam may be used for analgesia as well as sedation, Reported

advantages of treatment include improved ventilator synchrony and pulmonary function. Minimal handling to avoid pain is an important means to decrease need for pain management in ventilated infants Sedation might be indicated for infants who “fight” the ventilator and exhale during the inspiratory cycle of MV. This respiratory pattern may increase the likelihood of complication such as air leak and therefore should be avoided.

Outcome.

Although the survival of infants with RDS has improved greatly, the survival with or without respiratory and neurologic sequelae is highly dependent on birth- weight and gestational age. Major morbidity (BPD/CLD, NEC, and severe IVH) and poor postnatal growth remain high for the smallest infants. [(12)]Nursing Actions:Nursing actions for neonates with RDS are similar to actions for preterm neonates, with additional emphasis on the following:Provide respiratory support.Maintain a patent airway.Assess for correct placement of endotracheal tube if in place.Administer oxygen as ordered.Short-term oxygen administration may be given using a mask or tubing.Long-term oxygen administration may be given using nasal cannula or oxygen hood.Oxygen is humidified and warmed.Administer and monitor continuous positive airway pressure(CPAP), mechanical ventilation, high-frequency oscillatory Ventilation, and/or ECMO as per order.Minimize oxygen demand by maintaining a neutral thermal Environment, clustering care to decrease stress, and treatingAcidosis as clinically indicated and ordered.Suction airway as needed for removal of secretions.Monitor vital signs, oxygen saturation, arterial blood gases, and end CO2 as per orders.Maintain neutral thermal environment to decrease risk of cold Stress.Monitor intake and output.Monitor daily weights. [(11)].

The midwife's role in the labour room

The midwife should assess any predisposing factors to respiratory distress syndrome, especially gestational age, and arrange for the pediatric team to be ready to act. The baby may be electively intubated to give surfactant treatment or as a supportive measure because of extreme prematurity. Often the baby is well in the first few hours and if the pediatric team agree, skin to- skin contact and breastfeeding can be initiated. If below 32 weeks the baby will be placed feet first in a plastic bag which is secured at the neck to reduce evaporative heat losses but parental contact is still possible and should be encouraged by the midwife.The midwife will need to know and understand the plan of care for the baby so that he or she is able to inform and answer any questions the parents may pose. The separation of the baby from the parents should be managed with grace and compassion [(10)].

CHAPTER THREE

CHAPTER THREE

Research Methodology

Study design:

This is descriptive Study design was conducted to assess nurse's knowledge and practices regarding care of neonate with respiratory distress syndrome in neonatal intensive care unit (NICU) at soba university hospital.

Study area and setting:

Soba university hospital initiation on 1975 which is located in Khartoum state near mystoma center, and northern madani street, it is provided many service for population such as medical, surgical, pediatric and obstetrical service, The hospital contain neonatal intensive care unit (NICU) which consist of two rooms, one for premature babies with 3 incubators, 3 resuscitator and 4 CPAP, anther tow for term baby with 1 incubator, 6 resuscitator and 11 Cots.

Study population:

Nurses who work in neonatal intensive care unit (NICU) at soba university hospital.

Sample size:

5o nurse was taken during study period (total coverage).

Sample technique:

Convenient sampling technique was used.

Ethical consideration:

Official letter from Shandi University was taken to manager of soba teaching hospital was taken to. For permission to carry out this research in their hospital, then the goal of research has been explain to responder.

Data collection technique and tools:

Data was collected by questionnaire which, consist of two parts, part one socio-demographic data of nurses, part two about knowledge of nurses about RDS also data was collected by Observational check list consist of nurses practice with neonate with RDS.

Data analysis:

The collected data was analyzed by statistical package for social science SPSS version 11.5 and presented in form of tables and figures.

Scoring system:

Participated who knowledge range from 3 or above was consider good Who is achieving 2 was consider fair and who less than 2 consider poor.

