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Assessment of Nursing Care Provided for Preterm Neonates Suffering from Respiratory Distress Syndrome in Gaza Governorates

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Assessment of Nursing Care Provided for Preterm Neonates Suffering from Respiratory Distress Syndrome in Gaza Governorates

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Dedication

To my Father, who tirelessly struggled against the hurdles of this world, just to see his son attain the greatest gift of all.

To my world to my mother to whom my life and success.

To my Wife, who kindly, remained by my side, with unending love, being patient, motivation and supporting.

To my brothers for supporting me.

To my kids (Naim & Hanan) for their encouraging smiles.

To my friends

To my colleagues

To all neonates with respiratory distress syndrome with my pray for them to have a good health.

And, to everyone who contributed to make this study a reality,
thank you.

Hani N. I. Awad

Declaration

I certify that this thesis submitted for the degree of Master is the result of my own research, except where otherwise acknowledged, and that this thesis (or any of its parts) has not been submitted for a higher degree to any other university or institution.

Signed: ……

Hani N. I. Awad

Date: 11/1 /2020

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Abstract

Preterm infants are at risk for respiratory distress syndrome, neonatal respiratory distress syndrome (RDS) is a major cause of illness and death for premature infants. RDS or Hyaline Membrane Disease (HMD) is defined as a syndrome caused by developmental insufficiency of surfactant production and structural immaturity in the lungs at birth results in decreased compliance of the lung. Lung maturation is usually inadequate to sustain extra uterine life. The aim of this study was to assess the nursing knowledge and practice provided for preterm neonates with respiratory distress syndrome in the Neonatal Intensive Care Units (NICUs) in Gaza Governorates. Study design: It was a quantitative descriptive analytic cross-sectional study. Subjects and Methods**:** The study was carried out in the NICUs at four hospitals "Al Shifa complex - Al Nassr pediatric hospital - Naser hospital - European Gaza hospital" the sample consisted of all nurses employed in NICUs at the previously mentioned hospitals. The total number of nurses was 110 (census sample), the researcher used a self-administered questionnaire that used to assess the nurses' knowledge and practice regarding nursing care provided to preterm neonates with RDS to collect data from study participants**.** Results: the current study revealed that the mean percentages of knowledge was (76.96%). And the level of practicing care for neonates with RDS was (84%). Conclusion: the current study concluded that there were no statistically significant differences between age, gender, job title and experience of the nurses and their levels of knowledge of care for neonates with RDS. Regarding the hospital, there were statistically no significant differences between hospitals and nurses' level of knowledge, but there were statistically significant differences with level of practice regarding care for neonates with RDS. Recommendations: It was recommended that educational and training programs is needed for improving nurses' knowledge and practice about their care for neonates with RDS in the NICUs.

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List of Abbreviations:

ANA	American Nurses Association
ATII	Alveolar type II
BPD	BronchoPulmonary Dysplasia
CAP	Caffeine for Apnea of Prematurity
C S	Caesarean section
CDC	Centers for Disease Control and Prevention
CNN	Canadian Neonatal Network
CPAP	Continuous Positive Airway Pressure
ECG	Electo Cardio Gram
EGH	European Gaza Hospital
E T	Endotracheal Tube
FiO_2	Fraction Of Inspired Oxygen
GNN	Gaza Neonatal Network
G.S	Gaza Strip
HMD	Hyaline Membrane Disease
KMC	Kangaroo Mother Care
L S	Lecithin Sphingomyelin
LISA	Less Invasive Surfactant Administration
MOH	Ministry of Health
M V	Mechanical Ventilation
NCPAP	Nasal Continuous Positive Airway Pressure
NEC	NecrotisingEnterocolitis
NGO	Non Governmental Organization
NICU	Neonatal Intensive Care Unit
NMC	Nasser medical complex
OCHA	Office for the Coordination of Humanitarian Affairs
PDA	Persistent DuctusArteriosus
PHIC	Palestinian Health Information Center
PCBS	Palestinian Central Bureau of Statistics
PHC	Primary health care
RDS	Respiratory Distress Syndrome
ROP	Retinopathy of prematurity
SPSS	Statistical Package For Social Sciences
TTN	Transient tachypnea of the Newborn
UNRWA	United Nations Relief and Work Agency
USA	United States of America
VLBW	Very Low Birth Weight
WHO	World Health Organization

Chapter One

Introduction

1.1 Background

Preterm birth is the birth occurring before 37 completed weeks of gestation and those neonates susceptible to many health problems including Respiratory Distress Syndrome (RDS) (WHO, 2017).

RDS also known as hyaline membrane disease (HMD), is a life threatening lung disorder that result from under developed and small alveoli and insufficient levels of pulmonary surfactant (Schraufnagel, 2010). RDS is the single most important cause of morbidity in preterm neonates, especially before 34 weeks gestation and is the most common cause of mortality (Dargaville&Tingay, 2012). Acute RDS is a sudden, progressive form of respiratory failure characterized by severe dyspnea, hypoxemia and diffuse bilateral infiltrates. It is a life-threatening lung disorder that commonly affects premature infants (Dorothy et al., 2010).

Factors that increase the risk for neonatal RDS including prematurity, diabetic mother, multiple pregnancy, rapid labor and cesarean delivery that reduce blood flow to the baby, the earlier baby is born, the less developed lungs and the higher chance of neonatal RDS (Joyce et al., 2008).The symptoms of RDS usually appear within minutes after births which includes cyanosis, apnea, decreased urine output, nasal flaring, rapid breathing, shortness of breath and grunting sounds while breathing, unusual breathing movement drawing back of the chest muscles with breathing. Therefore, high-risk and premature infants require prompt attention by a neonatal resuscitation team (Behrman et al., 2007).

RDS is estimated at more than 150,000 cases of RDS worldwide annually. Despite supportive therapy the mortality rate from acute RDS is approximately 50%. It affected 16,268 neonates born alive in the United States. However, 60% -70% mortality rates is reported in children with RDS. Sepsis and multiple organ systems dysfunctions contribute the most to the high mortality and morbidity. Sepsis is not only the most common cause of acute RDS, but infant with acute RDS may be six times more susceptible to infection than infant without acute RDS (Luis et al., 2012).

Nursing care of infant with RDS is demanding alert, skillful, and sensitive nurse. The care involves review the history for risk factors associated with RDS (London et al., 2014). The neonatal mortality rate reflects not only the quality of women care during pregnancy but also the quality of infants care during the first month of life (Pillitteri, 2010). Assessing and improving of nursing care is a major focus of neonatal healthcare (Elverson & Samra, 2012).The main risk factors of preterm birth among Palestinian women were multiple pregnancies, medical indications for preterm birth (mainly preeclampsia), placenta previa, abruption placenta, previous caesarean section, the presence of a disorder associated with pregnancy (mainly hypertensive disorder), preterm premature rupture of membrane, and a previous history of preterm birth (Sarhan & Anini, 2015).

Preterm neonate with RDS faces many challenges in order to survive in the extra uterine environment; for that there is a great need for the expertise and extreme refinement of nursing practice and knowledge for neonatal intensive care unit (NICU), to assure that the holistic nursing care needs of the infant are met (Madeline et al., 2017). As the preterm neonate considers as a high risk infant, this term designates to an infant who should be under close observation by experienced physicians and nurses (Nelson & Kliegman, 2016).

Nurses play an important role in caring for preterm neonates with RDS. It is necessary to ensure that all preterm neonates with RDS receive maximum supportive care. The NICU is an example of a specialized care ward, working in this area requires nurses to acquire a specialized skills and knowledge specific to neonatal development, treating prematurity, congenital abnormalities, breastfeeding and an ability to cope physically and emotionally with the demands of the role as to effectively assist the families of these infants during this time (American Nursing Association, 2013).

1.2 Problem statement

RDS in preterm neonates is truly a global problem. RDS in preterm neonates are the leading cause of early mortality (0-7 days of age). It is classified as one of the top six causes of death in preterm neonates and health condition for newborns require care in NICUs (Ricci& Kyle, 2009). Therefore, correct diagnosis and management of neonatal respiratory distress is extremely important (Elsayed et al., 2013). Reported infant mortality rate in Palestine in 2016 was 10.5 per1,000 live births. Preterm with RDS and low birth weight accounted 24.6% in the West Bank and 16.8% in the Gaza strip (G.S) of infant deaths (Ministry of Health, 2016). In addition, the number of neonatal units and incubators is not enough to accommodate the number of the premature neonate born daily in Palestine; increases infant morbidity and mortality rates (Sarhan & Anini, 2015).

A various nursing colleges and institutes in G.S graduates general nursing; Nurses work in NICUs have a bachelor's degree in nursing or just a diploma in nursing . Nursing practice without any pre training courses in hospital leads to weakness of nursing care outcomes, as well as health worker shortages and poorly equipped facilities, compounded by a lack of knowledge and competencies in dealing with premature neonate lead to inadequate care for the premature neonate (WHO, 2014a).

The nurses have not enough time to upgrade their knowledge and practice regarding preterm with RDS care, which may lead to a possible gap in the integration of knowledge into practice. therefore, there is a great need to assess the level of knowledge and practice among NICU nurses to strengthen quality of nursing care, providing continuing education for nurses to remain up to date, maintain their competence and to meet the standards of nursing practice (Mariette & Elisabeth, 2015).

American Nurses Association (ANA) mention that the NICU is an example of a specialized care ward, working in this area requires nurses to acquire a range of specialized skills and knowledge specific to neonatal development, treating prematurity, congenital abnormalities, breastfeeding and an ability to cope physically and emotionally with the demands of the role as to effectively assist the families of these infants during this time (ANA, 2013).

According to the researcher's experience there is a challenges of care provided for premature neonate with RDS include health worker shortages and poorly equipped facilities, compounded by a lack of knowledge and competencies in dealing with premature neonate with RDS lead to inadequate care for the premature neonate. Unfortunately, there is a little studies found on knowledge and practice of nursing care provided for preterm neonates suffering from RDS applied in G.S. Hopefully the current study will illustrate the quality of neonatal nursing care especially for preterm neonates with RDS.

1.3 Justification of the study

Nurses in NICUs deals with many challenges in caring with preterm neonates with RDS which include lack of standardization of nursing care, inadequate training regarding

preterm neonates with RDS care, suffering of neonates with RDS and families, the poor outcomes of RDS babies, life long complications, this challenges motivate the researcher to deeply study the quality of nursing care provided for preterm neonates suffering from RDS in NICUs in Gaza governorates. All infants born with RDS are at risk for serious health problems, the fragility of premature neonate needs proper observation & care from competent nurses and careful assessment and other therapeutic interventions as needed, A high quality , safe, competent, and cost-effective nursing care for preterm neonates with RDS is crucial in NICU. The associated complications of preterm with RDS increase the length of hospitalizations in NICU, which require high quality nursing care. Expansion of nursing knowledge and practice are important to improve the quality of nursing care provided by new high-tech equipments in NICUs (Madeline et al., 2017).

The results of this study will add an important value to the nursing profession in clinical, administration, research and academic issues. These results could detect the degree of weakness in nursing practice, and the actual demand of specialize nursing training programs which will improve the competence of nurses practice. As well as, these results will provide a clear view about the reality of nursing care provided to a preterm neonate with RDS, and the demand for new policies and strategies that will help in improve preterm neonates with RDS outcomes. Also the results of this study will explore the nurses knowledge outcome after academic study and the demand for modifying training program that offers in colleges and universities, guide health organizations to focus on training newly graduate nurses to provide competent nursing care. Finally, the results of the study will detect the gap between nurses knowledge and practice and will provide important recommendations for a new research studies. Therefore, the researcher assesses nurses knowledge and practice regarding care of a preterm neonates with RDS to strengthen Quality of nursing care.

1.4 Aim of the Study:

The aim of the current study was to assess the nursing knowledge and practice provided for preterm neonates suffering from RDS in NICUs at governmental hospital in Gaza governorates.

1.5 Objectives of the study:

1. To assess the nursing knowledge regarding nursing care provided for preterm neonates with RDS in NICUs at governmental hospital in Gaza governorates.
2. To assess the nursing practice regarding nursing care provided for preterm neonates with RDS in NICUs at governmental hospital in Gaza governorates.
3. To determine the relationship between nursing knowledge and practice regarding nursing care provided for preterm neonates with RDS and sociodemographic data in NICUs at governmental hospital in Gaza governorates.
4. To set recommendations for decision makers to improve the quality of care provided for preterm neonates in NICUs at governmental hospital in Gaza governorates.

1.6 The Research questions:

1- What is the level of nurses knowledge regarding care of preterm neonate with RDS in NICUs at governmental hospital in Gaza governorates?

2- What is the level of nurses practice regarding care of preterm neonate with RDS in NICUs at governmental hospital in Gaza governorates.?

3- Does knowledge and practice regarding nursing care provided for preterm neonates with RDS in NICUs at governmental hospital in Gaza governorates affected by work place ?

4- Does knowledge and practice regarding nursing care provided for preterm neonates with RDS in NICUs at governmental hospital in Gaza governorates affected by nurses socio demographic characteristics?

5- Is there a relationship between nurses job title and knowledge and practices provided for preterm neonates in NICUs at governmental hospital in Gaza governorates?

6- Does the nurses working in NICUs of the governmental hospital at Gaza governorates receive any formal or informal training before/during their working period in this area?

7- Does nurses education programs play a role in improving the level of knowledge and practices of nursing working in NICUs at governmental hospital in Gaza governorates?

8- Does nurses age play a role in the level of knowledge and practices regarding nursing care provided for preterm neonates with RDS in NICUs at governmental hospital in Gaza governorates?

9- Does knowledge and practices regarding nursing care provided for preterm neonates with RDS in NICUs at governmental hospital in Gaza governorates affected by nurses gender?

10- Does knowledge and practice regarding nursing care provided for preterm neonates with RDS in NICUs at governmental hospital in Gaza governorates affected by nurses qualifications?

11- Does knowledge and practice regarding nursing care provided for preterm neonates with RDS in NICUs at governmental hospital in Gaza governorates affected by nurses experience ?

1.7 Context of the study

1.7.1 Demographic context

The Gaza Strip is located along the coast of the eastern Mediterranean Sea stretches over a distance of approximately 45km from BeitHanoun city in the north to Rafah city in the south. Its width varies between 7 and 12km and the total area is about 365 km (Abdalqader, 2011). After the end of the First World War, historical Palestine was placed under the British Mandate and from 1948 to 1967 The G.S was under the Egyptian Administration, then it was occupied by the Israeli army in June 1967. Then according to Oslo agreement the Israelis officially handled the G.S to the Palestinian Authority in 1994 with partial autonomy that lead to improvement of the social and economic status of the Gaza people till the setting up of Intifada in 2000 where the political and socioeconomic situation started to deteriorate and reached to the maximum disaster in June 2007 where a terrible event occurred "the internal division" and Gaza people started to suffer from its sequences; a tight siege has been imposed on the G.S to control borders, movement of goods and travellers and form that terrible event Israel launched three large scale aggressions on the G.S which resulted in thousands of deaths and injuries among people and damage of thousands of houses, manufacture compounds, agricultural resources. So, did this difficult situation affect our people perception and relationships in work that they prefer more social work environment or because of successive life disasters, people genes were affected that reflect their readiness to participate in many social interactions and dynamics at organization. Recent reports indicate that the G.S is among the most densely populated areas worldly. According to the Palestinian Central Bureau of Statistics (PCBS), the total number of the Palestinian population residing in the G.S at the end of 2019 is around 1.99 million (PCBS, 2019).

1.7.2 The socio-economic situation

The economic status in the G.S is very low, and suffers from continuous pressure caused by long-term siege imposed by Israelis' occupation for more than 12 years. Because of this siege, a significant increase in poverty rates has occurred in G.S from 38.8% in 2011 to 53% by the end of 2017 (United Nations Office for the Coordination of Humanitarian Affairs - OCHA, 2018).

