

## Nurses' Knowledge versus Their Performance in Caring for Neonates with Respiratory Distress Syndrome

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### ABSTRACT

Respiratory Distress Syndrome (RDS) is the most common neonatal emergency and the main cause of admission to neonatal intensive care units (NICUs). It is an acute lung disease that results from surfactant deficiency correlating with structural and functional lung immaturity. Assessment of the knowledge and close observation for the performance should be done for improving the neonatal nurses' quality of care during the care of neonates with RDS. **Aim of the study** was to assess nurses' knowledge versus their performance in caring for neonates with respiratory distress syndrome (RDS). **Research Design:** A descriptive correlational research design was utilized. **Setting:** The study was conducted at the Neonatal Intensive Care Units belonging to Ain-Shams University Hospitals, El-Fayoum University, General and Health Insurance Hospitals. **Subjects:** All nurses who cared for neonates with RDS, at NICUs in the previously mentioned settings comprised the subjects (N=60 nurse). **Tools for data collection:** A structured observation checklist to assess nurses' performance and structured questionnaire sheet to assess nurses' knowledge. **Results:** The study revealed that there were statistical significant differences between nurses' knowledge and their performance. Almost all the studied nurses had "poor" knowledge and "good" performance scores. **Conclusion:** The study concluded that nurses' performance didn't base on their knowledge. **Recommendations:** The study recommended continuous upgrading of neonatal nurses' knowledge and performance through application of in-service training program. Orientation programs for newly employee about care of neonates with respiratory distress syndrome are mandatory.

**Key words:** Nurses' Knowledge -Nurses' Performance -Neonates with RDS.

### INTRODUCTION

Neonatal respiratory distress syndrome (RDS) is a condition of pulmonary insufficiency that in its natural course commences at or shortly after birth and increases in severity over the first 2 days of life. It is due to lack of alveolar surfactant correlated to structural and functional lung immaturity and mainly confined to premature neonates. Clinically RDS presents with early RD, cyanosis, grunting, retractions, nasal

flaring and tachypnea. Respiratory failure may also develop (Davis & Henderson, 2010).

It occurs in approximately 5% of full term neonates and in over 50% of low birth weight and premature neonates. In fact, nearly all neonates born before 28 weeks of gestation develop RDS (Hintz et al., 2010). According to the study done in Maternity and Gynecological Hospital and Children's Hospital at Ain-Shams University, the RD occurs in 13.6% of live births and responsible

for 23% of neonatal mortality (**Sadek, 2010**).

In caring for neonates with RDS, the nurse is concerned with the complex problems related to respiratory therapy. Continuous monitoring and close observations are mandatory because neonates' status can change rapidly. Oxygen concentration is prescribed to neonates according to their blood gases measurements and pulse oximetry reading which are recorded at least hourly (**Vohr et al.,2010; Hockenberry et al., 2008**).

The competence of qualified and well trained neonatal nurses in the care of distressed neonates makes them not only excellent alternative care provider, but also they have knowledge and skills. The knowledge and skills make the neonatal nurses members of health care team, whose focus on the provision of high quality of nursing care (**World Health Organization, 2009**).

### **Significance of the study**

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The neonatal nurses' performance is usually influenced by their wide base of knowledge. So, assessment of the knowledge and close observations for the performance should be carried out for improving the neonatal nurses' quality of care for neonates with RDS.

### **Aim of the study**

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Assess nurses' knowledge versus their performance in caring for neonates with RDS.

### **Research Question**

Is nurses' performance based on their knowledge regarding the care of neonates with RDS?

### **Subject and Method**

#### **I. Technical Design**

**Research Design:** A descriptive correlational research design was utilized. **Setting:** The

study was conducted at the NICUs belonging to Ain-Shams University Hospitals and El-Fayoum University, General and Health Insurance Hospitals. **Subjects:** All nurses caring for neonates with RDS, at NICUs in the previously mentioned settings regardless to their age and qualifications comprised the subjects (N = 60 nurse).

#### **Tools for Data Collection**

**The following tools were used: A Structured Observational Checklist** for nurses' performance in caring for neonates with RDS. It was adapted from **Abdel Hameed (2010)**. Data collected were based on: performed, not performed or not applicable. **A Structured Questionnaire Sheet** to assess nurses' knowledge regarding care of neonates with RDS. It was developed by the researcher after reviewing the current available related literature and it was written in Arabic language to suit all nurses' categories. It consisted of three parts: **Part 1:** biosocial data for nurses as, nurses' age, level of education, years of experience and attendance of training programs about RDS, **Part 2:** nurses' knowledge about RDS as, definition, causes, manifestations and treatment, **Part 3:** nurses' knowledge about care provided to neonates with RDS. Knowledge was assessed based on the following: known or not known knowledge.