Chapter four

Chapter four

Result

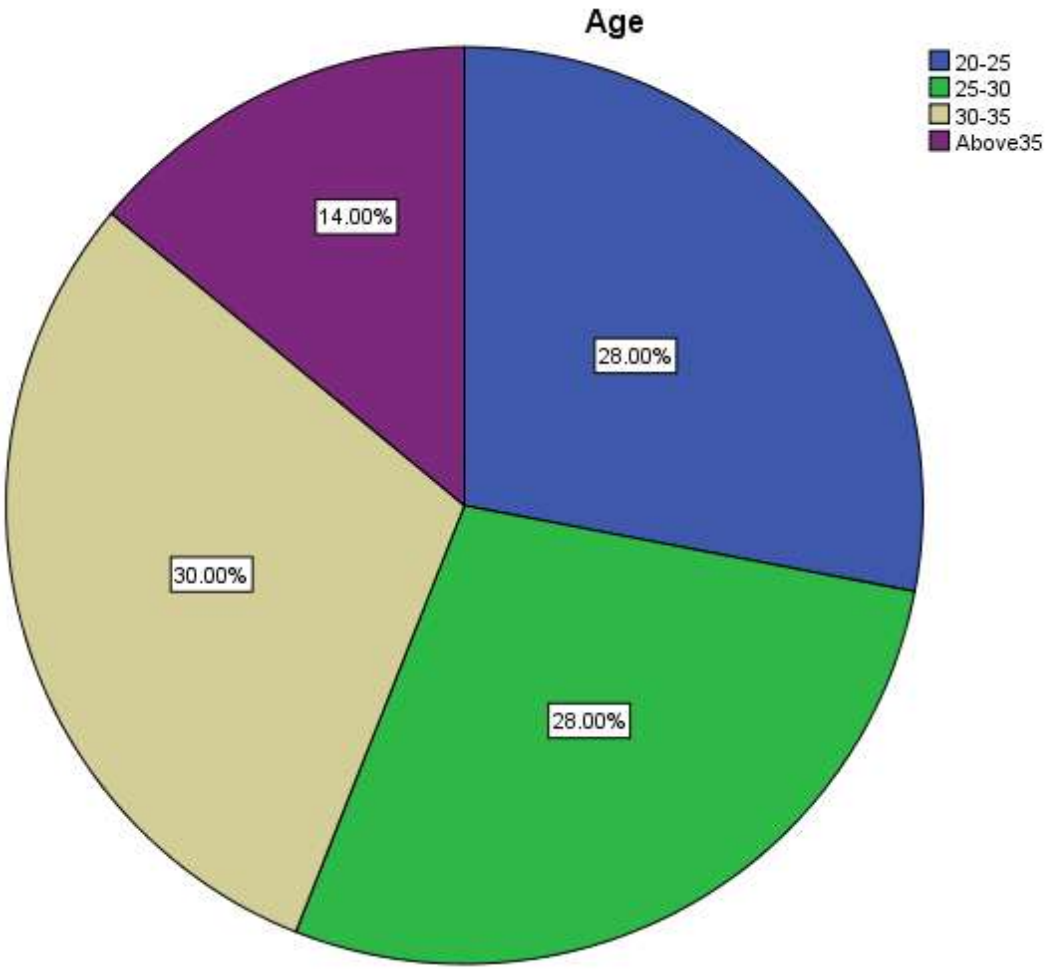

Figure No (1): Showed distribution of study group according to their age by years.

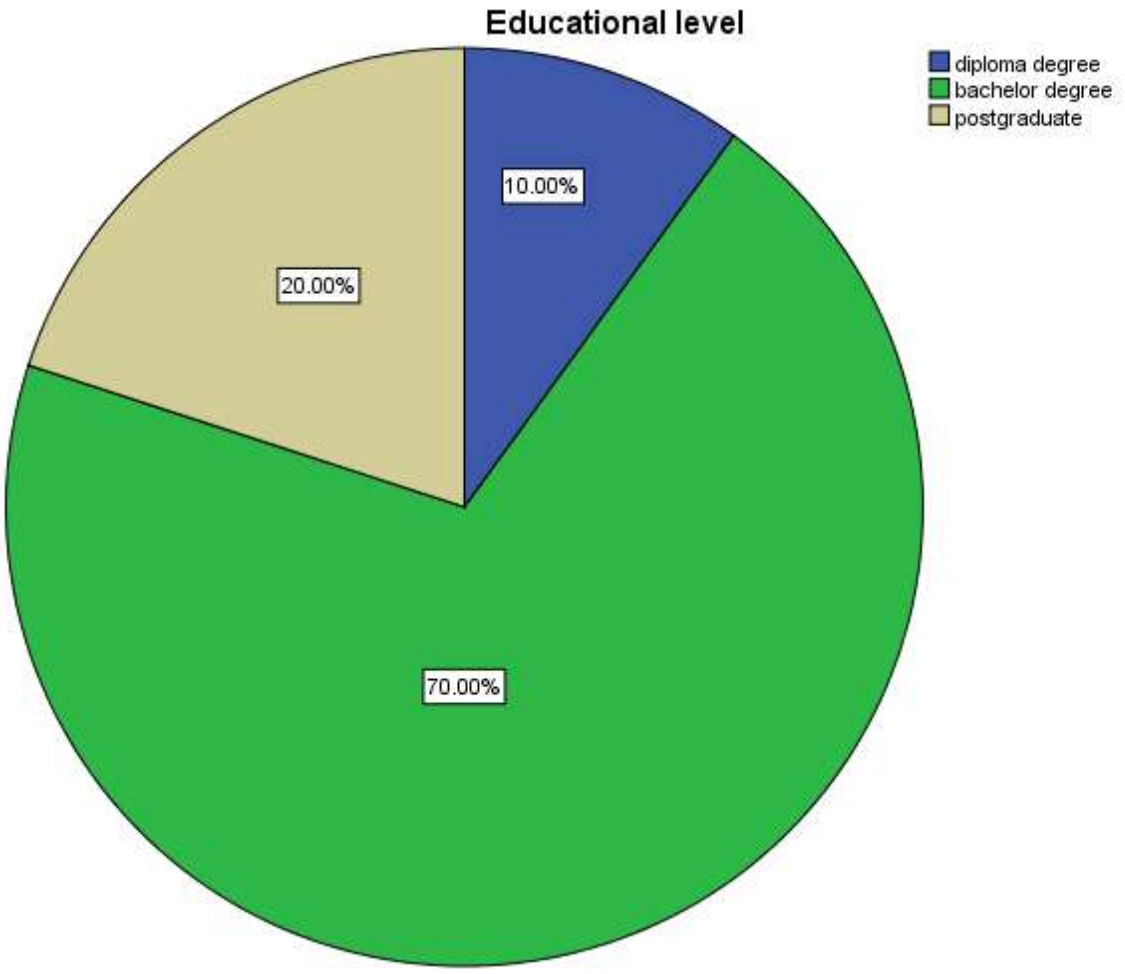

Figure No (2): Showed distribution of nurses according to their educational level.