In G.S, there are three main types of localities of residence; urban, rural and camps. Around 70% of the total population is refuges. Moreover, the socio-economic status of the G.S is severely suppressed by high population density, limited land access, effects of Israeli occupation military operations and restriction on labor and trade access across the border by the siege imposing since 2007. These factors have dramatically increased the rates of unemployment and poverty in G.S The average unemployment rate is well over 41.7 % one of the highest in the world, according to the World Bank. The number of Palestine refugees relying on UNRWA for food aid has increased from fewer than 80,000 in 2000 to almost one million today (UNRWA, 2016).

1.7.3 Health care system

The healthcare system in Palestine is complex, unique and strongly influenced by the Israeli occupation. The consequences of the closures and separation imposed a great challenge for the MOH by creating obstacles regarding the accessibility to health care services and affected the unity of the health care system in all Palestinian governorates (UNRWA, 2016).

There are four main health care providers; MOH, UNRWA, Non-Governmental Organization (NGOs), and the private sector. With such multitude of service providers,

there are numerous challenges in providing a well-coordinated, standardized health service provision during normal times and frictions are deemed to exacerbate during emergencies (WHO, 2014b). UNRWA provides health-care services to the vast majority of the over 1.3 million Palestine refugees in G.S through 22 medical centers, providing Primary health care (PHC), secondary and tertiary health care services (UNRWA, 2016).

MOH is the main health care provider in the governorates; it provides PHC, secondary and tertiary services for the whole population. The number of hospitals owned by MOH in GS is 13 hospitals with capacity 1664 beds (MOH- Ramallah, 2017). It provide advanced medical services through referring patients to the neighboring countries and other private and NGO healthcare facilities. MOH has been seriously affected by the financial crisis being experienced by the Palestinian Authority. In fact, there have been reductions in the numbers of patients being referred outside the occupied Palestinian territory for specialized treatment and there have been growing and substantial shortages of medicines and disposables (WHO, 2018b).

1.7.4 Neonatal Intensive Care Unit in Gaza Governmental Hospitals

According to the last update of Gaza Neonatal Network(GNN) in 2013,there is eight hospitals have neonatal intensive care units in G.S: four of this hospitals (Alshifa complex - Al Nassr pediatric hospital-European Gaza hospital- Naser hospital) have the third level of NICUs. the total number of nurses 110 nurse with different academic levels (diploma, bacalorea, Master). the total numbers of admissions in NICUs per year in hospitals : Al Nassr pediatric hospital (1500), Alshifa complex(2400) , European Gaza hospital(528), Naser hospital (350) (GNN, 2013).

1.7.5 Palestinian Health Information Center

Palestinian Health Information Center (PHIC) is a department within the Palestinian MOH, is responsible for preparing the health information and providing health indicators on the Palestinian health situation. The mission of the Palestinian health information center is to build a national health information system that utilizes the latest technology in data collection, archiving, analyzing, dissemination and distribution to make information available for access by healthcare providers, institutions, students, researchers and parties interested in health issues (MOH-Ramallah, 2017).

1.7.6 Governmental Hospital Services

1.7.6.1 Al-Nassr Pediatric Hospital

With an area of 4400 m2, is the oldest and largest children's hospital in the Gaza Strip. It is located in Al-Nassr neighborhood, and it serves a large area of Gaza City and some of its services extend to the central and northern area in the Gaza Strip, with a capacity of 132 beds and a total hospital staff of 294 employees, the hospital's mission is to provide health services to children from birth to 12 years of age (MOH, 2018).

1.7.6.2 Al-Shifa hospital

It is the largest and oldest health institution in the GS, where it was established in 1946 on an area of 42,000 m2. It is located in the central west of Gaza City, at the crossroads intersection of Izz El-Din Al-Qassam Street. The hospital contained 597 hospitalization beds, distributed into three hospitals. These hospitals are surgical hospitals, Medical hospital and Obstetrics hospital. Each hospital has its own administrative teams. Al-Shifa hospital provides services like orthopedics, pediatrics, coronary care unit, intensive care unit, burn department and dialysis center (PHIC – MOH, 2019).

1.7.6.3 Naser (Al-Tahrir) hospital

Naser hospital which is dedicated to surgery, internal medicine, Al-Tahrir hospital for women, childbirth and children, and Al Yassin hospital, it located in Khan Younis. Khan yunis governorate has a total clinical capacity of 322 beds, with a total of 769 employees. Al-Tahrir Hospital was opened in 1999 and covers an area of 1800 square meters. The hospital has a pediatric emergency department, and two internal department for children, It includes 64 beds for children, It also has a special care baby unit for newborns. It also has a maternity department with 90 beds for maternity cases, It also has two rooms for obstetrics and gynecology(MOH, 2018).

1.7.6.4 Gaza European Hospital

is located in Khan Younis governorate. The total area of the hospital buildings is 20,000 square meters. Gaza European Hospital is a distinguished center providing medical services in the second and third level of the southern region. The hospital serves a population of 500,000 following international standards of medical care. The European Gaza Hospital is a model of administrative operations, particularly in the optimal use of information technology and the development of comprehensive medical records management and financial management systems. A large public hospital with a total clinical capacity of 256 beds, of which 203 beds are allocated for overnight use. The population in the southern governorates of the Gaza Strip is particularly distinguished by providing heart catheter service to all governorates of the Gaza Strip. The total number of hospital staff is 781 employees(MOH, 2018).

1.8 Theoretical Definitions

1. **Preterm**: It refers to a live born babies before 37 weeks of pregnancy are completed (WHO, 2017).
2. **Respiratory distress syndrome**: is a life threatening lung disorder that result from under developed and small alveoli and insufficient levels of pulmonary surfactant(Hockenberry & Wilson, 2015).

1.9 Operational definitions

1. **Knowledge**: defined by researcher as a nurses theoretical understanding of preterm with RDS nursing care issues acquired through education or experience and measure through the questionnaires constructed by the researcher of this study.
2. **Practice**: defined by researcher as a nurses practical skills of preterm with RDS nursing care issues acquired through education or experience and measure through the questionnaires constructed by the researcher of this study.
3. **Neonatal Intensive Care Unit (NICU)**: defined by researcher that unit where high-risk neonates including preterm babies are cared for

Chapter Two

Literature Review

2.1 Conceptual framework

A conceptual framework is a basic element in scientific research. It connects and clarifies the relationship between the dependent and the independent variable. The conceptual framework of the study as shown in figure 2.1, illustrates variables that interact and affect the nursing care for preterm neonates with RDS.

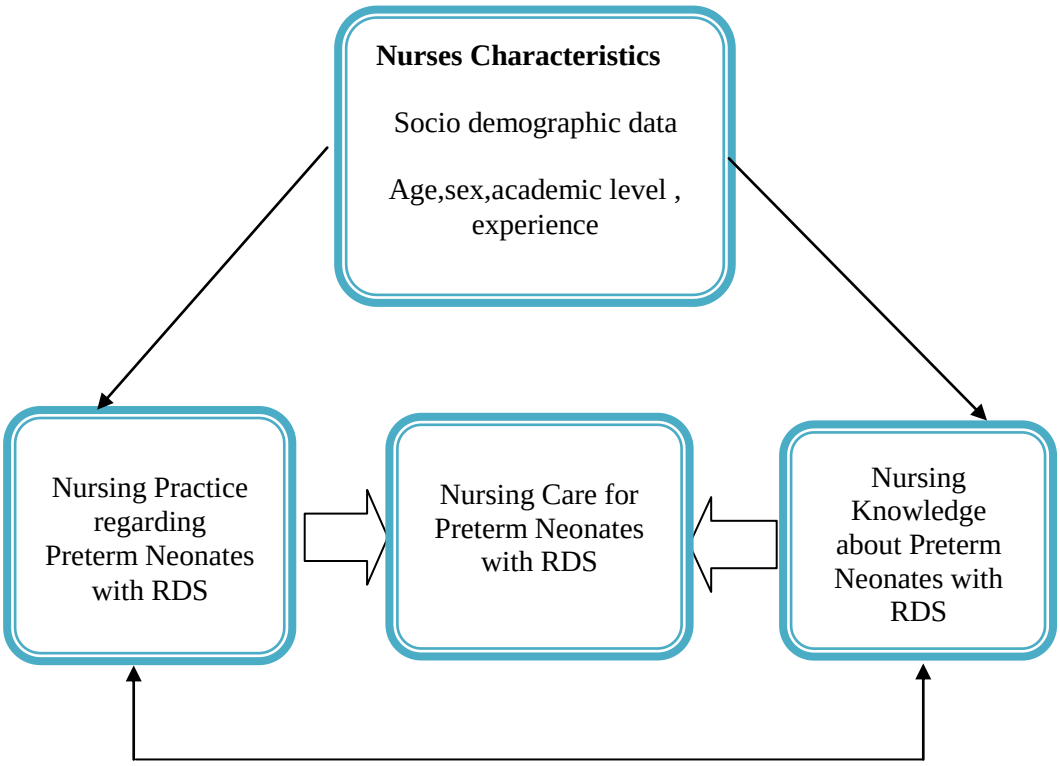

Figure (2.1): Conceptual Framework Diagram

2.2 Background

Preterm birth with RDS is the leading cause of neonatal mortality and the most common reason for postnatal hospitalization (Manuck et al., 2016). Although, preterm are prone to serious illness or death during the neonatal period (Vogel et al., 2015). Complications of prematurity are the single largest cause of neonatal death and currently the leading cause of death among children under 5 years. Therefore, global efforts to further reduce child mortality demand urgent actions to address preterm birth. Infant death and morbidity following preterm birth can be reduced through interventions provided to the mother at imminent risk of preterm birth and to the preterm infant after birth. These interventions target immediate and future morbidities of the preterm infant, e.g. lung immaturity, susceptibility to infection and neurological complications (WHO, 2017).

2.2.1 Complications

Premature neonates are more prone to short and long-term complications, including various respiratory, neurological, visual, hearing and cardiovascular problems, during infancy and early childhood (WHO, 2018a). Respiratory disorders are one of the most common morbidities in premature neonates, causing respiratory difficulties that may lead to respiratory failure (Condo et al., 2016). The most common reason for hospitalization for both full term and preterm infants is respiratory problems (Pramanik et al., 2015), in particular, Respiratory Distress Syndrome (RDS) among premature neonates (Hockenberry & Wilson, 2015).

2.2.2 Incidence

The incidence and severity of RDS are inversely related to gestational age the incidence of RDS is approximately 5% at 36 weeks of gestation rising to 70% at 24 weeks of gestation,

RDS is defined as pulmonary insufficiency due, in general, to immature lungs and airways, and specifically to a surfactant deficiency (Donn & Sinha, 2017). The clinical definition of RDS, which was formerly based on radiographic findings, analysis of blood gases and inspired oxygen concentrations, is currently based on the clinical assessment of breathing and oxygen requirement of neonates, This definitional change reflects the early management of RDS that relied on treatments such as Nasal Continuous Positive Airway Pressure (NCPAP) therapy (Sweet et al., 2017).

2.3 Definition of Preterm

The WHO defines a Preterm Birth as babies born alive before 37 weeks of pregnancy are completed. There are sub-categories of preterm birth, based on gestational age; extremely preterm (less than 28 weeks), very preterm (28 to 32 weeks) and moderate to late preterm (32 to 37 weeks) (WHO, 2017).

2.4 Risk factors

The etiology of preterm birth is multi factorial and involves a complex interaction between fetal, placental, uterine, and maternal factors, most preterm births are "spontaneous" without an identifiable cause; genetic predisposition may increase the risk of prematurity and there is a strong positive correlation exists between both preterm birth and low socioeconomic status; families of low socioeconomic status have higher rates of maternal under nutrition anemia, and illness inadequate prenatal care, drug misuse, obstetric complications and maternal history of reproductive inefficiency (abortions, stillbirths, premature or low birth weight 12 infants), although other associated factors such as single-parent families, teenage pregnancies, short inter pregnancy interval, and mothers who have borne more than 4 previous children, are also encountered more frequently in such

families, systematic differences in fetal growth have also been described in association with maternal size, birth order, sibling weight, social class, maternal smoking, and other factors (Nelson & Kliegman, 2016).

2.4.1 Maternal

When maternal complications, such as anemia or hypertensive disorders, are present, the impact on preterm delivery is difficult to reduce even with the care standards of more highly developed countries (Morisaki et al., 2014). A study applied in Northern Australia indicate that the risk factors for preterm birth were teenage motherhood, previous preterm birth, smoker status not recorded, inadequate antenatal visits, having pregnancy-induced hypertension, ante partum hemorrhage or placental complications (Kildea et al., 2017). Many risk factors for preterm birth were identified in Palestinian Women, these risk factors were: living with a nuclear family, having a previous history of preterm birth, having a family history of preterm birth, having a previous delivery by cesarean section, having a multiple pregnancy, having a congenital gynaecological problem in the cervix, uterus and placental problems, maternal smoking, vaginal infection, Preterm Premature Rupture of Membrane, vaginal bleeding during pregnancy, a disorder caused by pregnancy mainly hypertensive disorder, a disorder associated with pregnancy such as Genitourinary tract infection, Diabetes and renal disease. Also, psychological problems during current pregnancy, height and mode of delivery by cesarean section all had an effect on the occurrence of preterm labor (Sarhan & Anini, 2015).

In Gaza Strip that significant risk factors for preterm birth were: maternal age ≥35 years, being a refugee, inadequate antenatal care, failure to gain adequate weight during pregnancy and previous history of preterm birth. Other significant risk factors include; short stature, short interval between The last two pregnancies, the presence of congenital

gynecological abnormalities, previous history of cesarean delivery and previous history of stillbirth (Abu Hamad, 2007).Although there has been a considerable reduction in the number of neonatal deaths in the NICU during the last two decades, it is the management of critically ill infants that has become of major concern, as they are continuously exposed to various risk factors. These factors include exposure to various stressors in NICU such as light and noises, exposure to severe infections, high risk of accidental extubations and invasive procedures. All these factors have a detrimental effect on the growth and neurodevelopment of the critically ill preterm infants. As most of these causes are preventable, it is important to adopt various proven quality improvement initiatives to improve neonatal care outcomes (El-Atawi et al., 2019**).**

2.5 Preterm Common Health Problems

Preterm birth complications are the most common cause of death in children aged 5 years or less. Out of the 6.3 million children who died before age 5 in 2013, about 1 million (15.4%)died because of these conditions (Liu et al., 2015). Evolving technology and scientific advancement have increased the chances of survival of the extremely premature baby; however, such survival can be associated with some severe long-term morbidities (Green et al., 2016). Preterm survivors more frequently exhibit neurologic and behavioral impairment and low birth weight infants, later have cognitive deficits, poor academic performance, or attention problems then at school age, they are less socially competent and more often victimized than their peers, when they reach adolescence age , they are more often socially rejected and less attentive (Charpak et al., 2017).

RDS remains a significant cause of morbidity and mortality in preterm infants, affecting approximately 70% of all infants born<33 weeks gestational age (Canadian Neonatal Network, 2012). Apnea of prematurity is one of the most common diagnoses in the NICU, despite the frequency of apnea of prematurity, it is unknown whether recurrent apnea,

brady cardia, and hypoxemia in preterm infants are harmful (Eichenwald, 2015). It is significant to know about Retinopathy of prematurity (ROP) is a vasoproliferative disorder of the retina occurring principally in newborn preterm infants, it is an avoidable cause of childhood blindness; a simple screening test done within a few weeks after birth by an ophthalmologist can avoid this preventable blindness (Shah et al., 2016).