Tools content were validated by 5 experts in the field (pediatric nursing) and the validity value was 0.921. Tools reliability was ascertained using test-retest technique, accordingly no changes were done.

### **II. Operational Design**

#### **Preparatory Phase**

The researcher reviewed the current available related literature to be acquainted with the various aspects of the problem.

#### **Pilot study**

A pilot study was conducted on six neonatal nurses (10%) to test the clarity and

feasibility of the tools and to estimate the time consumed for each tool. Necessary modifications were done. These nurses were excluded from the study subjects.

### **Field Work**

The actual field work was carried out from the beginning of March 2012 till the end of October 2012. Each nurse was observed closely using the observational checklist for 6 hours shift, while she caring for neonates with RDS for five days (3 in the morning shift and 2 in the afternoon shift).

After finishing all the observations, the questionnaire was given to every nurse to obtain her knowledge regarding the care provided to neonates with RDS. The time spent to fill the sheet was around 45-60 minutes for each nurse.

### **Ethical Considerations**

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The research approval was obtained from the scientific research ethical committee in Faculty of Nursing Ain-Shams University. Written consent was obtained from nurses who agreed to participate, after a brief explanation about the aim of the study. They were assured about confidentiality of data collected and that data will only be used for the purpose of the study. They were informed that they have the right to withdraw from the study at any time without giving reason.

### **III. Administrative Design**

To carry out the study, the necessary approvals were obtained from hospitals directors as well as nursing directors to which settings are belonging. Formal letters were issued to them from the Dean of faculty of nursing explaining the aim of the study in order to obtain their cooperation.

### **IV. Statistical Design**

After data were collected, they were coded and transferred into specially

designed formats (Excel program) to be suitable for computer feeding. Frequency analysis and manual revision were used to detect possible errors. The Statistical Package for Social Science (SPSS) version 18.0 was utilized for both data description and statistical analysis of the results. Scores were used to evaluate nurses' knowledge and their performance regarding the care of neonates with RDS. The 0.05 level was used as the cut of value for statistical significance and the following statistical measures were used.

#### **A. Descriptive statistics**

1. **Number and percentage:** used for describing and summarizing categorical data.
2. **Arithmetic mean (x) and Standard deviation (SD)** were used as measures of central tendency and dispersion respectively.

#### **B. Analytical statistics**

Simple table, cross tabulation table, difference of two proportions test (Z-test) and difference of two means test (T-test).

#### **C. Graphical presentation**

Graphs were done for data visualization using Microsoft Excel.

### **Scoring System**

#### **A. Knowledge scoring system**

The total nurses' knowledge percentages were calculated for known and not known answers, according to the number of answers in each question. Each correct answer was given one mark and zero mark for wrong or not known answer. The total marks for nurses' knowledge were 74 mark distributed as follows: Oxygen therapy (OT) through nasal cannula or mask (11 Mark), care of neonates on nasal CPAP (14 Mark), care of

neonates on mechanical ventilator(23 Mark),taking capillary blood gases (CBGs)(18 Mark) and chest physiotherapy(8 Mark).

**B. Performance scoring system**

All the observations were calculated for the performed and not performed steps of each required procedures. Total number of procedures was 5 procedures. Each procedure had different total number depending on the number of steps in the procedure. Each correct step of performance was given one mark and zero mark was given for the step that didn't performed. Total marks =74 mark which were distributed as those in nurses' knowledge.

The total percentage of performance was calculated by summing the

percentages of all the required procedures throughout the study period (300 observations), and mean percentages were calculated for each procedure and for all the procedures. For the knowledge scores, the score was calculated only for the nurses who performed the procedure, using the Z-test to clarify the level of significant (0.5).

**Total scores of performance and knowledge were categorized as follows:**

- 70% and more were considered as "good" for both knowledge and performance.
- 50% - < 70% considered "fair" knowledge and "satisfactory" performance.
- < 50 % considered as "poor" knowledge and "unsatisfactory" performance.

**Result**

**Table (I):** Characteristics of the Studied Nurses

Characteristics	N n=60	%
<b>Age / years</b>		
<input type="checkbox"/> < 30	41	68.3
<input type="checkbox"/> 30-	14	23.3
<input type="checkbox"/> 40 and more	5	8.3
<b>Mean &amp;S.D</b>	<b>26.78 ± 7.41</b>	
<b>Level of education</b>		
<input type="checkbox"/> Bachelor Degree	13	21.6
<input type="checkbox"/> Technical Nursing Institute	14	23.3
<input type="checkbox"/> Diploma Degree	33	55
<b>Experience / years</b>		
<input type="checkbox"/> < 5	28	46.7
<input type="checkbox"/> 5	12	20
<input type="checkbox"/> 10 and more	20	33.3
<b>Mean &amp; S.D</b>	<b>7.57 ± 7.13</b>	
<b>Attending educational classes</b>		
<input type="checkbox"/> Yes	18	30
<input type="checkbox"/> No	42	70

- More than one answer.