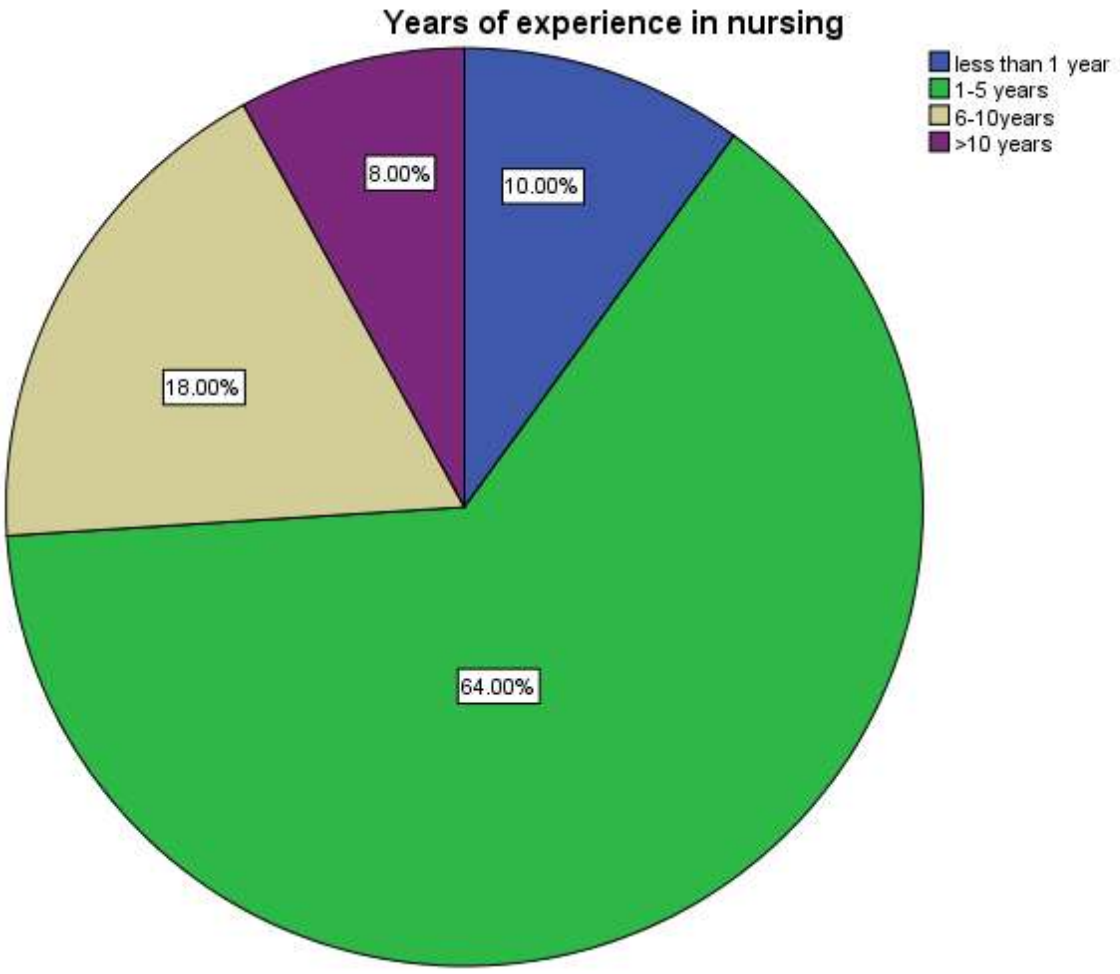

Figure No (3): Showed distribution of study group according to their years of experience in nursing.

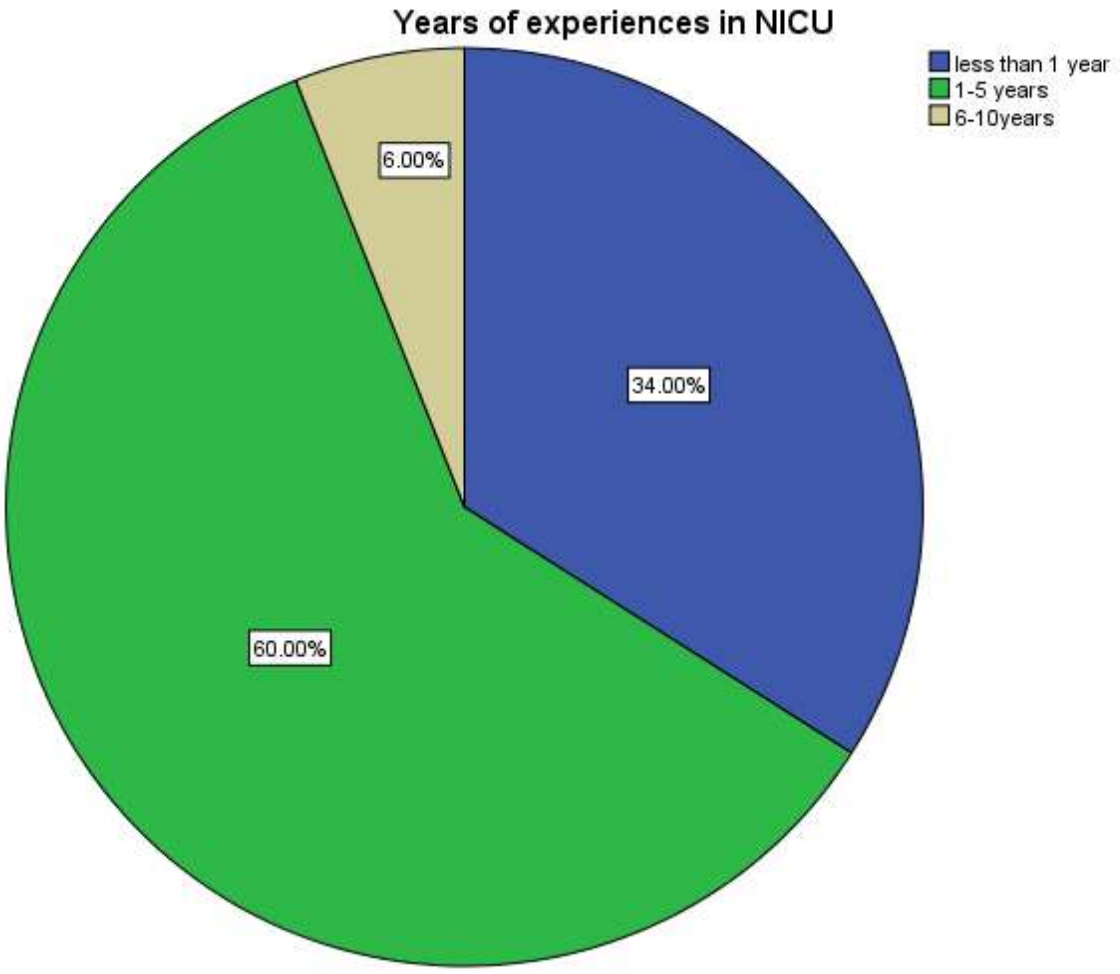

Figure No (4): showed distribution of nurses according to their years of experience in NICU.