2.5.1 Hypothermia in Preterm

Preterm infants frequently have hypothermia when they are admitted to the NICU. Hypothermia continues to be a major problem for premature infants, necessitating special care at birth and throughout (NICU); an infant loses heat through its skin and respiratory tract to the environment through radiation, conduction, convection and evaporation. However, it is important to understand the mechanisms of heat loss so that interventions can be aimed to block the transfer of heat from the infant to the environment (Knobel, 2014). Hearing impairment is a severe consequence of prematurity and its prevalence is inversely related to the maturity of the baby (Seniuk et al., 2017).

2.5.1.1 Emotional and behavioral problems

All preterm children had twice as many increased rates of persistent, emerging, and resolving emotion behavioral problems as did term children, a persistence of these problems was more likely in early preterm children and their resolution was more likely in moderately preterm children. The study shows that pathways of emotion behavioral problems may vary per child and gestational age, this variation in persistency of emotion behavioral problems for different gestational ages 14 may offer opportunities to improve children's long-term outcomes also among the most vulnerable groups (Hornman et al., 2016).

2.5.2 Transient tachypnea of the newborn

Transient tachypnea of the newborn (TTN) is a respiratory disorder secondary to inadequate or delayed clearance of lung fluids. Early symptoms of the disease are indistinguishable from neonatal respiratory distress syndrome, pneumonia, and persistent pulmonary hypertension. Therefore, these newborns, in addition to receiving conservative management, receive antibiotics until blood cultures provide definite results, It is more often seen in male infants born via cesarean section without starting the process of labor, or born to a mother with diabetes or asthma with a history of perinatal asphyxia, Clinical findings noted in these neonates are tachypnea, expiratory grunting, nasal flaring, and intercostal retraction at or shortly after birth. These symptoms usually subside 48–72 h after birth even though they could last up to 5 days (Kim, 2016).

2.6 Respiratory distress syndrome (RDS)

Respiratory distress syndrome, also known as hyaline membrane disease (HMD), is a life threatening lung disorder that result from under developed and small alveoli and insufficient levels of pulmonary surfactant (Schraufnagel, 2010). The respiratory system is one of the last body systems to mature. Therefore, the preterm neonate is at high risk for respiratory complications. These complications affect the preterm neonates breathing ability and adjustment to extra uterine life. One of the most complications of prematurity is respiratory distress syndrome, which develop from surfactant deficiency, RDS remains single leading cause of morbidity and mortality in preterm infants, especially before 34 weeks gestation. Affecting about 70% of all infants born < 33 weeks gestational age (loutfy et al., 2014).

2.6.1 Causes of RDS

The cause of RDS is mainly from insufficient of a protective substance called surfactant, this substance help the lungs to inflate with air and keeps the alveoli from return collapsing (Elsayed et al., 2013). Preterm neonate with RDS have poor lung compliance, they usually need for respiratory support with oxygen supplement and may need mechanical ventilation for long period, leading to interstitial edema and epithelial injury (loutfy et al., 2014).

The stem of the RDS problem is the imbalance ratio between ventilation–perfusion, which lead to hyper capnia and hypoxemia. Surfactant is a substance that fetus lungs start production at around 26 to 34 weeks of pregnancy. Delaying birth extra time gives lung tissue chance to mature and improves lung function of preterm neonate at birth . During the delay, mothers of preterm neonates may be prescribed steroids, which can help in speed the development of preterm neonates lungs. steroids help in increase the production of surfactant (Jeenakeri & Drayton, 2009).

2.6.2 Symptoms of RDS

A neonates with RDS may have rapid shallow breathing, Grunting sounds during exhalation, Sharp pulling on the chest below the ribs with each breath taken in, Flaring of the nostrils during breathing. As the result, the preterm neonates with RDS require attention by neonatal caregivers. Its important to evaluate the level of fetal lung maturity before birth, lab tests used to evaluate fetal lung maturity are phosphatidyl Glycerol, is synthesized from mature lung alveolar cells and Lecithin Sphingomyelin (L/S) ratio which are detected in the amniotic fluid. To establish RDS diagnosis the clinical picture of preterm and x-ray findings is necessary with other lab tests (Elsayed et al., 2013).

2.6.3 Factors increase the risk for neonatal RDS

Factors that increase the risk for neonatal RDS; including prematurity, diabetic mother, multiple pregnancy, rapid labor and cesarean delivery that reduce blood flow to the baby. The earlier a baby is born, the less developed lungs and the higher chance of neonatal RDS, high-risk and premature infants require prompt attention by a neonatal resuscitation team (Joyce et al., 2008).

2.6.4 Management of RDS

Due to medical and technological advances over the past few decades, including the use of noninvasive assisted ventilation, for example, Nasal Continuous Positive Airway Pressure (NCPAP), and early management of clinical manifestations of RDS, the survival rate for premature neonates with RDS has dramatically improved in developed countries (Owen et al., 2017). It is worth noting that the respiratory care provided for premature neonates by NICU nurses, for example assisting with resuscitation, suctioning, oxygen administration and monitoring oxygen saturation, and thermoregulation, requires specialized knowledge and skills (Lista et al., 2013). Inadequate nursing knowledge of the proper care of premature infants on ventilation devices such as NCPAP may place them at greater risk for developing complications.

The neonates who show signs of RDS quickly moved to NICU, to receive treatment from health care professionals who specialized in treating premature neonates. Management of RDS range from oxygen supplement to relieve RDS symptoms, continuous positive airway pressure (CPAP) can keep the airways open, or may extend to a mechanical ventilation and surfactant therapy, especially for preterm with respiratory acidosis manifestation. Nurses play an important role in caring for preterm neonates with RDS. Its necessary to assure that all preterm neonates with RDS receive maximum supportive care which include gentle

handling, also its important to maintaining body temperature and careful fluid management, physical examination to note any early signs of RDS, count respiratory rate and assess level of grunting to assess the severity of RDS. Additionally the nurse should assess the readiness of emergency equipments for any emergency situation as the event of cardiac or respiratory arrest (Loutfy et al., 2014).

2.6.5 Status of Vitamin D as a Risk Factor for RDS

Vitamin D supplementation decreases the risk of RDS, improves the quality of life, and is relatively effective and safe for preterm neonates as well as during lung maturation. However, although vitamin D supplementation may offer benefits for respiratory distress syndrome, vitamin D has been reported to play roles in musculoskeletal function, regulation of hormone secretion, immune system function and regulation of cell proliferation and differentiation, In its classic function, small doses of vitamin D are necessary to regulate the calcium and phosphate balance and it also plays an anti-inflammatory role. In addition, vitamin D receptor interacts with many chromosomes to effect different organs. Vitamin D is naturally obtained from sunlight and synthesized by the body (Bikle , 2018).

More recently, vitamin D has been shown to assist in lung maturation. The correlation between lung maturation and vitamin D is explained by the mechanism of phospholipid (surfactant) production and secretion on the surface of alveolar type II (ATII) cells. The concentration of surfactant in ATII cells is associated with pregnancy gestation. Therefore, the maturation of lung surfactant also progresses with pregnancy gestation **(**Lykkedegn et al., 2015).

Chen et al. (2016) confirmed that the vitamin D metabolite ($1,25(OH)_2D_3$) increased the presence of phospholipids, which are a primary component of surfactants. They found that dexamethasone could also increase the presence of phospholipids, but the mechanism was unclear. Conversely, the secosteroid vitamin D has been shown to have the same mechanism as dexamethasone when administered for respiratory distress syndrome treatment .

Zosky et al. (2011) employed another approach to investigate the mechanism of vitamin D with various intervention doses in newborn with the aim to determine the development of lung volume, lung mechanics, and lung structure. In this study, they found a correlation between vitamin D deficiency and lung maturation, supporting the association of vitamin D status with respiratory distress syndrome .

2.6.6 Risk factors of preterm with RDS in Palestine

In Gaza strip study applied by Abu Hamad, identified the significant risk factors for preterm birth. These risk factors include: maternal age > 35 years, living as refugee increase risk for preterm , inadequate antenatal care , failure to gain adequate weight during pregnancy and previous history of preterm birth with RDS. Other significant maternal risk factors include: short stature, short interval between the last two pregnancies, the presence of congenital gynecological abnormalities, previous history of cesarean delivery and previous history of stillbirth (Abu Hamad, 2007).

Study applied in palestine identified many risk factors lead for preterm birth in palestinian women. There is multi risk factors found by this study: social factors as living with a nuclear family, medical factors as having a previous history of preterm , a previous delivery by cesarean section, having a multiple pregnancy, having a congenital gynaecological problem in the cervix, uterus and placental problems, maternal smoking,

vaginal infection, premature rupture of membrane, vaginal bleeding during pregnancy, a disorder caused by pregnancy mainly hypertensive disorder, a disorder associated with pregnancy such as genitourinary tract infection, diabetes, and renal disease. Physiological problems during current pregnancy (Sarhan & Anini, 2015).

2.7 Epidemiology

Globally:

Every year, an estimated 15 million babies are born preterm, and this number is rising. That is more than 1 in 10 babies. approximately 1 million children die each year due to complications of preterm birth (Liu, 2016). RDS remains a significant cause of morbidity and mortality in preterm infants, affecting approximately 70% of all infants born <33weeks gestational age (CNN, 2012).

Developed countries:

In developed countries such as (U.S) according to Centers for Disease Control and Prevention (CDC), preterm birth in the (U.S) affected about one of every 10 infants born in 2016. African American women had (14%) preterm birth , it was about 50 percent higher than the rate of white women (9%). Preterm birth rates decreased from 2007 to 2014. According to CDC, research shows this decrease in prematurity is due to decrease in the number of births to teens girls and young mothers. Then in 2016, the prematurity rate rose for the second straight year (CDC, 2017).

Neonatal RDS is most commonly seen in premature infants. The condition makes the neonate's difficult to breathe. Neonatal RDS occurs in infants whose lungs have not yet fully developed. The disease is mainly caused by lack of a protective substance called surfactant, which helps the lungs inflate with air and keeps the air sacs from collapsing.

Acute respiratory distress syndrome is a sudden, progressive form of respiratory failure characterized by severe dyspnea, hypoxemia and diffuse bilateral infiltrates. It is a life threatening lung disorder that commonly affects premature infants (Joyce et al., 2008)**.**

Developing countries:

In developing countries, the fatality rate for neonatal respiratory distress can approach 20% (Duke, 2014). In Jordan, the neonatal mortality rate is estimated to be 14 per 1000 births, RDS being the leading cause (Department of Statistics Jordan, 2013). Seventy five percent of neonatal deaths can be prevented by providing proper medical care during delivery and the immediate post-partum period. Unfortunately, about 60% of neonatal deaths are attributable to poor medical care (Batieha et al., 2016).

Arab Countries:

In Egypt (2011), the prematurity rate was 7.4% (Blencowe et al., 2012) and the proportion of deaths from the complications of prematurity estimated by 45% of all neonatal death (Liu et al., 2012). Neonatal RDS is a one of the most common complications of prematurity (Lissauer & Fanaroff, 2011).

Low using of technology in middle-income settings is causing an increased burden of disability among preterm with RDS babies who survive the neonatal period, inequalities in survival rates around the world are stark; in low-income settings, half of the babies born at or below 32 weeks (2 months early) die due to a lack of feasible, cost-effective care, such as warmth, breastfeeding support, and basic care for infections and breathing difficulties, in the opposite in high-income countries, almost all of these babies survive (WHO, 2017). There is a dramatic difference in survival of premature with RDS babies depending on where they are born. For example, more than 90% of extremely preterm babies (less than 28 weeks) born in low-income countries die within the first few days of life; yet less than 10% of extremely preterm babies die in high-income settings (WHO, 2017).

In the lower-income countries, an average, 12% of babies are born too early risk for RDS compared with 9% in higher-income countries (WHO, 2017).The United States and Brazil both rank among the top 10 countries with the highest number of preterm births. In the United States, for example, about 12 percent, or more than one in nine of all births, are preterm (WHO, 2017). Preterm with RDS birth rates remain higher in the USA, where nearly one in every eight infants is born early, compared to other developed countries (Frey & Klebanoff, 2016).

In Srilanka, neonatal RDS deaths have been estimated to be approximately 4 million while the infant mortality rate is 11.2 per 1000 live births. Neonates are at risk for death due to various health problems, even though they have been born with average birth weights, thus the morbidity and mortality rates in newborn infants are higher (kumar et al., 2014).

In Arab countries half of the neonates born at or less than 32 weeks die due to breathing problems (RDS), there is a dramatic difference in survival of preterm neonates with RDS depending on the place of born. Data from several countries show significant variations on the contribution of preterm birth to under five deaths. Deaths due to preterm birth complications as percentage of all under five deaths, Jordan 24%, Lebanon 22%, Libya 21%, Iraq 20%, Egypt 20% and Palestine 16% (WHO, 2017).

Palestine:

In palestine the reported infant mortality rate in 2016 was 10.5 per 1000 live births, preterm with RDS and low birth weight accounted 24.6% in the West Bank and 16.8% in the G.S of infant deaths (MOH, 2016). There is few studies in Gaza Strip regarding care provided for preterm neonates with RDS in governmental hospitals

2.8 Nursing care of preterm neonate with RDS

The nurse carefully assess the infant's respiratory status to determine the degree of respiratory distress, assess the infant's cardiac rate & rhythm; count the apical pulse for one minute, note if irregularities in the rate or bounding pulses, also observing the infant's general activity and promoting adequate gas exchange, nurses have a key role in the care of high risk and preterm infants to decrease neonatal mortality and morbidity. Nursing management for neonates with RDS through assist newborn with ET intubation, maintain mechanical ventilation as indicated, measure oxygen concentration , continuous monitoring of the SaO2, observe the infant's response to oxygen, Suctionnig as needed because the gag reflex is weak and cough is ineffective. Moreover, promoting adequate nutrition and hydration is important**,** A crucial nursing goals includes maintenance of normothermia, prevention of infection, maintenance of fluids and electrolyte balance and promotes adequate nutrition via gavages feeding, supportive and closely monitor respiratory and cardiovascular status Also, comfort measures such as hygiene and positioning as well as maintenance of nutrition are also key of nursing intervention. Successful nursing care requires careful monitoring and attention to mucous plugging that can occur in neonates placed on a ventilator after surfactant administration therefore, close observation for adequate lung expansion are critical. Moreover, psychological support to the family as well as education about NICU procedures will be especially important (Elsayed et al., 2013).

Strategies to prevent preterm birth include maternal cervical cerclage, bed rest, treatment of infections and administration of tocolytic medications. Tocolytic drugs are used in an attempt to inhibit preterm delivery by relaxing the uterine muscles, whereas their main purpose is to delay delivery for at least 48 hours while maternal steroids are administered.

Additionally, prevention of neonatal cold stress, birth asphyxia and hypovolemia reduces the risk of neonatal RDS (El-Nagger et al., 2013).

A Studies conducted in Egypt, Turkey and Saudi Arabia have identified knowledge deficits among neonatal nurses charged with caring for preterm neonates with RDS and administering assisted ventilation (Elsayed et al., 2013, Loutfy et al., 2014). Assessing neonates for signs of RDS is crucial when diagnosing and treating this condition. Qualified, well-trained nurses can help preterm neonates recover from RDS and prevent complications (Lista et al., 2013). This explains the need to assess nurses' knowledge and the quality of their practice.

A few studies (Tiryaki & Cinar, 2016, Loutfy et al., 2014, Elsayed et al., 2013) conducted in developing countries have examined nursing knowledge and quality of practice relating to the care of premature neonates in general and RDS care in particular. The authors found that educational interventions aimed at improving nursing knowledge of RDS and RDS therapies were few in number. Shrestha et al., (2013) suggest that periodic training and educational programs for neonatal nurses would enhance their knowledge. Advancing nursing knowledge and developing caring skills through continuous education would serve to enhance their professional values (Brown et al., 2015) and thus the quality of their care (Kim et al., 2015).