**Nurses' Knowledge versus Their Performance in Caring for Neonates with Respiratory Distress Syndrome**

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**Table (II):** Nurses' Knowledge versus their Performance about Oxygen Therapy Administration through Nasal Cannula or Mask

Procedure	Performance		Knowledge		Z	P
	N n=32	%	N n=28	%		
- Washing hands.	13	46.2	9	32.1	7.7	0.000**
- Preparing equipment.	32	100	7	25	9.2	0.000**
- Selecting proper size of cannula or mask.	31	96.9	2	7.1	14.9	0.000**
- Connecting flow meter to either oxygen wall or freestanding tank.	32	100	4	14.3	13.0	0.000**
- Connecting humidifier to oxygen setup.	32	100	0	0	99.9	0.000**
- Attaching tubing to oxygen source.	32	100	4	14.3	13.0	0.000**
- Connecting distal end of oxygen tubing to delivery device.	32	100	7	25	9.2	0.000**
- Turning on flow meter to prescribed amount.	32	100	23	82.1	2.5	0.014*
- Checking flow of oxygen through the system by feeling it on hand.	30	93.8	0	0	19.1	0.000**
- Placing nasal prongs just inside external meatus of nose.	32	100	19	67.9	3.6	0.000**
- Placing oxygen over head of neonate; tighten straps attached to mask until it can easily fit one finger between straps and face of neonate.	32	100	1	3.6	27.5	0.000**

\* Significant at  $P > 0.05$

\*\* Significant at  $P > 0.01$

**Table (III):** Nurses' Knowledge versus their Performance about Care of Neonates on Nasal CPAP

Procedure	Performance		Knowledge		Z	P
	N n=75	%	N n=23	%		
- Hand washing.	71	94.7	0	0	15.5	0.000**
- Preparing equipment.	75	100	0	0	99.9	0.000**
- Measuring vital signs.	64	85.3	3	13	5.9	0.000**
- Auscultating breath sounds in all lung fields.	22	29.3	0	0	2.8	0.005**
- Checking humidifier temperature and level of distal water.	48	64	1	4.3	5.1	0.000**
- Suctioning airway every 2-4hrs., or on demand.	65	86.7	18	78.3	0.0	1.000
- Performing chest physiotherapy for all lung fields.	36	48	2	8.7	2.9	0.004**
- Changing neonate's position every 4hrs.	17	22.7	0	0	2.5	0.012*
- Caring for skin around nose, face and pressure area under nasal cannula (nasal septum and lips).	39	52	0	0	4.3	0.000**
- Recording:						
• Ventilator setting (Pressure-Flow-FIO <sub>2</sub> ).	75	100	0	0	99.9	0.000**
• Neonate's spontaneous breathing for:						
-Rate, rhythm and presence of retractions.	30	40	3	13.6	1.5	0.142
-Synchronization and chest movement.	5	6.7	2	9.1	0.0	1.000
• Level of consciousness.	40	53.3	0	0	7.3	0.000**
- Notifying any abnormality.	60	80	0	0	14.8	0.000**

\* Significant at P > 0.05

\*\* Significant at P > 0.01

**Nurses' Knowledge versus Their Performance in Caring for Neonates with Respiratory Distress Syndrome**

**Table (IV):** Nurses' Knowledge versus their Performance about Care of Neonates on Mechanical Ventilator

Procedure	Performance		Knowledge		Z	P
	N n=105	%	N n=25	%		
- Hand washing.	105	100	1	4	24.5	0.000**
- Preparing equipment.	105	100	0	0	99.9	0.000**
- Measuring vital signs:						
• Respiratory rate.	88	83.8	8	32	4.4	0.000**
• Heart rate.	94	89.5	5	20	6.6	0.000**
• Temperature.	86	81.9	5	20	5.9	0.000**
- Auscultating breath sounds in all lung fields.	10	9.5	0	0	1.5	0.142
- Checking humidifier temperature.	25	23.8	0	0	2.5	0.012*
- Checking level of distal water.	70	66.7	0	0	6.7	0.000**
- Changing neonate's position.	28	26.7	2	8.3	1.2	0.215
- Performing chest physiotherapy for all lung fields.	47	47.5	0	0	4.2	0.000**
- Suctioning:						
• Airway	97	92.4	18	72	1.9	0.057
• Endotracheal tube.	92	91.1	17	70.8	1.9	0.056
- Recording:						
• Ventilator setting (PIP, PEEP, Flow and FIO <sub>2</sub> ).	105	100	0	0	99.9	0.000**
• Neonate's spontaneous breathing for:						
- Rate, rhythm and presence of retractions.	55	54.5	0	0	5.3	0.000**
- Synchronization of chest movements.	0	0	0	0	-	-
• Breath sounds in all lung fields:						
- Aerations equal bilaterally.	0	0	0	0	-	-
- Louder breath sounds on the right lung.	0	0	0	0	-	-
- Bowel movements heard in chest.	0	0	0	0	-	-
• Intake and output.	96	95	0	0	23.5	0.000**
• Vital signs.	101	100	0	0	99.9	0.000**
• Endotracheal tube level at nose or mouth.	15	14.9	0	0	1.9	0.064
- Notifying for any abnormality.	92	91.1	0	0	16.2	0.000**