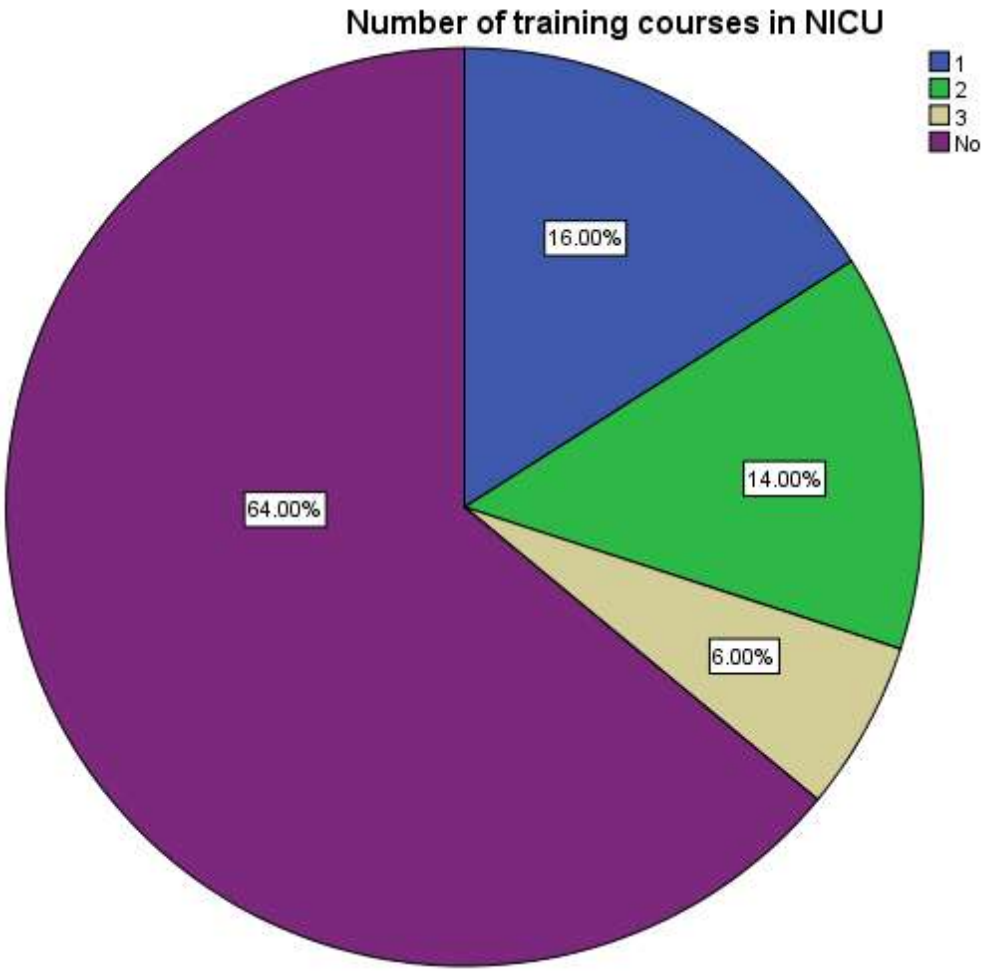

Figure No (5): Showed distribution of study group according to their number of training courses in NICU.

Table No (1): distribution of nurses according to their knowledge about Respiratory distress syndrome:

Items	Frequency	Percent
Poor knowledge	24	48%
Faire knowledge	21	42%
Good knowledge	5	10%
Total	50	100%

Table No (1) showed that 48% had poor knowledge, 42%had faire knowledge and 10% had good knowledge about definition of Respiratory distress syndrome.

Table No (2): distribution of study group's knowledge according to Risk factors for RDS are:

	Frequency	Percent
Poor knowledge	32	64%
Faire knowledge	13	26%
Good knowledge	5	10%
Total	50	100%

Table No (2): showed that 64% had poor knowledge, 26% with faire knowledge and 10% had good knowledge about risk factors for RDS.

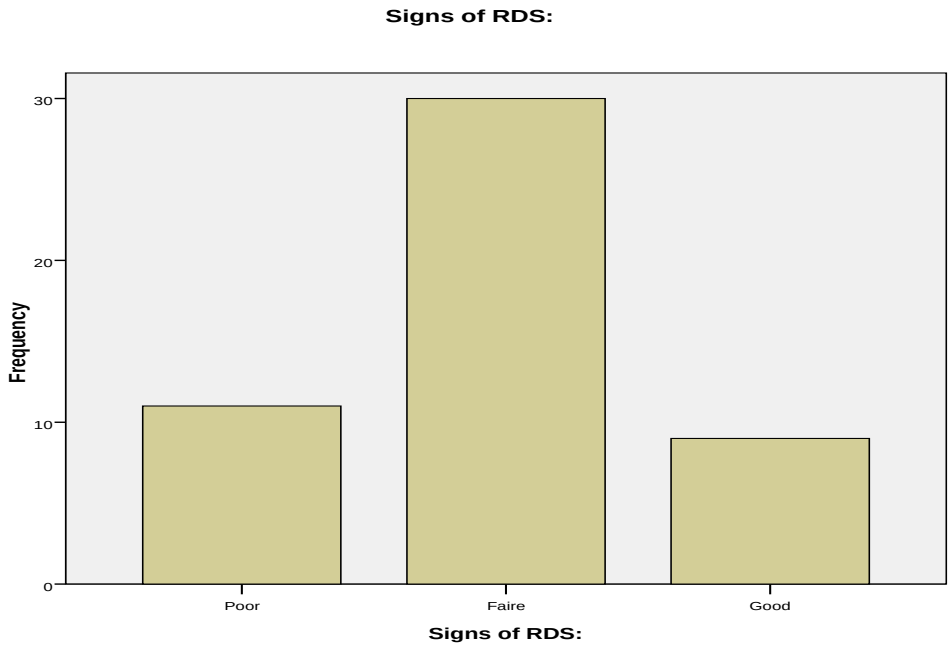

Figure No (6): Showed distribution of study group's knowledge according to Signs of RDS.