A study conducted in NICU at Children's Hospital, London Health Sciences provide study to evaluation of a practice guideline for the management of respiratory distress syndrome in preterm infants, An historical cohort of very preterm infants (gestational age 26 to 32 weeks) born one year before guideline implementation was compared with a similar cohort of infants born one year following guideline implementation. Data were collected retrospectively from the local neonatal intensive care unit database. The implementation of the practice guideline helped to minimize the use of ongoing mechanical ventilation in preterm infants (Bhandari, 2013).

A descriptive study in life science journal assessed the nurses' knowledge and performance regarding their care provided for neonates with RDS in the NICUs. Subjects and Methods: The study was carried out in the Neonatal Intensive Care Units at Al-Noor Specialist Hospital and Heraa General Hospital in Makkah Al-Mukramah. A convenient sample composed of 50 nurses who were working in the NICUs and providing the care for the neonates with RDS, the study concluded that nurses' knowledge in both hospitals at Al-Noor Specialist Hospital and Heraa General Hospital at Makkah Al-Mukarrama had unsatisfactory knowledge regarding the neonatal RDS meanwhile the majority of them had competent performance regarding their care provided for neonates' with RDS (Elsayed et al., 2013).

A descriptive research design was utilized on 48 neonatal nurses and 71 preterm infants. The nurses were working in the neonatal intensive care units of El-Nasr, El-Tadamon, and Port-Fouad General hospitals in Port Said City in Egypt, The study's results indicated that less than two-thirds of the studied nurses had poor level of knowledge and more than half of them had poor level of practice, the study concluded that there was a highly statistical significant correlation between the studied nurses' total knowledge mean scores and their total practice mean scores (Loutfy A et al.,2014).

2.8.1 Practice guideline for the management of RDS in preterm infants

The guideline was used to determine which respiratory management strategy was the most appropriate. The guideline incorporated four different approaches to RDS management Options included: No respiratory support if the infant did not require any supplemental oxygen or exhibit any signs of respiratory distress following resuscitation, they were not placed on respiratory support and were admitted to the NICU for continued observation and monitoring, CPAP: If the infant exhibited signs of respiratory distress or required

supplemental oxygen following resuscitation, they were given CPAP using a T-piece resuscitator and mask. If the fraction of inspired oxygen (FiO2) requirements remained<0.30 on CPAP, the infant was admitted to the NICU and placed on CPAP pressure of 4 cmH20 to 6 cmH20. If the infant's FiO2 requirements increased to ≥0.40 on CPAP, they were electively intubated with premedication and given surfactant using a flow inflating bag and assessed for extubation using criteria described below, insure method: If the infant exhibited signs of respiratory distress and required an FiO2 of ≥0.30 on CPAP following resuscitation, they were eligible for the insure method. The infant was electively intubated without premedication and given surfactant using a T-piece resuscitator. Infants requiring intubation at birth for resuscitation were given surfactant prophylactically. Infants were eligible for immediate extubation if they were breathing spontaneously and had an FiO2 requirement of<0.30. All infants were placed on a CPAP level of 4 cmH20 to 6 cmH20 following extubation, Mechanical ventilation: Infants with a poor respiratory drive or an FiO2 requirement >0.30following intubation and surfactant delivery remained intubated and received ongoing MV on admission to the NICU. The timing of extubation was at the discretion of the medical team and was not predefined by this guideline **(** Read et al., 2016).

2.8.2 Surfactant Therapy

Surfactant therapy plays an essential role in management of RDS as it reduces pneumothorax and improves survival. However, intratracheal administration requires skill and may cause harm, particularly if uncontrolled positive pressure is applied to the newborn lung. Prior to 2013 prophylactic surfactant was recommended for the smallest babies as it improved survival in clinical trials from the pre-CPAP era. After 2013, with increased use of antenatal steroids and early initiation of CPAP, outcomes are best if

surfactant is reserved for infants showing clinical signs of RDS, and for the smallest infants early initiation of CPAP may avoid the harmful effects of intubation and mechanical ventilation (MV) during the transitional phase. The overall aim is to avoid invasive MV if possible and give surfactant as early as possible in the course of RDS once it is deemed necessary (Aldana et al., 2017).

2.8.3 Surfactant Administration Methods

Surfactant administration requires an experienced practitioner with intubation skills and ability to provide MV if required. Most surfactant clinical trials to date have used tracheal intubation, bolus administration with distribution of surfactant using intermittent positive pressure ventilation, either manually or with a ventilator, followed by a period of weaning from MV as lung compliance improves. The insure technique allows surfactant to be given without ongoing MV and was endorsed previously as it may reduce BPD. In the last decade, new methods for administering surfactant using a fine catheter placed in the trachea under direct or video-laryngoscopy, with the infant spontaneously breathing on CPAP, have been described, thereby avoiding exposure to positive pressure ventilation. Specialised catheters designed for this method, known as less invasive surfactant administration (LISA), are commercially available. Since the 2016 Guideline, there have been further randomised trials and meta-analyses comparing these methods. These suggest that LISA is superior in terms of reducing need for MV and the combined outcome of death or BPD (Aldana et al., 2017).

However, these meta-analyses include some studies that are open to bias and might not be suitable for inclusion in a more rigorous systematic review. Nevertheless, studies of higher quality, such as those from the German Neonatal Network, all show trends for improvement favouring LISA, and it is reasonable to recommend it as the optimal method

of surfactant administration for spontaneously breathing babies who are stable on CPAP. Some units also employ strategies of prophylactic LISA for the smallest babies, although this has not yet been tested in randomised controlled trials (Klebermass et al., 2013). One of the advantages of LISA is that the temptation to continue MV following surfactant is removed. This makes the issue of sedation for the procedure more complex. It is considered good practice to avoid discomfort during elective intubation by using a sedative or analgesic such as fentanyl, propofol or midazolam . Using low-dose sedation prior to laryngoscopy for the LISA procedure is technically feasible, will make the baby less uncomfortable but will increase the risk of CPAP failure (Dekker et al., 2018).

At present, there is no clear answer about whether to sedate routinely for LISA, and individual neonatologists must decide for themselves. Surfactant delivered by nebulisation would be truly non-invasive. With development of vibrating membrane nebulisers, it is possible to atomise surfactant, although only one clinical trial has shown that nebulising surfactant when on CPAP reduces need for MV compared to CPAP alone, and this finding was limited to a subgroup of more mature infants of 32–33 weeks (Minocchieri et al., 2018). Further trials of nebulisation are ongoing. Surfactant has also been administered by laryngeal mask airway, and one clinical trial shows that this reduces need for intubation and MV (Roberts et al., 2018). However, the size of currently available laryngeal masks limits use of the method to relatively mature preterm infants, and routine use for smaller infants at greatest risk of BPD is not recommended (Bansal et al., 2017). Pharyngeal deposition of surfactant at birth is also currently being tested in clinical trials.

2.8.4 When to Treat with Surfactant for preterm neonate with RDS?

If intubation is required as part of stabilisation, then surfactant should be given immediately as the main purpose of avoiding surfactant prophylaxis is to avoid intubation.

Many preterm infants will transition successfully on CPAP. Those with RDS will develop progressively worsening lung disease, clinically presenting as increased work of breathing, sternal recession and increasing oxygen requirements to maintain normal saturations. Spontaneous recovery usually begins after 48 -72 hrs and some infants with milder disease may manage without surfactant, thereby avoiding the discomfort of laryngoscopy and potential deleterious effects of intubation. Early trials showed that surfactant given earlier in the course of disease works better than later in terms of reducing air leaks and avoiding MV if the insure technique is used (Bahadue et al., 2012).

Severity of RDS can only be determined clinically using a combination of FiO2 to maintain normal saturations, coupled with judgement of work of breathing and degree of aeration of the lungs on Chest X-ray, all of which can be influenced by CPAP. Lung ultrasound may be a useful adjunct to clinical decision making in experienced hands, with RDS lungs having a specific appearance that can be differentiated from other common neonatal respiratory disorders and it has potential to reduce X-ray exposure (Escourrou & De Luca , 2016). Rapid bedside tests to accurately determine presence or absence of surfactant in gastric aspirate are currently being tested in clinical trials (Verder et al., 2017).

The 2013 Guideline suggested that surfactant should be administered when FiO2 >0.30 for very immature babies and >0.40 for more mature infants based on thresholds used in the early clinical trials. Observational studies have confirmed that FiO2 exceeding 0.30 in the first hours after birth in babies on CPAP is a reasonably good test for predicting subsequent CPAP failure. Therefore it is recommended that the threshold of FiO2 >0.30 is used for all babies with a clinical diagnosis of RDS, especially in the early phase of worsening disease (Dargaville et al., 2013).

More than one dose of surfactant may be needed. Clinical trials comparing multiple doses to a single dose showed fewer air leaks, although these were conducted in an era when babies were maintained on MV. Today many infants are maintained on non-invasive ventilation even when surfactant is required. Need for re-dosing can be minimised by using the larger dose of 200 mg/kg of poractantalfa (Singh et al., 2015). Prediction of insure failure using clinical criteria and blood gases could define a population that would be reasonable to maintain on MV for a while after surfactant has been given (Brix et al., 2014).

2.8.5 Non-Invasive Respiratory Support

Recently, it has been emphasised that preterm infants should be managed without MV where possible and if ventilation is needed to minimise the time an endotracheal tube is used. Use of non-invasive respiratory support has increased with an expansion of methods to achieve it, but there is often a paucity of evidence to determine which method is most effective. CPAP has been used for over 40 years with early trials showing that it improves oxygenation, regulates breathing and is effective at reducing reintubation following extubation. CPAP is now recommended as the optimal first mode of respiratory support although other modes of non-invasive support from birth are being tested in clinical trials (Subramaniam et al., 2016).

CPAP involves delivering gas, ideally heated and humidified, with a measurable and controllable pressure. This pressure is transmitted using an interface such as short soft nasal prongs or mask connected tightly to the baby's face creating a seal. Pressures conveyed to the nasopharynx are typically kept between 5 and 9 cm H_2O providing several theoretical benefits including splinting the upper airway, maintaining lung expansion and preventing end-expiratory alveolar collapse, Higher pressures improve oxygenation but

potentially increase risk of air leak. Using an underwater seal to generate the pressure, or " Bubble CPAP " generates small fluctuations around the set pressure which some believe offers additional advantage (Welty, 2016).

Using a flow driver to generate CPAP has the theoretical advantage of offloading expiratory work of breathing (the Coanda effect), although no important clinical differences have been shown among devices used to deliver CPAP, but the simplicity of bubble CPAP systems allows their use in low-income settings (Mazmanyan et al., 2016). Trials comparing interfaces show no differences between nasal prongs and short pharyngeal tubes for initial stabilisation in the delivery room, but for prolonged use nasal masks may be most effective (Say et al., 2016). All CPAP interfaces carry a risk of facial distortion and nasal trauma. When weaning smaller babies from CPAP, gradual reduction rather than sudden cessation of pressure results in greater likelihood of weaning on the first attempt (Jensen et al., 2018).

2.8.6 Caffeine Therapy

Optimising success of non-invasive support involves use of caffeine therapy as a respiratory stimulant. Most information about the clinical effects of caffeine comes from the Caffeine for Apnea of Prematurity (CAP) study cohort where 2,006 babies <1,251 g coming off ventilation or with apnoeic episodes were randomised to caffeine or placebo. Caffeine facilitated earlier extubation with reduction in BPD and better neurodevelopmental outcomes at 18 months. In this cohort, at age 11 years the caffeine-treated children had better respiratory function and reduced risk of motor impairment (Schmidt et al., 2017).

Caffeine prophylaxis soon after admission has become standard based on cohort studies showing that earlier initiation of caffeine is associated with better outcomes (Lodha et al., 2019); however, a clinical trial of prophylactic caffeine versus placebo was abandoned early because of perceived worse outcome in the caffeine-treated group (Amaro et al., 2018). The standard dosing regimen of caffeine citrate is loading with 20 mg/kg followed by maintenance of 5–10 mg/kg/day. Higher doses of up to 20 mg/kg/day may be even more effective, but this needs further testing in randomised trials as higher doses are also associated with increased risk of cerebellar haemorrhage, hypertonicity and increased seizure burden (Vesoulis et al., 2016).

2.8.7 Pain and Sedation

Sedation and analgesia are controversial issues in RDS management (McPherson & Inder, 2017). The number of painful procedures experienced in the first month of life is associated with lower cognitive development and head circumference at 1 year, although this is unlikely to be direct cause and effect (Coviello et al., 2018). Whilst the comfort of the baby needs to be considered, there is a tension between appropriate analgesia and the effects of sedation causing harm particularly when there is an emphasis of minimising duration of invasive respiratory support. Laryngoscopy is undoubtedly uncomfortable, but when attempting LISA there is a better chance of achieving a success without sedation (Dekker et al., 2018). For planned non-urgent intubations, many clinicians prefer to use a combination of a short-acting opiate, muscle relaxant and atropine to maximise comfort and improve chances of successful intubation (Durrmeyer et al., 2014). Longer-acting muscle relaxants like vecuronium may increase the need for ventilation and should not be used. Routine sedation of ventilated neonates with opiates or midazolam is not supported by evidence (Ng et al., 2017). Sucrose analgesia and other non-pharmacological methods may be employed to reduce minor procedural pain (Stevens et al., 2016).

2.8.8 Monitoring and Supportive Care

To achieve best outcomes for preterm babies with RDS, optimal supportive care with monitoring physiological variables is important. Oxygen blenders should be available in the delivery room and in the NICU. Pulse oximetry from birth provides information of response to stabilisation. In the NICU, there should be access to continuous pulse oximetry, ECG monitoring and monitoring of $PaCO_2$ levels. Detection of exhaled CO_2 can ensure correct placement of endotracheal tubes, and continuous measurement of end-tidal CO_2 also gives useful information showing trends in gas exchange. Umbilical arterial cannulation is indicated if it is anticipated there will be need for regular blood gas analyses. Transcutaneous oxygen and CO_2 monitoring can also be used to access continuous information for trending but can cause skin injury especially in the most immature infants (Bruschettini et al., 2016).

Methods of monitoring cerebral oxygenation are also available with potential to assess cerebral saturation, but no clear clinical benefit has been identified. Close monitoring of serum electrolytes and haematological values is necessary ideally using micro-sampling techniques. Blood pressure should be recorded by indwelling arterial lines or intermittently using approved oscillometric devices. Around-the-clock access to radiology services and portable ultrasound is also essential as these are often used to confirm RDS diagnosis, exclude air leaks and confirm correct placement of endotracheal tubes and central lines (Hyttel-Sorensen et al., 2017).

2.8.9 Temperature Control

Maintaining body temperature between 36.5 and 37.5°C at all times is recommended as hypothermia is associated with worse outcome, although it is unclear if this is direct cause and effect (Wilson et al., 2016). After birth, immediate wrapping in a polythene bag under a radiant warmer reduces heat loss (McCall et al., 2018). Servo-controlled incubators with skin temperature set at 36.5°C decrease neonatal mortality. Following stabilisation, infants should be nursed in incubators with high relative humidity to reduce insensible water losses. For the smallest babies, humidity of 60–80% should be used initially and reduced as skin integrity improves. Kangaroo Mother Care (KMC) is an effective means of maintaining temperature and improving outcomes in lower income settings and is increasingly being used in NICU to maximise maternal-infant bonding even in ventilated babies with the potential for benefits beyond hospital discharge (Charpak et al., 2017).