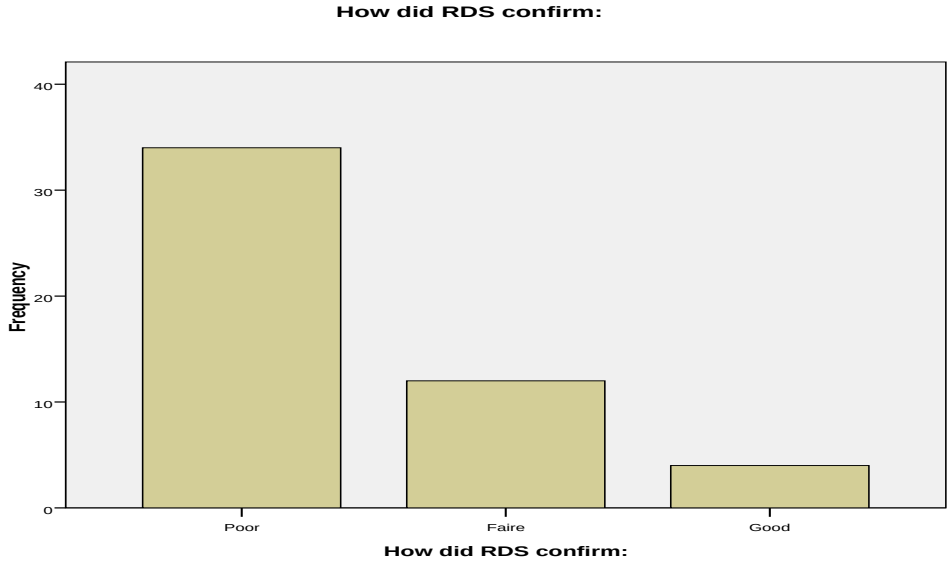

Figure No (7): show distribution of study group's knowledge according to Signs of RDS

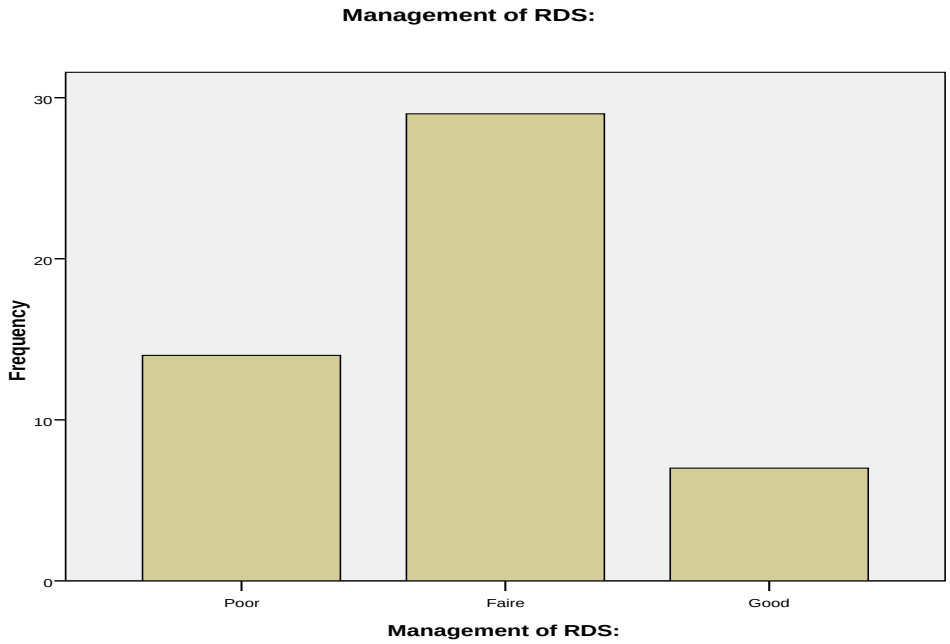

Figure No (8): show distribution of study group's knowledge according to Management of RDS:

Table No (3): distribution of nurse's knowledge according to Neonate on continuous oxygen should be monitored by:

	Frequency	Percent
Poor knowledge	30	60%
Faire knowledge	16	32%
Good knowledge	4	8%
Total	50	100%

Table No (3) showed that 60% had poor knowledge, 32% faire knowledge and 8% had good knowledge about monitoring of Neonate on continuous oxygen.

Table No (4): distribution of nurse's knowledge according to Arterial blood gases for neonate with RDS:

	Frequency	Percent
Poor knowledge	35	70%
Faire knowledge	8	16%
Good knowledge	7	14%
Total	50	100%

Table No (4) showed that 70% had poor knowledge, 16% faire knowledge and 14% had good knowledge about Arterial blood gases for neonate with RDS.

Table No (5): distribution of nurse's knowledge according to Surfactant:

	Frequency	Percent
Poor knowledge	29	58%
Faire knowledge	16	32%
Good knowledge	5	10%
Total	50	100%

Table No (5) showed that 58% had poor knowledge, 32% had faire knowledge and 10% had good knowledge about Surfactant

Table No (6): distribution of nurse's knowledge according to Indications of mechanical ventilation:

	Frequency	Percent
Poor knowledge	32	64
Faire knowledge	14	28
Good knowledge	4	8
Total	50	100

Table No (6) showed 64% had poor knowledge, 28% faire knowledge and 8% had good knowledge about Indications of mechanical ventilation.