2.8.10 Prevention and management of hypothermia for preterm with RDS

Due to the high surface area to volume ratio the infants are at a high risk of rapid heat loss which leads to hypothermia. It is even more of a concern in the very low birth weight infants admitted to NICU. Prolonged heat loss results in an increased expenditure of calories in producing heat, rather than enhancing growth and development, introduced a quality improvement initiative for the management of hypothermia in very low- birth weight infants in an NICU. All the premature infants were placed in a bag immediately after birth from the neck down. These occlusive bags prevented the hypothermia. Evidence indicated that preterm (less than 37 weeks) and low birth weight (less than 1.5 kg) infants are more prone to hypothermia during the perioperative period than their mature and normal weight counterparts. Hypothermia has shown to be a declining trend from 23% to 6% after the introduction of quality improvement interventions like transport protocol and maintenance and continuous monitoring of the rectal temperatures (El-Atawi et al., 2019).

2.8.11 Antibiotics

Antibiotics are often started in babies with RDS until sepsis has been ruled out but policies should be in place to narrow the spectrum and minimise unnecessary exposure. Routine antibiotic prophylaxis may do more harm than good (Cotten, 2015). Guidelines usually offer advice on when to screen for sepsis based on additional risk factors such as maternal chorioamnionitis or early signs of septicemia to ensure that antibiotics are only prescribed for those at greatest risk, it is reasonable not to use routine antibiotics in preterm babies with RDS at low risk such as following planned delivery by elective CS. If screening is necessary, then antibiotics are started empirically while waiting for test results. For those who have been started empirically on antibiotics the shortest possible course should be used and stopping after 36 h is achievable and considered good practice (McPherson et al., 2018).

2.8.12 Early Fluids and Nutritional Support

The smallest infants have very high initial trans cutaneous losses of water, and water and sodium move from the interstitial to the intravascular compartments making fluid balance challenging. Typically, fluids are initiated at about 70–80 mL/kg/day and adjustments individualised according to fluid balance, weight change and serum electrolyte levels. A moderate early postnatal weight loss is normal. Regimens with more restricted fluids have better outcomes with reductions in PDA, NEC and BPD (Bell & Acarregui, 2014). Delaying introduction of sodium supplementation until beyond the third day or 5% weight loss will also improve outcome (Barrington, 2014). Parenteral nutrition should be started immediately as enteral feeding is initially limited. Early initiation of higher levels of parenteral amino acids results in less postnatal growth failure and an increase in positive protein balance (Osborn et al., 2018). At least 1.5 g/kg intravenous protein and 1–2 g/kg

lipids should be started from day one and increased to a maximum of 3.5 g/kg amino acid (Mihatsch et al., 2018). For stable infants, a small amount (0.5–1 mL/kg/h) of breast milk can be started early to initiate enteral feeding. There is no evidence of increased NEC with advancing feeds fairly rapidly up to 30 mL/kg/day in stable VLBW babies (Oddie et al., 2017). Mother's milk is the preferred option for initiation of feeding however, if not available then pasteurised donor breast milk is better than formula for reducing risk of NEC but will result in slower postnatal growth (Quigley et al., 2018).

2.8.13 Developmental care

Developmentally supportive care is the common philosophy in most NICUs in the United States

(Vergara & Bigsby, 2004). Developmental care is defined as abroad category of interventions designed to minimize the stress placed on the infant and the family by the NICU environment. Developmental care based on the principle of understanding each infants neurological capacities to provide interventions that are developmentally supportive, family centered, sensitive, evidence-based and collaborative (Barbosa, 2013).

2.8.14 Hand hygiene

Hand hygiene plays an important role in preventing nosocomial infection in NICUs. Infections are easily transmitted during the day to-day caring process in the NICU. Some of the factors which are responsible for infections and which can be curbed by maintaining hand hygiene such as: inserting a central venous catheter, Blood sample collection, Treating and dressing of wounds Changing parenteral fluid, Infusing drugs through intravenous route, Maintaining a central line Suctioning through the endotracheal tube, Prolonged contact with the infant while providing care like bathing, changing position,

physiotherapy, Daily vitals recording, Administering drugs through the oral route, Tube feeding, Skin contact while changing diapers (Barbosa et al., 2019).

2.9 Neonatal Intensive Care Unit

The neonatal intensive care unit is consider a therapeutic environment appropriate for treatment of the newborn in a serious condition. The fragility and powerless of these newborns lead to increasing implementation of high-risk procedures and the low tolerance to medication errors are some of the concerns of nursing professionals working in the NICU. These units are specialized branches which require competent employees. Nurses are included among the employees working in NICUs and they must be proficient in providing proper care to preterm newborns and the use of high-tech equipment among other things. The availability of NICU has improved the outcomes of high-risk infants born either preterm or with serious medical or surgical conditions (Montanholi, 2011).

Neonatal morbidity and mortality are recognized as a global public health challenge in developing countries, with the highest rate of mortality found in the poorest countries. The first four weeks of an infant's life is their most vulnerable period during which they are prone to significant morbidity and mortality. The NICU did not exist until the early 1960s and the specialty of neonatology did not begin until the 1970s. These special units were established soon after the death of President John F. Kennedy's newborn son, who died of respiratory distress and immature lungs. He was born prematurely after just thirty-four weeks of gestation. His death brought increased awareness in the United States to the numbers of preterm infants who were dying because of immature lung development shortly after their births. Knowledge and expert care of these infants increased, and by the early 1990s more than 90 percent of these premature infants were surviving, including those infants born as early after just twenty-four weeks of gestation. Exposure of neonates to

infections, birth asphyxia and birth before term are considered as the most common causes of neonatal deaths. However, these common causes of the neonatal mortality in the neonatal intensive care units are mostly preventable (El-Atawi et al., 2019).

2.9.1 Nursing practice in (NICU)

Of all caregivers in the NICU, nurses usually spend the most time at the baby's bedside (Angel, 2015) At birth the measures needed to clear the airway, initiate breathing, care for the umbilical cord and eyes and administer vitamin K are the same for preterm as for those of normal weight and maturity. Special care is required to maintain a patent airway. Additional considerations are the need for thermal control and monitoring of the heart rate and respiration, oxygen therapy and special attention to the details of fluid requirements and nutrition. Safeguards against infection can never be relaxed, routine procedures that disturb these preterm may result in hypoxia. The need for regular and active participation by the parents in the preterm care in the nursery, the need to instruct the mother in the at-home care of her preterm and the question of prognosis for later growth and development require special consideration (Nelson & Kliegman, 2016).

For technological advances to be duly incorporated by nursing professionals, they must acquire appropriate knowledge and practices, which are obtained through specific training, information and ongoing education (Peres & Oliveira, 2014). A study conducted in the United States highlights the neonatal nurse as the mainstay of the NICU, The nurse is the person who works together with the doctor in the decision conducting treatment, performing direct neonatal care and offering emotional support to families (Hendricks & Munoz, 2007).

Nurses and physicians working in the NICU who are responsible for the neonates health care. Other professionals involved in the medical aspects of care are respiratory therapists and pharmacists. Nurses are the front line in providing care for neonates and implementing

care plans in the NICU Nursing practice in NICU consists of at least three elements: Implementing nursing therapy, assisting with medical care and collaborating with other health care providers. The interrelationship of these three components centers on providing or maintaining neonatal and family health (kaur, 2013).

Summary

Nursing care given for the neonates with RDS is assess the infant's response to respiratory therapy. Continuous monitoring and close observation are mandatory because a neonatal status can change rapidly. A breathing machine can be lifesaving, especially for babies with high levels of carbon dioxide, low blood oxygen in the arteries and low blood PH (acidity). However, continuous positive airway pressure (CPAP) can keep the airways open, so it is important that all babies with RDS receive excellent supportive care which include; gentle handling, maintaining body temperature and careful fluid management. The nurses have a key role to play in the care of high-risk and preterm infants, whereas nurses working in the NICU should be qualified and trained through ongoing education program. Therefore, it is necessary to assess the nurses' knowledge regarding neonate's RDS to improve their knowledge and prevent the RDS complications among Those neonates. Treatment of RDS is usually begins as soon as the baby is born, sometimes in the delivery room. Most neonates who show signs of RDS are quickly moved to a special intensive care unit called NICU, there, they receive treatment from a group of health care professionals who specialized in treating premature infants. The NICU is designed to limit stress on the baby and meet basic needs of warmth, nutrition, and protection. However, preventing prematurity is the most important way to prevent neonatal RDS throughout good prenatal care that results in healthier babies and fewer premature births. Additionally, avoiding unnecessary or poorly timed CS can also reduce the risk of RDS (Dorothy et al., 2010).

Chapter Three

Methods and Materials

This chapter presents the method of the study to answer the research questions. In this chapter different items were explained: study design, place of the study, study population sample size, sampling process, period of the study, inclusion and exclusion criteria, study tools, reliability, validity, pilot study, data collection, ethical and administrative consideration of the study.

3.1 Study Design

This is a quantitative descriptive analytic cross-sectional study conducted to assess nurses knowledge and practice regarding care of preterem neonates with RDS provided by nurses working in NICUs of the governmental hospitals at G.S. This design was suitable for the nature of the problem in this study, effective, less time and money consuming.

3.2 Sampling process and sample size

All nurses employed in NICUs of the governmental hospitals (Al Shifa - Al Nassr - Nasser hospital -European Gaza hospital) at G.S about 110 nurse “census sample”

3.3 Study population

The population of this study consisted of all nurses (110) employed in third level NICUs of the governmental hospitals (Al Shifa - Al Nassr - Nasser hospital - European Gaza hospital) at G.S

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3.4 Study setting

The setting of the study is NICUs in the governmental hospitals (Al Shifa - Al Nassr - Naser hospital - European Gaza hospital) at G.S these four hospitals have third level of NICUs, Al shifa and Nasser hospitals have maternity department and NICU department in the hospital, Al Nassr hospital covering the private sector and EGH have third level NICU which necessary to provide care and management for preterm neonate with RDS.

3.5 Study period

The study period was 9 months; from February 2019 to November 2019.

3.6 Eligibility criteria

3.6.1 Inclusion Criteria.

All nurses employed in NICUs of the governmental hospitals at G.S during the period of the study and who are willing to participate in the study.

3.6.2 Exclusion Criteria.

Other nurses in the selected hospitals who does not employed in the NICUs as well as nurse students and volunteers working in NICUs and nurses who refused to participate in the study.

3.7 Study instruments and tools

A self administered questionnaire constructed by the researcher based on the review of the literature and past experiences to assess the knowledge and practices of the nurses regarding care of preterm neonates suffering from RDS at governmental hospitals in G.S. The questionnaire validated by disseminating this questionnaire to a panel of experts. the

first part of the questionnaire covered the respondent's socio-demographic information which included: age, gender, academic level, job title, work place, work experience in NICU. In addition courses through the work in NICU, place of the course were received and period of the courses. As well special training for preterm care with RDS, place of the special training, period of special training for preterm with RDS care. Finally education and training programs in work place.

The second part of the questionnaire developed by the researcher to assess knowledge of the participants towards preterm neonate suffering from RDS care. It was composed of 18-item multiple-choice questions, each item in the knowledge section of the questionnaire had two possible responses, True or False. One mark awarded for every correct response, zero otherwise. The total score ranged from 0-18 and it was then converted into percentage. The higher scores indicated the higher level of knowledge.

The third part of the questionnaire developed by the researcher to assess practices of the participants towards preterm neonates suffering from RDS care. Each item in the practice section of the questionnaire had three possible responses, namely No never = zero, Sometimes = one and Yes always = two. The possible scores ranged from 0 - 42. These scores were then converted into a percentage. The higher scores indicated the higher level of practice.

Scoring of the questionnaire

knowledge part: (1) score for the correct answer, and (0) for the wrong answer. Calculation of mean score of knowledge (number of corrected answers divided by 18).

practice part: (2) scores for always, (1) score for sometimes, (0) for never, and calculation of mean score of practice (score for each item divided by 2) and the mean percent calculated as (mean score ÷ 2) x 100

3.8 Validity of the instrument

The constructed questionnaires were sent to six experts to validate the questions and its relation to the domains that reflect the study. Comments of the experts were considered and modification was performed accordingly.

3.9 Reliability

Reliability refers to the consistency of a measure. A test is considered reliable if we get the same results repeatedly. to measure the internal consistency of the instruments and to test reliability the researcher used Cronbache alpha method as presented in the table below.

Table (3.1): Reliability of knowledge and practice questionnaire

(Cronbache alpha coefficient)

No.	Domain	No. of items	Alpha coefficient
1	Knowledge	18	0.815
2	Practice	21	0.808

The value of alpha coefficient for the knowledge domain and practice domain was above 0.70, which means that the questionnaire has good reliability.

3.10 Pilot study

A pilot study has been conducted on 30 questionnaires in order to test reliability of its items and to identify the clarity or ambiguity of questionnaire items, to reduce the problems which may rise during data collection, to identify all domains and components of instrument and to determine the particular time needed to fill the questionnaire, the total 30 questionnaires were included in the study without any modifications.

3.11 Data collection

Data were collected by using self-administered questionnaires; to assess nurses knowledge and practices regarding care of preterem neonates with RDS provided by nurses working in NICUs of the governmental hospitals in G.S. The researcher distributed the questionnaires to the participants at the working hours in all shifts and then receiving them after completed. The average time for filling the questionnaire was 20 minutes. The covering letter of the questionnaire outlined the title and the purpose of the study and the identity of the researcher.

3.12 Response rate

The total number of target population was 110 subjects, with response rate 93.6%.

3.13 Data entry and analysis

The collected data entered into the computer software "Statistical Package for Social Sciences" SPSS program after coding of the questions and cleaning of the entered data. The collected data were analyzed by using the SPSS software program. After data entry and data cleaning, frequency distribution for all variables of the questionnaires were performed, then recoding for continuous variables. Simple statistics including frequencies were used, means and percentages. Also one way ANOVA test and (t) test were used.

3.14 Ethical and administrative considerations

The ethical, administrative considerations and procedures are very important conditions in applying the research. The researcher maintain all ethical and administrative requirements to conduct this study**.** Approval from the College of health professions at Al-Quds University, Helsinki Committee and General Directorate of Hospitals at the Palestinian MOH were obtained before conducting the study. Subjects under the study received guarantee of privacy and knew about voluntary participation.

Chapter Four

Results and Discussion

4.1 Introduction

This chapter presents the results of statistical analysis. The results are presented as descriptive and inferential results. Description of demographic characteristics of study participants was illustrated as well as the results of different variables were identified as inferential results. The results were presented in figures and tables.

4.2 Sociodemographic characteristics of study sample

Table (4.1): Sociodemographic characteristics of study participants (n= 103)

Variable	**n**	**(%)**
Gender		
Male	62	60.2
Female	41	39.8
Total	103	100.0
Age		
23 – 28 years	34	33.0
29 – 34 years	45	43.7
35 years and more	24	23.3
Total	103	100.0
Mean age = 31.582 SD = 5.836 years		
Job title		
Nurse	101	98.1
Head of department	2	1.9
Total	103	100.0
Experience in NICU		
Less than 5 years	54	52.4
5 – 10 years	35	34.0
More than 10 years	14	13.6
Total	103	100.0

NICU= Neonatal Intensive Care Unit

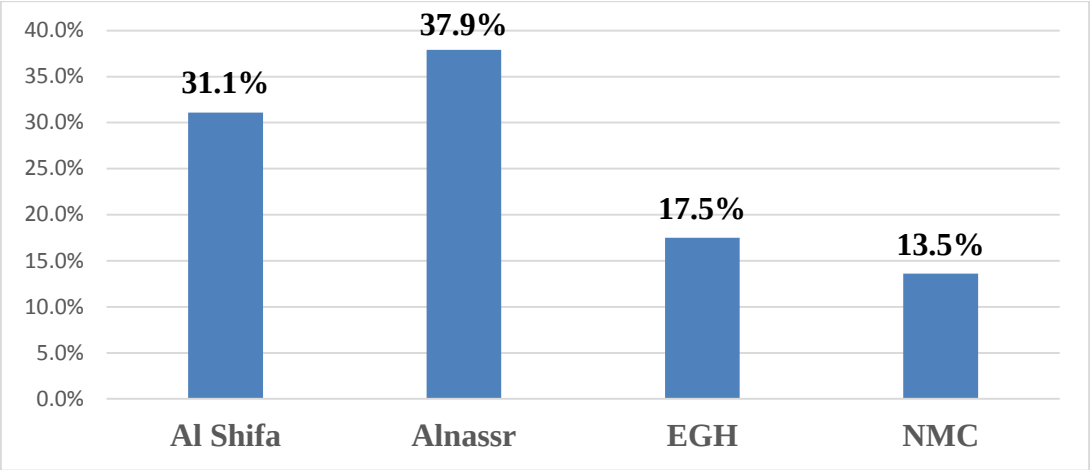
Table (4.1) showed that about two thirds (60.2%) of study participants are males and less than half (39.8%) are females. Also, the results showed that less than half (43.7%) of study participants aged 29 – 34 years, one-third 33% aged 23 – 28 years, with mean age 31.582±5.836 years, the majority (981%) are regular nurses, more than half (52.4%) have an experience of less than 5 years and one-third (34%) have an experience of 5 – 10 years.

Table (4.2): Distribution of study participants by training (N= 103)

Variable	Number	Percentage (%)
Received training during working in NICU		
Yes	60	58.3
No	43	41.7
Total	103	100.0
Length of training (n= 60)		
Less than one month	49	81.7
1 – 6 months	11	18.3
Total	60	100.0
Received specialized training about care of neonates with RDS		
Yes	36	35.0
No	67	65.0
Total	103	100.0
Does your hospital offer educational programs and training about care of		
Yes	64	62.1
No	39	37.9
Total	103	100.0

RDS= Respiratory Distress Syndrome

As shown in table (4.2), more than half (58.3%) of study participants received training during their work, most of training programs were less than one month, more than one-third (35%) received special training about care of neonates with RDS, and two-thirds (62.1%) stated that their hospital offer educational programs and training about care of neonates.



EGH= European Gaza Hospital NMC = Nasser Medical Complex

Figure (4.1): Distribution of study participants by hospital

Figure (4.1) showed that one-third (31.1%) of study participants are from Al Shifa hospital, more than one-third (37.9%) from al Nassr hospital, less than fourth (17.5%) from EGH, and less than fourth (13.5%) from Nasser Medical complex.

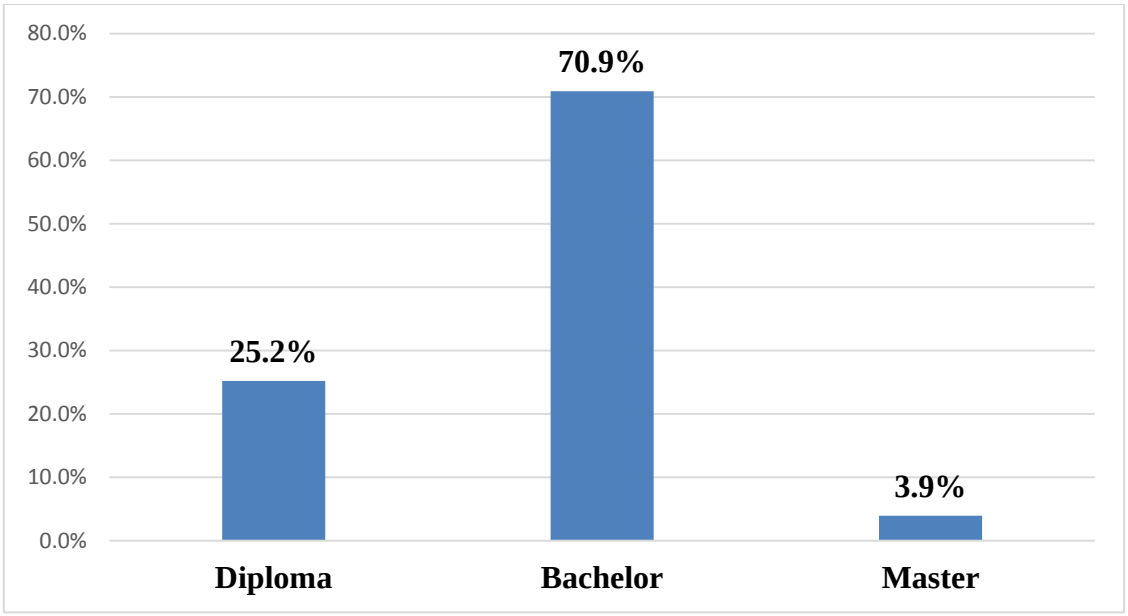


Figure (4.2): Distribution of study participants by qualification

Figure (4.2) showed that one-fourth (25.2%) of study participants have diploma degree, more than two-thirds (70.9%) have bachelor degree, and (3.9%) have master degree

4.3 Level of knowledge about Respiratory Distress Syndrome

To determine the level of nurses' knowledge about RDS, the researcher calculated frequencies and percentage of correct and wrong answers as illustrated in table (4.2).

Table (4.2): Knowledge of participants about care of neonates with RDS(n= 103)

No.	Item	Correct answer		Wrong answer	
		n	%	n	%
1.	RDS is a life threatening lung disorder	94	91.3	9	8.7
2.	RDS also known as hyaline membrane disease	81	78.6	22	21.4
3.	RDS results from insufficient levels of pulmonary Surfactant	93	90.3	10	9.7
4.	Respiratory failure characterized by severe dyspnea, hypoxemia, and diffuse bilateral infiltrates	94	91.3	9	8.7
5.	Preterm birth is the birth occurring before 37 completed weeks of gestation	94	91.3	9	8.7
6.	The single most important cause of morbidity in preterm neonates is RDS	93	90.3	10	9.7
7.	All of the following symptoms of RDS (cyanosis, apnea, fever, nasal flaring) usually appear within minutes after births except fever	86	83.5	17	16.5
8.	Nursing care of infant with RDS is demanding crucial part requiring alertness, skillful, and sensitive nurse	91	88.3	12	11.7
9.	NICU is a unit where high-risk neonates including preterm babies are cared for.	88	85.4	15	14.6
10.	Fetal lung maturity can be accelerated before delivery by maternal administration of dexamethasone	82	79.6	21	20.4
11	Care and management of preterm neonates with severe RDS in third level NICU	27	26.2	76	73.8
12	Nurses play an important role in caring for neonates with RDS including physical examination, count respiratory rate, and watch for severity of neonatal RDS	94	91.3	9	8.7
13	Risk factors of RDS includes selective cesarean section, and severe birth asphyxia	88	85.4	15	14.6
14	Nurse instruct the pregnant mother to reduce risk for having a neonate with RDS by following a healthy eating plan, avoiding tobacco smoke, alcohol, and illegal drugs, and preventing infections	92	89.3	11	10.7
15	Characteristics of preterm baby with RDS are dry, cracked, peeling skin, loose and wrinkled.	52	50.5	51	49.5
16	The primary route of preventing infection in preterm infant with RDS is hand washing	92	89.3	11	10.7
17	The first choice treatment after surfactant replacement is continuous positive airway pressure (CPAP)	41	39.8	62	60.2
18	Non-respiratory management of RDS include (temperature control , minimal handling, administration of oxygen, and antibiotics) except Administration of oxygen	45	43.7	58	56.3
Overall (Mean= 0.769 SD= 0.147)		**76.96%**		**23.04%**	

As presented in table (4.2), the overall average of knowledge among study participants about care of patients with RDS was (76.96), with total mean score 0.769 and SD 0.147.

4.4 Level of practice about RDS

Table (4.3a): Practice of participants about care of neonates with RDS (n= 103)

No	Item	Never		Sometimes		Always		Min	Max	Mean	SD	Mean %
		n	%	n	%	n	%					
1.	Elevate the head of the bed as needed to prevent aspiration	4	3.9	8	7.8	91	88.3	0	2.0	1.84	0.459	92.0
2.	Check oxygen humidifier chamber every shift	3	2.9	11	10.7	89	86.4	0	2.0	1.83	0.444	91.5
3.	Use only the percentage of oxygen necessary to relieve cyanosis	3	2.9	20	19.4	80	77.7	0	2.0	1.74	0.499	87.0
4.	Place monitor electrodes on the preterm with RDS on correct way	3	2.9	13	12.6	87	84.5	0	2.0	1.81	0.459	90.5
5.	Initiate basic neonatal resuscitation as needed until doctor arrive	3	2.9	21	20.4	79	76.7	0	2.0	1.73	0.504	86.5
6.	Participate in advance neonatal resuscitation in proper way	1	1.0	21	20.4	81	78.6	0	2.0	1.77	0.441	88.5
7.	Repeated suctioning of the pharynx secretions	9	8.7	26	25.2	68	66.0	0	2.0	1.57	0.650	78.5
8.	Do change position to neonate with RDS every two hours in NICU	4	3.9	27	26.2	72	69.9	0	2.0	1.66	0.552	83.0
9.	Provide too much oxygen to neonate with RDS without measure the Oxygen saturation	29	28.2	43	41.7	31	30.1	0	2.0	1.01	0.766	50.5
10.	Calculate of the medications carefully before given to the baby	2	1.9	16	15.5	85	82.5	0	2.0	1.80	0.444	90.0
11.	Observe the color of the baby frequently	3	2.9	8	7.8	92	89.3	0	2.0	1.86	0.421	93.0
12.	Warm objects contact with infants such as stethoscope	5	4.9	27	26.2	71	68.9	0	2.0	1.64	0.574	82.0
13.	Check the correct position of the NGT after insertion to prevent aspiration	6	5.8	24	23.3	73	70.9	0	2.0	1.65	0.589	82.5
14.	Elevating the head of the bed 30 degrees after feeding	8	7.8	29	28.2	66	64.1	0	2.0	1.56	0.636	78.0

Table (4.3b): Practice of participants about care of neonates with RDS (n= 103)

No	Item	Never		Sometimes		Always		Min	Max	Mean	SD	Mean %
		n	%	n	%	n	%					
15.	Maintain hydration by I.V fluids and feeding	2	1.9	32	31.1	69	67.0	0	2.0	1.65	0.518	82.5
16.	Perform hand washing before and after any contact with infant with RDS	4	3.9	12	11.7	87	84.5	0	2.0	1.80	0.486	90.0
17.	Regular cleaning or changing of humidifier water, IV tubes and Suction, respiratory and monitoring equipment	3	2.9	12	11.7	88	85.4	0	2.0	1.82	0.452	91.0
18.	Use sterile techniques with invasive procedures	0	0	16	15.5	87	84.5	0	2.0	1.84	0.364	92.0
19.	Explain baby condition to the parents to reduce their anxiety	3	2.9	54	52.4	46	44.7	0	2.0	1.41	0.551	70.5
20.	Wear personal protective equipment (gown, gloves etc.)	2	1.9	35	34.0	66	64.1	0	2.0	1.62	0.526	81.0
Overall		**4.7**		**22.0**		**73.3**		**0.7**	**2.0**	**1.68**	**0.262**	**84.0**

As presented in table (4.3 a, b), the overall practice of care for neonates with RDS was (mean score 1.68 and mean percent 84%).

4.5 Differences in knowledge, practice related to selected variables

4.5.1 Differences in knowledge, practice related to age

To find the differences in knowledge and practice in relation to age of nurses, the researcher used One way ANOVA test to examine the differences in the mean scores of knowledge and the mean score of practice between different groups of age as shown in table (4.5).

Table (4.4): Differences in knowledge and practice related to age (n= 103)

Variable		n	Mean	SD	F	P value
Knowledge	23-28	34	0.792	0.105	1.032	0.360
	29-34	45	0.770	0.166		
	35 and more	24	0.736	0.159		
	Total	103	0.769	0.147		
Practice	23-28	34	1.663	0.288	0.212	0.809
	29-34	45	1.691	0.251		
	35 and more	24	1.708	0.255		
	Total	103	1.686	0.262		

One way ANOVA test

Table (4.4) indicated that there were no statistical significant differences in levels of knowledge (P= 0.360) and practice (P= 0.809) of care for neonates with RDS related to age of the nurse.

4.5.2 Differences in knowledge and practice related to gender

To find the differences in knowledge and practice related to gender of nurses, the researcher used independent sample (t) test to examine the differences in the mean scores of knowledge and the mean score of practice between male and female nurses as shown in table (4.5).

Table (4.5): Differences in knowledge and practice related to gender (n= 103)

Variable	Gender	n	Mean	SD	T value[a]	P value
Knowledge	Male	62	0.774	0.134	0.380	0.705
	Female	41	0.762	0.166		
Practice	Male	62	1.642	0.280	-2.085	0.040 *
	Female	41	1.751	0.221		

*statistically significant at 0.05[a] independent sample (t) test

Table (4.5) showed that there were statistically no significant relationship between level of knowledge (P= 0.705) and gender, while significant differences existed in practice (P= 0.040), which means that female nurses had higher level of care of neonates with RDS compared to male nurses.

4.5.3 Differences in knowledge and practice related to qualification

To find the differences in knowledge and practice related to qualification of nurses, the researcher used One way ANOVA test to examine the differences in the mean score of knowledge and the mean score of practice between different qualifications as shown in table (4.6).

Table (4.6): Differences in knowledge and practice related to qualification (n= 103)

Variable		n	Mean	SD	F	P value
Knowledge	Diploma	26	0.737	0.188	1.120	0.330
	Bachelor	73	0.777	0.128		
	Master/PhD	4	0.833	0.163		
	Total	103	0.769	0.147		
Practice	Diploma	26	1.685	0.286	0.048	0.954
	Bachelor	73	1.684	0.258		
	Master/PhD	4	1.726	0.240		
	Total	103	1.686	0.262		

Table (4.6) showed that there were statistically no significant differences in knowledge (P= 0.330), and practice (P= 0.954) about care of neonates with RDS related to qualification of the nurse.

4.5.4 Differences in knowledge and practice related to job title

To find the differences in knowledge and practice related to job title, the researcher used Mann-Whitney test to examine the differences in the mean scores of knowledge and mean score of practice between head nurses and regular nurses as shown in table (4.7).

Table (4.7): Differences in knowledge and practice related to job title (n= 103)

Variable	Job title	N	Mean	SD	P value[1]
Knowledge	Regular nurse	101	0.770	0.147	0.841
	Head nurse	2	0.750	0.196	
Practice	Regular nurse	101	1.688	0.264	0.267
	Head nurse	2	1.547	0.168	

Mann-Whitney test[1]Exact significance is displayed for this test

Table (4.7) showed that there were no statistical significant differences in knowledge (P= 0.841) and practice (P= 0.267) of care for neonates with RDS related to job title of nurses.

4.5.5 Differences in knowledge and practice between hospitals

To find the differences in knowledge and practice between hospitals, the researcher used One way ANOVA test to examine the differences in the mean scores of knowledge and the mean score of practice between different hospitals as shown in table (4.8).

Table (4.8): Differences in knowledge and practice between hospitals (n= 103)

Variable		N	Mean	SD	F	P value
Knowledge	Al Shifa	32	0.753	0.140	0.958	0.416
	Alnassr	39	0.756	0.174		
	EGH	18	0.783	0.126		
	NMC	14	0.825	0.092		
	Total	103	0.769	0.147		
Practice	Al Shifa	32	1.561	0.212	4.713	0.004 *
	Alnassr	39	1.739	0.295		
	EGH	18	1.806	0.127		
	NMC	14	1.666	0.301		
	Total	103	1.686	0.262		

*statistically significant at 0.05

Table (4.8) showed that there were no statistical significant differences nurses' knowledge about care of neonates with RDS between hospitals (P= 0.416), but there were statistical significant differences in level of practice (P= 0.004).