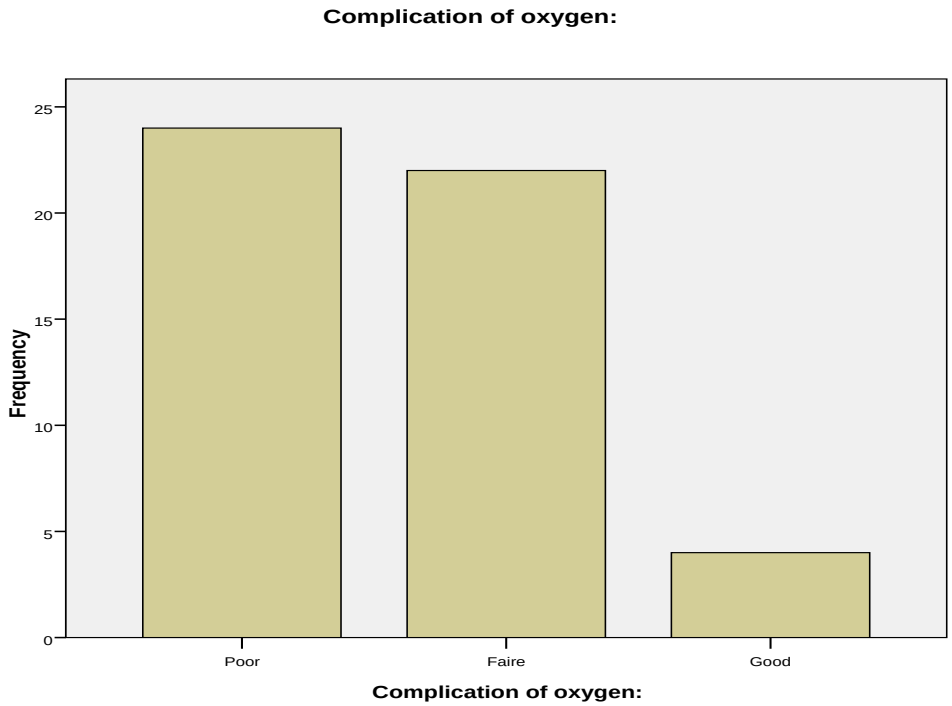

Figure No (9): showed distribution of study group's knowledge according to Complication of oxygen

Table No (7): distribution of respondents' knowledge about Complication of RDS:

	Frequency	Percent
Poor knowledge	30	60%
Faire knowledge	15	30%
Good knowledge	5	10%
Total	50	100%

Table No (7) showed that 60% had poor knowledge, 30% faire knowledge and 10% had good knowledge about Complication of RDS.

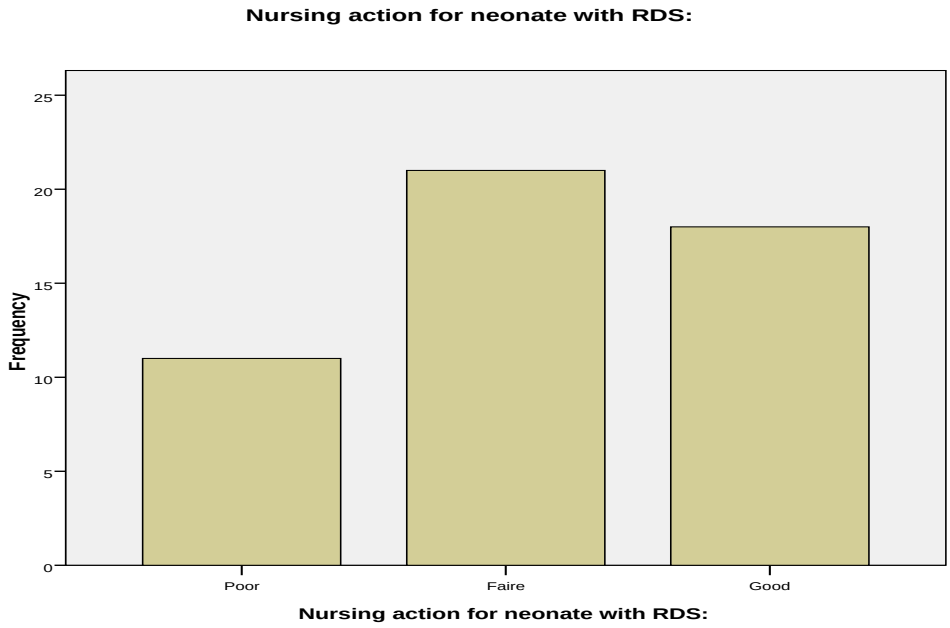

Figure No (10): showed the knowledge of participants about nursing action for neonate with RDS.

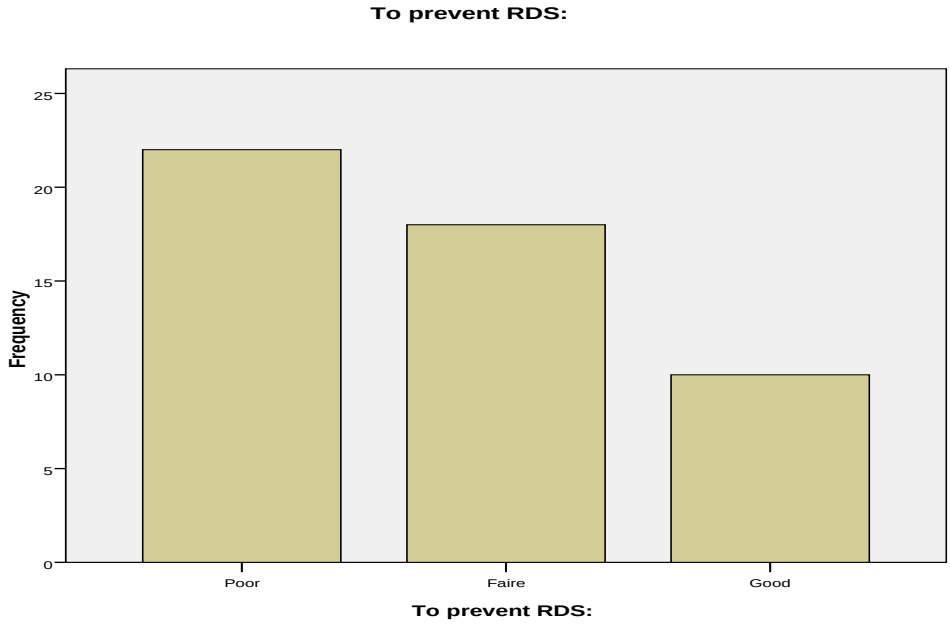

Figure No (11): showed the knowledge of participants about how to prevent RDS.

Cross tabulation tables:

Table No (8) Educational level: * Signs of RDS: Cross tabulation:

Significance value (0.05)

		Signs of RDS:			Total	P value
		Poor	Faire	Good		
Educational level	Diploma degree	5	0	0	5	.000
	Bachelor degree	6	29	0	35	
	Postgraduate	0	1	9	10	
Total		11	30	9	50	

Table No (8) explained that there are strong significant relation (P value.000) between level of Education and knowledge about Signs of RDS.

Table No (9) Educational level: * Management of RDS: Cross tabulation

		Management of RDS:			Total	P value
		Poor	Faire	Good		
Educational level	Diploma degree	5	0	0	5	.000
	Bachelor degree	9	26	0	35	
	Postgraduate	0	3	7	10	
Total		14	29	7	50	

Table No (9) explained that there are strong significant relation (P value.000) between level of Education and knowledge about management of RDS.

Table No (10) Years of experience in NICU * nursing action for neonate with RDS: Cross tabulation

		Nursing action for neonate with RDS:			Total	P value
		Poor	Faire	Good		
Years of experience in NICU	less than 1 year	11	6	0	17	.000
	1-5 years	0	15	15	30	
	6-10 years	0	0	3	3	
Total		11	21	18	50	

Table No (10) explained that there are strong significant relation (P value.000) between Years of experience in NICU and nursing action for neonate with RDS.

Table No (11) Years of experience in NICU * Management of RDS: Cross tabulation

		Management of RDS:			Total	P value
		Poor	Faire	Good		
Years of experience in NICU	less than 1 year	14	3	0	17	.000
	1-5 years	0	26	4	30	
	6-10 years	0	0	3	3	
Total		29	7	50	50	

Table No (11) explained that there are strong significant relation (P value.000) between Years of experience in NICU and management of RDS.

Observational Check list to assess nurse's practice:

Table No (12): Respiratory rate counted in full minute

	Frequency	Percent
Done	22	44.0
Not done	28	56.0
Total	50	100%

Table No (12) show that 56% of nurses don't count Respiratory rate in full minute and 44%do it.

Table No (13) Air way suctioning

	Frequency	Percent
Done	37	74.0
Not done	13	26.0
Total	50	100%

Table No (13) show that 74% of nurses suction air way and 26% do not do it

Table No (14) Pulse oximeter monitoring

	Frequency	Percent
Done	23	46.0
Not done	27	54.0
Total	50	100%

Table (14) show that 54% of nurses do not monitor by pulse oximeter and 46% do it.

Table No (15) Temperature monitoring

	Frequency	Percent
Done	6	12.0
Not done	44	88.0
Total	50	100%

Table No (15) show that 88% of nurses don't monitor temperature and 12% monitor it.

Table No (16) ABG Examination

	Frequency	Percent
Done	14	28.0
Not done	36	72.0
Total	50	100%

Table No (16) show that 72 % of nurses don't do ABG examination and 28% do it.

Table No (17) O2 therapy administration

	Frequency	Percent
Done	38	76.0
Not done	12	24.0
Total	50	100%

Table No (17) show that majority of nurses (76%) administer o_2 therapy and 24% do not do.

Table No (18) Antibiotic therapy administration

	Frequency	Percent
Done	36	72.0
Not done	14	28.0
Total	50	100%

Table No (18) show that majority of study population (72%) administer antibiotic therapy and 28% do not do.

Table No (19) Neonates connection to nasal CPAP

	Frequency	Percent
Done	26	52.0
Not done	24	48.0
Total	50	100%

Table No (19) show that 52% of study population connect neonate to nasal CPAP and 48% do not do it.

Table No (20) Care of neonates on nasal CPAP

	Frequency	Percent
Done	18	36.0
Not done	32	64.0
Total	50	100%

Table No (20) show that 64% of study population do not care with neonate on nasal CPAP and 36% care with them.

Table No (21) Preparation of ventilators and connection of neonates

	Frequency	Percent
Done	21	42.0
Not done	29	58.0
Total	50	100%

Table No (21) show that 58% of nurses do not do Preparation of ventilators and connection of neonates and 42% do it.

Table No (22) Surfactant administration through ETT

	Frequency	Percent
Done	12	24.0
Not done	38	76.0
Total	50	100%

Table No (22) show that majority of nurses (76%) do not administer surfactant through ETT and 24% do it.

Table No (23) Care of neonates on mechanical ventilator

	Frequency	Percent
Done	18	36.0
Not done	32	64.0
Total	50	100%

Table No (23) show that 64% of nurses do not care with neonate on mechanical ventilator and 36% care with them.

Table No (24) Documentation

	Frequency	Percent
Done	38	76.0
Not done	12	24.0
Total	50	100%

Table No (24) show that majority of nurses (76%) do documentation and 24% do not do it.

Discussion

Respiratory distress syndrome (RDS) in neonates is a common emergency life threatening condition; it results from lung immaturity and a deficiency in surfactant. Nurse's knowledge and practice have important role in caring with neonate with RDS.

Based on the result it found that one third (30%) of nurses their age range between (30-35) years, majority of them (70%) had bachelor degree, more than half (64%) their years of experience in nursing range between (1-5) years also two third (60%) their years of experience in NICU between (1-5) years and the majority (64%) had no training course in NICU.

In this study most of nurses had poor knowledge about: the risk factors for RDS (64%), RDS confirmation (68%), monitoring of neonate on continuous oxygen (60%), arterial blood gases for neonate with DRS (70%) most of them only know respiratory acidosis (low PH), indications of mechanical ventilation (64%), complication of RDS (60%).

The result also showed that there is faire knowledge about: signs of RDS (60%), management of RDS (58%), Otherwise there is good nurse's knowledge about nursing action for neonate with RDS.