Post hoc Tukey Honest Significant Difference (HSD) test showed that nurses from Al Shifa hospital expressed lower level of practice in care of neonates with RDS compared to nurses from EGH and Al Nasser hospital.

4.5.6 Differences in knowledge and practice related to experience in NICU

To find the differences in knowledge and practice related to experience in NICU, the researcher used One way ANOVA test to examine the differences in the mean scores of knowledge and the mean score of practice between different years of experience in NICU as shown in table (4.9).

Table (4.9): Differences in knowledge and practice related to experience in NICU (n= 103)

Variable		N	Mean	SD	F	P value
Knowledge	Less than 5 years	54	0.790	0.110	1.299	0.277
	5-10 years	35	0.755	0.186		
	More than 10 years	14	0.726	0.157		
	Total	103	0.769	0.147		
Practice	Less than 5 years	54	1.687	0.276	0.270	0.764
	5-10 years	35	1.666	0.258		
	More than 10 years	14	1.727	0.230		
	Total	103	1.686	0.262		

One way ANOVA test

Table (4.9) showed that there were no statistical significant differences in levels of knowledge (P= 0.277) and practice (P= 0.764) of care for neonates with RDS related to experience in NICU.

4.5.7 Relationship between knowledge, practice and training

To find the differences in knowledge and practice related to general training, the researcher used independent sample (t) test to examine the differences in the mean score of knowledge and the mean score of practice between nurses who received general training and nurses who did not receive training as shown in table (4.10).

Table (4.10): Differences in knowledge and practice related to training (n= 103)

Variable	Have you received training during your work	n	Mean	SD	T value	P value
Knowledge	No	43	0.806	0.119	2.168	0.032 *
	Yes	60	0.743	0.160		
Practice	No	43	1.737	0.193	1.817	0.072
	Yes	60	1.649	0.299		

*Significant at 0.05 Independent sample (t) test

Table (4.10) showed that there were statistically significant relationship between previous general training and levels of knowledge (P= 0.032) and nurses who did not receive training expressed higher knowledge than those who received training, while there were statistically no significant relationship between training and practice (P= 0.072).

4.5.8 Differences in knowledge and practice related to length of training

To find the differences in knowledge and practice related to length of training, the researcher used independent sample (t) test to examine the differences in the mean score of knowledge and the mean score of practice related to length of training as shown in table (4.11).

Table (4.11): Differences in knowledge and practice related to length of training (n= 60)

Variable	Length of training	n	Mean	SD	T value	P value
Knowledge	Less than one month	49	0.747	0.165	0.369	0.714
	1-6 months	11	0.727	0.139		
Practice	Less than one month	49	1.628	0.323	1.881	0.067
	1-6 months	11	1.740	0.123		

Table (4.11) showed that there were no statistical significant differences in levels of knowledge (P= 0.714) and practice (P= 0.067) of care for neonates with RDS related to length of training.

4.5.9 Differences in knowledge and practice related to special training on RDS

To find the differences in knowledge and practice between nurses who received special training and those who did not receive special training the researcher used independent sample (t) test to examine the differences in the mean score of knowledge and the mean score of practice related to receiving special training as shown in table (4.12).

Table (4.12): Differences between knowledge, practice and receiving special training on RDS (n= 103)

Variable	Trained on RDS	n	Mean	SD	T value	P value
Knowledge	No	67	0.776	0.139	0.681	0.498
	Yes	36	0.756	0.161		
Practice	No	67	1.717	0.274	1.687	0.095
	Yes	36	1.627	0.232		

Table (4.12) showed that there were no statistical significant differences in levels of knowledge (P= 0.498) and practice (P= 0.095) of care for neonates with RDS between nurses who received special training about RDS and those who did not.

4.5.10 Differences between knowledge, practice and hospital providing training

To find the differences in knowledge and practice related to training by hospital, the researcher used independent sample (t) test to examine the differences in the mean score of knowledge and the mean score of practice related to training by hospital as shown in table (4.13).

Table (4.13): Differences in knowledge and practice related to offering training by the hospital (n= 103)

Variable	Does your hospital offer training	n	Mean	SD	T value	P value
Knowledge	No	39	0.802	0.144	1.756	0.082
	Yes	64	0.750	0.146		
Practice	No	39	1.781	0.216	3.155	0.002 *
	Yes	64	1.628	0.273		

*statistically significant at 0.05 Independent sample (t) test

Table (4.13) showed that there were no statistical significant differences in knowledge (P= 0.082), while there were significant differences in practice (P= 0.002) of care for neonates with RDS, and that nurses who said that their hospital do not offer training had higher level of practice.

4.6 Discussion

Nursing care of infant with RDS requires alert, skillful and sensitive nurse. This study aimed to assess nursing care provided to preterm neonates with respiratory distress syndrome. Assessing neonates for signs of RDS is crucial at time of diagnosis and treatment. So, qualified, well-trained nurses can help preterm neonates recover from RDS and prevent complications (Lista et al., 2013). Therefore, assessing nurses' knowledge and the quality of their practice is essential to evaluate adequacy of their knowledge and practice, and highlights areas that need improvement.

The study included 103 nurses working in NICU at the big hospitals in Gaza governorates, namely Al Nassr pediatric hospital and Al Shifa hospital in Gaza, Nasser hospital and European Gaza Hospital in Khanyounis. More than two-thirds of study participants were from Al Nassr and Al Shifa hospitals, two-thirds of participants were male nurses, most of them have bachelor degree, more than three-fourth are young age of 34 years old and lower, and more than half of them have an experience of less than 5 years. Almost, similar characteristics reported by (Khoza, 2014) as most respondents were professional nurses (88.68%), working in NICU (80.77%), 24 (45.28%) had less than 5 years' and 29 (61%) of respondents have 6 or more years' working experience in NICU.

Another study found that 58.5% of nurses below 26 years old with mean age25.8 ± 4.3 years and 63.4% live in rural area. As regard years of experience in neonatal intensive care unit 39% of nurses, 48.8% of nurses has experience (Ahmed & Hani, 2017). Another study carried out by (Mahaling, 2015) found that themajority of the nurses were female, majority of the nurses belonged to the age group between 25-30 years, majority of the nurses have 3-4 years work experience, whereas more than 6 years work experience.

Furthermore, the majority of the nurses got information through continuing nursing education.

In addition, more than half of study participants received training during their work and the majority of training duration was less than one month. Also, more than one third of participants reported that they received special training about care of neonates with RDS, and two-thirds mentioned that their hospital offer training and educational programs to the nurses. Similar results obtained by (Tiryaki&Cinar, 2016, Loutfy et al., 2014, Elsayed et al., 2013) and as these studies examined nursing knowledge and quality of practice during care with RDS neonates and these studies found that educational interventions aimed at improving nursing knowledge and skills were very few in number. Another study indicated that 58.5% of nurses were below 26 years old with mean age25.8 ± 4.3 years and 63.4% live in rural area. As regard years of experience in NICU 39% of nurses, 48.8% of nurses has experience less than 5 years in other departments and 70.7% of nurses received previous training in neonatal care and 92.7% of nurses have satisfactory knowledge about hyperbilirubinemia (Ahmed & Hani, 2017).

The results reflected that NICU nurses expressed high level of knowledge in many aspects such as knowing that RDS is a life threatening lung disorder that results from insufficient levels of pulmonary surfactant, knowing the symptoms of RDS. Also, about half of the nurses expressed moderate level of knowledge and 40.8% expressed high level of knowledge. Generally, the results reflected a moderate level of knowledge about care of neonates with RDS, and raised the need to put a plan for improvement and increase their level of knowledge to higher levels.

This result was inconsistent with the results of Loutfy et al., (2014) and Elsayed et al., (2013) who found knowledge deficits among neonatal nurses who are taking care of

preterm neonates with RDS. In addition, they found that less than two-thirds of the nurses had poor level of knowledge. Moreover, other study consistent with the result of (Mahaling, 2015) found that the majority of nurses had moderate knowledge and the remaining 33.33% and 26.66% had good and poor knowledge score respectively.

Moreover, the results showed that nurses expressed high level of some aspects of practice including frequent observation the color of the baby, take measures to prevent aspiration, checking oxygen humidifire regularly, close monitoring of hemodynamics on monitors. The results indicated that the majority of nurses expressed high level of practice. This result was consistent with the results of Elsayed et al., (2013) who found that the majority of nurses had competent performance during their care for neonates' with RDS.In contrary, the results of this study were inconsistent with the results obtained by Loutfy et al., (2014) which found that more than half of the nurses had poor level of practice.

The study of Dames et al., (2016) founds relationship between knowledge and actions regarding the clinical management of neonates. It was found that nurses lack knowledge of the clinical management of pain, which is not a part of the daily neonatal care routine. They were also unaware of the application of rating scales for pain assessment.

A study conducted in Ethiopia found that among the total healthcare providers, who participated in the study, 64.8% had good knowledge and 59.8% had a good level of newborn care practice. Unavailability of adequate materials (like guidelines, drug, etc.) and training status were significant variables with knowledge and practice of newborn care (Tasew et al., 2019).

It is obvious to say that appropriate, safe, quality care is of great importance for the wellbeing and recovery of neonates with RDS in NICU and according to Batieha et al.,

(2016) about 60% of neonatal deaths are attributed to poor medical care. The results also showed no significant differences between knowledge and qualification of the nurse, and nurses from EGH and Al Nassr hospital exhibited higher level of Practice. On the other hand no significant differences existed between knowledge, practice and age of the nurse, gender, job title, experience, and previous training.

This result was consistent with the result of Capolingua & Gill (2018) which showed that those with postgraduate education had higher knowledge. In addition, the results of Baghlani et al., (2019) showed that significant differences in knowledge were found with regard to being married, having master degree, and employment experience.

Even though, our results did not find significant relatioship between training and levels of knowledge and practice, but other studies (Shrestha et al., 2013) suggested that periodic training and educational programs for neonatal nurses would enhance their knowledge and improve their skills (Brown et al., 2015; Kim et al., 2015).

In my opinion, results of this study were logic as nurses who are working in NICU are knowledgeable and skillful. This results is attributed to the fact that nurses who are working in NICU are selected carefully, qualified, with good abilities and skills. In addition, the study curriculum at colleges of nursing is of high standard, therefore, the graduates are of good quality and receive training that enable them to work in any nursing specialty. Moreover, in service training and continuous education plays a major role in improving nurses' knowledge and skills to maintain update with developments in nursing profession.

Chapter Five

Conclusion and Recommendations

This chapter provide the main conclusion and recommendations for the decision makers to focus on improving nurses care provided for preterm neonates with RDS in governmental hospitals.

5.1 Conclusion

This study aimed to assess nursing care provided for preterm neonates with RDS in governmental hospitals. It was aquantitative descriptive cross-sectional study

The study showed that the overall average of knowledge among study participants about care of patients with RDS was (76.96%), and the level of practicing care for neonates with RDS was (84%), in addition, the results indicated that there were statistically no significant differences between age, gender and job title of the nurses and their levels of knowledge and practice of care for neonates with RDS, there were statistically significant differences between qualification and levels of knowledge, as nurses who have master degree had higher level of knowledge compared to nurses who have bachelor and diploma certificate. In addition, there were statistically no significant differences between qualification and practice about care of neonates with RDS. Regarding the hospital there were statistically no significant differences between hospitals and nurses' level of knowledge, but there were statistically significant differences with level of practice and nurses from EGH expressed higher practice in care of neonates with RDS compared to nurses from other hospitals. And show that were statistically no significant differences between experience and previous training and levels of knowledge and practice of care for neonates with RDS, and

statistically no significant differences between offering training by the hospital and levels of knowledge and practice of care for neonates with RDS.

5.2 Recommendations

Based on findings of the current study, the researcher would emphasize many useful recommendations that may help in promoting and improving nursing care provided for preterm neonates with RDS as following:

- Nurses working in the NICUs need periodical training program to improve their knowledge and performance about care of neonates with RDS
- Standardized nursing procedures and guidelines should be available to guide the nurses in dealing with high risk neonates in the NICUs
- A periodic educational programs are needed to update the knowledge and practices for nurses working in NICUs
- Developing effective orientation program before starting work in NICU
- Further studies should be conducted to improve nurses' knowledge and performance regarding care of neonates with RDS in the NICUs.

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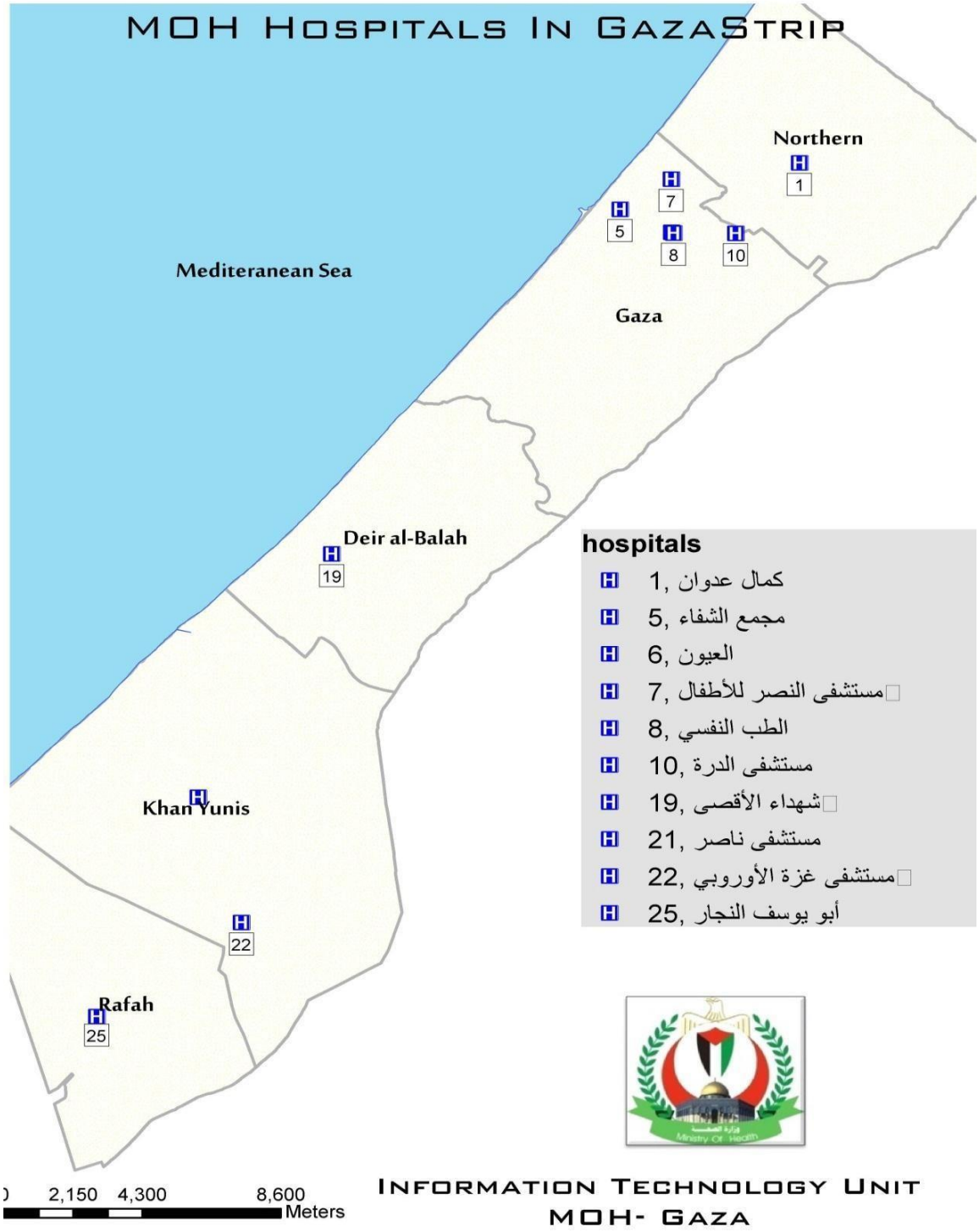
Annexes

Annex (1) Map of Palestine

Annex (2) MOH Hospitals in Gaza strip



Annex (3): Names of panels of experts

1. Dr. Hamza Abdeljawad (Al- Quds University - Gaza)
2. Dr. Osama Alean (Al- Aqsa University - Gaza)
3. Dr. Ahmed Najim (Al-Azhar University- Gaza)
4. Dr. Allam AbuHamda (Al Shifa Medical Complex)
5. Mr. Abdelmotalib El kahlout (Al Nassr Pediatric Hospital)
6. Dr.Hatem El dabakeh (Faculty of abilities Development)

Annex (4) Self-administered questionnaire

استبانة

Assessment of Nursing Care Provided for Preterm Neonates Suffering from Respiratory Distress Syndrome in Gaza Governorates

عزيزي/عزيزتي المشارك/ة

أنا الباحث/**هاني نعيم إبراهيم عوض** طالب ماجستير بجامعة القدس أبو ديس كلية المهن الصحية تخصص تمريض أطفال، أقوم بإجراء هذا البحث كمتطلب رئيسي من متطلبات الحصول على شهادة الماجستير .ان الهدف الرئيسي لهذه الدراسة هو تقييم الرعاية التمريضية المقدمة للأطفال الخدج الذين يعانون من متلازمة الضائقة التنفسية من وجهة نظر الممرضين والممرضات العاملين داخل أقسام العناية المركزة لحديثي الولادة في مستشفيات قطاع غزة الحكومية . أقدر مشاركتكم الهامة في هذه الدراسة والتي من الممكن أن تستغرق حوالي 20 دقيقة . مع العلم أن المشاركة اختيارية ولك حق الانسحاب متى تشاء مع ضمان سرية المعلومات المقدمة . وان هذا البحث لن يستخدم الا لأغراض البحث العلمي فقط .