The study found that there is strong significance relation between level of education and knowledge about signs of RDS (P value equal 0.000), also there is strong significance relation between years of experience in NICU and nursing action for neonate with RDS (p value equal0.000). (significance value equal 0.05)

The researcher observe that most of nurses do not monitor neonate temperature (88%), do not do ABG examination (72%), do not care with neonate on nasal CPAP (64%) majority of nurses (76%) do not administer surfactant through ETT ONLY administered by senior nurse, more than half of nurses (64%) do not care with neonate on mechanical ventilation, do not count respiratory rate in full minute (56%). On the other side majority of nurses (74%) suction airway, 76% administer oxygen therapy, 72% administer antibiotic and 76% of them do documentation.

Chapter five

Chapter five

Conclusion:

Based on the study result, the study showed that nurses had poor knowledge about respiratory distress syndrome as disease affect neonate, and they had good practice regarding care of neonate with RDS.

Recommendations:

The study recommended that:

- Education and training are potential means for implementing effective nursing care at NICU as they alter perception, increase knowledge and in turn change work practice.
- Guideline standards of care must be available in the NICU for nursing staff to help them to improve nursing care.
- The neonatal intensive care unit should be well equipped with advanced technical equipments and facilities to insure ideal nursing management for neonate with RDS.

Recommendation for further researches

Further studies should be conducted to replicate the study on a larger sample of nurses for generalization of results.

Appendix

References

1. Terri Kyle and Susan Carman, essential of pediatric nursing, third edition, 2017
2. www.nhs.uk/conditions/neonatal respiratory distress syndrome
3. SurajGupte, the short textbook of pediatric, 11th edition, 2009
4. Robert M. Kliegman, Bonita F. Stanton, Richard E. Behrman, et al, nelson textbook of pediatrics, 19th edition, 2011
5. N. Jayne klossner, Nancy T. Hatfield, introductory maternity and pediatric nursing, 2nd edition, 2010, page 458
6. Parual datta, pediatric nursing, third edition, 2014
7. Susan L ward and Shelton M hisley, maternal-child nursing care, page 756, 2009.
8. Susan Scott Ricci, Terri Kyle, maternity and pediatric nursing, page 1250, 2009.
9. Hilary Lumsden and Debbie Holmes, Care of newborn by ten teacher, page 126, 2010.
10. Linda Chapman, Roberta F. Durham, maternal- newborn nursing, 2010
11. Tricia lacy Gomella with M. Douglas Cunningham and Fabien G. Eyal, Neonatology. Management. Procedures on-call problems diseases and drugs, 6th Edition, 2009.

بسم الله الرحمن الرحيم

Shandi University

Faculty of Nursing Science

Postgraduate college

Questionnaire About assessment of nurses' knowledge

Regarding care of neonate with respiratory

Distress syndrome

Socio demographic data:

1. Age by years:

A. 20-25 ☐ B. 25-30 ☐

C. 30-35 ☐ D. above 35 ☐

2. Educational level:

A. diploma degree ☐ B.bachelor degree ☐

C. postgraduate ☐

3. Years of experience in nursing:

A. less than 1 year ☐ B.1-5 years ☐

C. 6-10years ☐ D. >10 years ☐

4. Years of experiences in NICU:

A. less than 1 year ☐ B. 1-5years ☐

C.6-10 years ☐ D.>10years ☐

5. Number of training courses in NICU:

A. 1 ☐ B. 2 ☐

C.3 ☐ D.NO ☐

Knowledge:

1. Respiratory distress syndrome is:

A- Life threatening lung disorder ☐

B-It results from underdeveloped and small alveoli ☐

C- It results from insufficient level of pulmonary surfactant ☐

2. Risk factors for RDS are:

A- Infant of diabetic mother ☐

B- Delivery before 37 weeks of gestation ☐

C- Caesarean section deliveries ☐

3. Signs of RDS:

A- Tachypnea ☐

B- Grunting ☐

C- Chest retraction ☐

D- Nasal flaring ☐

4. How did RDS confirm:

A- Clinical ☐

B- Radiological ☐

C- Arterial blood gases ☐

5. Management of RDS:

A- Oxygen administration ☐

B- CPAP ☐

C- Surfactant administration ☐

6. Neonate on continuous oxygen should be monitored by:

A- Pulse oximeter ☐

B- Respiratory rate ☐

C- Vital signs ☐

7. Arterial blood gases for neonate with RDS:

A- Hypoxemia (pao_2) is decreased ☐

B- Hypercapnia ($paco_2$) is increased ☐

C- Respiratory acidosis (low PH) ☐

8. Surfactant:

A- Administered through a catheter in the endotracheal tube ☐

B- Prevent the alveoli from collapsing at the end of expiratory ☐

C- Administered during the first 24 hours of life ☐

9. Indications of mechanical ventilation:

A- CPAP fails to keep spo_2 above 87% ☐

B- Recurrent apnea requiring bag and mask while on CPAP ☐

C- Sever retraction with CPAP ☐

10. Complication of oxygen:

A- Bronchopulmonary dysplasia

B- Retinopathy of prematurity

C-Oxygen toxicity

11. Complication of RDS:

A-Pulmonary edema ☐

B-Pneumothorax ☐

C- Intraventricular hemorrhage

12.Nursing action for neonate with RDS:

A-Maintain patent airway ☐

B-Assess for correct placement of endotracheal tube ☐

C- Suction airway as needed ☐

13.To prevent RDS:

A- Use of antenatal steroid ☐

B- Appropriate resuscitation technique ☐

C-Immediate use of CPAP ☐

بسم الله الرحمن الرحيم

Checklist to assess nurse's practice regarding care of neonate

With respiratory distress syndrome

ITEM	DONE	NOTDONE
1. Respiratory rate counted in full minute		
2. Air way suctioning		
3. Pulse oximeter monitoring		
4. Temperature monitoring		
5. ABG Examination		
6. O_2 therapy administration		
7. Antibiotic therapy administration		
8. Neonates connection to nasal CPAP		
9. Care of neonates on nasal CPAP		
10. Preparation of ventilators and connection of neonates		
11. Surfactant administration through ETT		
12. Care of neonates on mechanical ventilator		
14. Documentation		