يرجى إجابة جميع الأسئلة الواردة في الاستبانة وفقا لما لديك من معرفة وممارسة عملية .

ولكم جزيل الشكر والتقدير

الباحث/هاني عوض

جوال رقم :0599218365

1. Socio-Demographic Data

1. العمر: ..... سنة
2. الجنس □ ذكر □ أنثى
3. الدرجة العلمية □ دبلوم □ بكالوريوس □ ماجستير □ دكتوراة
4. الدرجة الوظيفية □ ممرض □ رئيس قسم □ مشرف تمريض
5. مكان العمل □ مستشفى الشفاء □ مستشفى النصر □ مستشفى الأوروبي □ مستشفى ناصر
6. سنوات الخبرة داخل قسم عناية الحضانة □ أقل من 5سنوات □ 5-10 سنوات □ أكثر من 10سنوات
7. هل حصلت على دورات تدريبية خلال عملك في قسم عناية الحضانة ؟ □ نعم □ لا

إذا كانت الإجابة " نعم " حدد الفترة الزمنية للدورة □ أقل من شهر □1-6 شهور □ أكثر من 6شهور

8. هل حصلت على تدريب متخصص في رعاية الأطفال الخدج الذين يعانون من متلازمة الضائقة التنفسية ؟

□ نعم □ لا

9. هل تقدم المستشفى التي تعمل فيها برامج تعليمية ودورات تدريبية فيما يخص الرعاية بالأطفال الخدج داخل عناية الحضانة ؟

□ نعم □ لا

2. Knowledge (please select one of the following)

1. Respiratory distress syndrome is:

A. A life threatening lung disorder

B. Non life threatening lung disorder

C. Non common breathing disorder

2. Respiratory distress syndrome (RDS) also known as :

A. Hyaline membrane disease

B. Lung membrane disease

C. I don't know

3. Respiratory distress syndrome result from insufficient levels of pulmonary :

A. Alveoli

B. Surfactant

C. Lobes

4. Respiratory failure characterized by :

A. Severe dyspnea

B. Hypoxemia

C. Diffuse bilateral infiltrates

D. All of the above

5.Preterm birth is :

A. The birth occurring before 39 completed weeks of gestation

B. The birth occurring after 37 completed weeks of gestation

C. The birth occurring before 37 completed weeks of gestation

6. The single most important cause of morbidity in preterm neonates is :

A. Respiratory distress syndrome (RDS)

B. Jaundice

C. Poor appetite

7.All of the following symptoms of RDS usually appear within minutes after births except :

A. Cyanosis

B. Apnea

C. fever

D. Nasal flaring

8.**Nursing care of infant with RDS is demanding crucial part requiring :**

A. Alertness
B. Skillful
C. Sensitive nurse
D. All of above

9. **Neonatal Intensive Care Unit(NICU)is:**

A. Unit where high-risk neonates including preterm babies are cared for.
B. Unit where non risk neonates including preterm babies are cared for.
C. Unit where full term neonates are cared for.
D. Non of the above

10. **Fetal lung maturity can be accelerated before delivery by maternal administration of :**

A. Prostaglandin
B. Dexamethasone
C. Adrenaline

11.Care and management of preterm neonates with severe RDS in :

A. First level of NICU
B. Second level of NICU
C. Third level of NICU

12. Nurses play an important role in caring for neonates with RDS including :

A. Physical examination
B. Count respiratory rate
C. Watch for severity of neonatal RDS
D. All of the above

13.Risk Factors of Respiratory Distress Syndrome includes:

A. Selective cesarean section
B. Severe birth asphyxia
C. Normal delivery
D. A and B

14.Nurse instruct the pregnant mother to reduce risk for having a neonate with RDS, she should to:

A. Following a healthy eating plan
B. Avoiding tobacco smoke, alcohol, and illegal drugs

C. Preventing infections
D. All of the above

15. Characteristics of preterm baby with RDS are:

A. Thin, shiny skin, excess lanugo hair & vernixcaseosa.

B. Dry, cracked, peeling skin, loose and wrinkled.

C. Non of the above.

16.The primary route of preventing infection in preterm infant with RDS is:

A. Hand washing

B. Prophylactic antibiotics

C. Alcohol use

17. The first choice treatment after surfactant replacement is:

A. Positive end expiratory pressure (PEEP)

B. Continuous positive airway pressure (CPAP)

C. Synchronized intermittent mandatory ventilation (SIMV)

18.Non-respiratory management of RDS include all of the following except:

A. Temperature control

B. Minimal handling

C. Administration of oxygen

D. Antibiotics

3. Practice

Read the following practice items and put (√) mark under the column of the options (No never, Some times, Yes always) you select according to what you do for each item. Only one option is possible for each question.(for preterm neonates with RDS).

No	Item of questions	Response rate		
		No, Never	**Sometimes**	**Yes,Always**
1.	Elevate the head of the bed as needed to prevent aspiration.			
2.	Check oxygen humidifier chamber every shift			
3.	Use only the percentage of oxygen necessary to relieve cyanosis			
4.	Place monitor electrodes on the preterm with RDS on correct way			
5.	Initiate basic neonatal resuscitation as needed until doctor arrive			
6.	Participate in advance neonatal resuscitation in proper way			
7.	Repeated suctioning of the pharynx secretions			
8.	Do change position to neonate with RDS every two hours in NICU			
9.	Provide too much oxygen to neonate with RDS without measure theOxygen saturation			
10.	Calculate of the medications carefully before given to the baby			
11.	Observe the color of the baby frequently			
12.	Warm objects contact with infants such as stethoscope			
13.	Check the correct position of the NGT after insertion to prevent aspiration			
14.	Elevating the head of the bed 30 degrees after feeding			
15.	Monitor infant temperature frequently			
16.	Maintain hydration by I.V fluids and feeding			
17.	Perform hand washing before and after any contact with infant with RDS			
18.	Regular cleaning or changing of humidifier water, IV tubes and Suction, respiratory and monitoring equipments			
19.	Use sterile techniques with invasive procedures			
20.	Explain baby condition to the parents to reduce their anxiety			
21.	Wear personal protective equipment (gown, gloves etc.)			

Annex (5): Helsinki committee for ethical approval

المجلس الفلسطيني للبحث الصحي

Palestinian Health Research Council

تعزيز النظام الصحي الفلسطيني من خلال مأسسة استخدام المعلومات البحثية في صنع القرار

Developing the Palestinian health system through institutionalizing the use of information in decision making

Helsinki Committee

For Ethical Approval

Date: 2019/10/7 **Number:** PHRC/HC/626/19 الاسم:

Name: Hani Naim Ibrahim Awad

We would like to inform you that the committee had discussed the proposal of your study about: نفيدكم علماً بأن اللجنة قد ناقشت مقترح دراستكم حول:

Nursing Care Provided for Preterm Neonates Suffering from Respiratory Distress Syndrome in Gaza Governorates

The committee has decided to approve the above mentioned research. Approval number PHRC/HC/626/19 in its meeting on 2019/10/7 و قد قررت الموافقة على البحث المذكور عاليه بالرقم والتاريخ المذكوران عاليه

Signature

Member

Member

Chairman

Dr. Yehia Abed

Genral Conditions:-

1. Valid for 2 years from the date of approval.
2. It is necessary to notify the committee of any change in the approved study protocol.
3. The committee appreciates receiving a copy of your final research when completed.

Specific Conditions:-

E-Mail:pal.phrc@gmail.com

Gaza - Palestine غزة - فلسطين

شارع النصر - مفترق العيون

Annex (6): Permission to collection data

State of Palestine
Ministry of health

دولة فلسطين
وزارة الصحة

السيد : رامي عيد سليمان العبادله المحترم

التاريخ:15/10/2019
رقم المراسلة 380458

مدير عام بالوزارة /الإدارة العامة لتنمية القوى البشرية ـ /وزارة الصحة

السلام عليكم ,,,

الموضوع/ تسهيل مهمة الباحث// هاني عوض

التفاصيل //
بخصوص الموضوع أعلاه، يرجي تسهيل مهمة الباحث/ **هاني نعيم عوض**
الملتحق ببرنامج ماجستير التمريض – تخصص الأطفال – جامعة القدس أبوديس في إجراء بحث بعنوان:ـ
"Assessment of Nursing Care Provided for Preterm Neonates Suffering from Respiratory Distress Syndrome in Gaza Governorates"
حيث الباحث بحاجة لتعبئة استبانة من عدد من الممرضين والممرضات مقدمي الخدمات التمريضية في أقسام الحضانة في المستشفيات (مجمع الشفاء الطبي، مستشفى النصر للأطفال، مستشفى غزة الأوروبي، مجمع ناصر الطبي)، بما لا يتعارض مع مصلحة العمل وضمن أخلاقيات البحث العلمي، ودون تحمل الوزارة أي أعباء أو مسئولية.
وتفضلوا بقبول التحية والتقدير،،،
ملاحظة /
- البحث المذكور حصل على موافقة لجنه اخلاقيات البحث الصحي (لجنة هلسنكي)

تسهيل المهمة الخاص بالدراسة أعلاه صالح لمدة 3 أشهر من تاريخه.

محمد ابراهيم محمد السرساوي
مدير دائرة/الإدارة العامة لتنمية القوى البشرية ـ

التحويلات

▪ محمد ابراهيم محمد السرساوي(مدير دائرة)	← رامي عيد سليمان العبادله(مدير عام بالوزارة)	إجراءاتكم بالخصوص(15/10/2019)
▪ رامي عيد سليمان العبادله(مدير عام بالوزارة)	← عبد السلام محمد عيد صباح(مدير عام بالوزارة)	إجراءاتكم بالخصوص(15/10/2019)
▪ عبد السلام محمد عيد صباح(مدير عام بالوزارة)	← محمد خليل محمد زقوت(مدير)	إجراءاتكم بالخصوص(15/10/2019)
▪ عبد السلام محمد عيد صباح(مدير عام بالوزارة)	← مصطفى سليم عبد الكحلوت(مدير مستشفى)	إجراءاتكم بالخصوص(15/10/2019)
▪ عبد السلام محمد عيد صباح(مدير عام بالوزارة)	← محمد محمد عبد الحليم ابوسلمية(مدير مستشفى)	إجراءاتكم بالخصوص(15/10/2019)
▪ عبد السلام محمد عيد صباح(مدير عام بالوزارة)	← يوسف فوزي اسماعيل العقاد(مدير مستشفى)	إجراءاتكم بالخصوص(15/10/2019)
▪ مصطفى سليم عبد الكحلوت(مدير مستشفى)	← وفاء يحيى محمد بنات(رئيس قسم اداري)	للإفادة(15/10/2019)
▪ محمد محمد عبد الحليم ابوسلمية(مدير مستشفى)	← حسن محمد خليل حافظ اللوح(مدير)	لعمل اللازم(15/10/2019)

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العنوان: تقييم الرعاية التمريضية المقدمة للأطفال الخدج الذين يعانون من متلازمة الضائقة التنفسية في محافظات غزة

إعداد: هاني نعيم عوض

إشراف: د. محمد الجرجاوي

الملخص:

الأطفال الرضع الخدج معرضون لخطر الإصابة بمتلازمة الضائقة التنفسية ، متلازمة الضائقة التنفسية الوليدية هي سبب رئيسي للمرض والوفاة عند الخدج. يتم تعريف متلازمة الضائقة التنفسية أو مرض غشاء الهيالين على أنه متلازمة ناجمة عن قصور في إنتاج المادة التي تساعد على نمو الرئتين مما يؤدي إلى عدم النضج الهيكلي في الرئتين عند الولادة مما يؤدي إلى انخفاض وظيفة الرئة. الهدف من هذه الدراسة هو تقييم المعرفة العلمية والممارسة العملية للممرضين والممرضات فيما يتعلق برعايتهم المقدمة للأطفال الخدج المصابين بمتلازمة الضائقة التنفسية في وحدات العناية المركزة لحديثي الولادة في المستشفيات الحكومية، وقد كانت الدراسة وصفية أجريت في وحدات العناية المركزة لحديثي الولادة في أربعة مستشفيات "مجمع الشفاء - مستشفى النصر للأطفال - مستشفى ناصر - مستشفى غزة الأوروبي" وتألفت العينة من جميع الممرضين و الممرضات العاملين في وحدة العناية المركزة في المستشفيات الحكومية. وكان العدد الإجمالي للممرضين 110، استخدم الباحث استبيانا ذاتيا لجمع البيانات من المشاركين في الدراسة لتقييم المعرفة للممرضين و الممرضات فيما يتعلق بالرعاية التمريضية المقدمة للأطفال الخدج الذين يعانون من متلازمة الضائقة التنفسية. كشفت نتائج الدراسة الحالية أن النسب المئوية للمعرفة كانت (76.96 ٪). ونسبة الرعاية العملية لدى المشاركين كانت (84٪) للأطفال المصابين بمتلازمة الضائقة التنفسية.

الخلاصة: خلصت الدراسة الحالية إلى أنه لم يكن هناك أي علاقة ذات دلالة إحصائية بين العمر والجنس والمسمى الوظيفي وخبرة الممرضين ومستويات المعرفة لرعاية حديثي الولادة المصابين بمتلازمة الضائقة التنفسية ، وفيما يتعلق بالمستشفى ومكان العمل ، لم يكن هناك إحصائياً أي ارتباط مهم بين المستشفيات ومستوى معرفة الممرضين ، ولكن كان هناك ارتباط معتد به إحصائياً مع مستوى الممارسة العملية فيما يتعلق برعاية الأطفال المصابين بمتلازمة الضائقة التنفسية. أوصت الدراسة بضرورة وجود برامج تعليمية وتدريبية لتحسين المعرفة العلمية والممارسة العملية للممرضين والممرضات حول الرعاية بالأطفال الخدج المصابين بمتلازمة الضائقة التنفسية في أقسام العناية المركزة لحديثي الولادة.