\* Significant at P > 0.05

\*\* Significant at P > 0.01

**Table (V):** Nurses' Knowledge versus their Performance about Taking Capillary Blood Gases (CBGs)

Procedure	Performance		Knowledge		Z	P
	N n= 90	%	N n=21	%		
- Washing hands.	30	33.3	3	15	1.5	0.134
- Preparing equipment.	46	51.1	6	30	1.3	0.190
- Selecting capillary puncture site (heel stick for neonates).	46	51.1	1	5	3.7	0.000**
- Wearing non sterile gloves.	5	5.6	0	0	1.0	0.308
- Warming selected foot or hand with a warm moist cloth and leave it 5 to 10 minutes.	2	2.2	2	10	0.6	0.549
- Removing warm cloth.	5	5.6	0	0	1.0	0.308
- Wiping selected site with antiseptic solutions.	37	41.1	4	20	1.4	0.159
- Allowing the site to dry.	37	41.1	0	0	3.7	0.000**
- Puncturing capillary site with sterile lancet at an angle so as, to cut more capillary beds and generate greater blood flow.	46	51.1	4	20	2.1	0.037*
- Holding capillary tube horizontally with dominant hands.	45	50	0	0	4.5	0.000**
- Filling the entire tube with blood and cap it.	46	51.1	4	20	2.1	0.037*
- Cleansing puncture site with cotton.	46	51.1	0	0	4.5	0.000**
- Applying adhesive bandage over area.	46	51.1	1	5	3.7	0.000**
- Placing sample in a laboratory specimen bag.	40	46	0	0	3.7	0.000**
- Labeling the bag properly.	40	46	0	0	3.7	0.000**
- Transporting it for analysis as soon as possible.	46	51.1	1	5	3.7	0.000**
- Disposing of used equipment and waste in appropriate waste container.	46	51.1	0	0	4.5	0.000**
- Washing hands.	29	32.2	1	4.8	3.2	0.001**

\* Significant at  $P > 0.05$

\*\* Significant at  $P > 0.01$

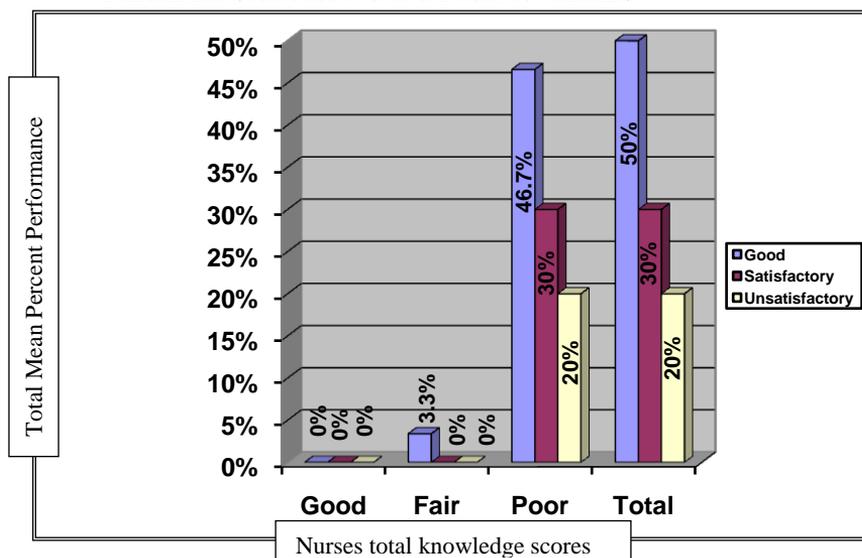
**Table (VI):** Nurses' Knowledge versus their Performance about Chest Physiotherapy

Procedure	Performance		Knowledge		Z	P
	N n=57	%	N n=14	%		
- Washing hands.	50	87.7	0	0	13.5	0.000**
- Preparing equipment.	50	87.7	0	0	13.5	0.000**
- Placing neonate in upright position.	50	87.7	0	0	13.5	0.000**
- Using mechanical precursor or with a cupped hand, percuss over the lung fields in a successive, rhythmic motion over each lung segment and in each position.	50	87.7	13	92.9	0.0	1.000
- After percussion is completed over each lobar area, vibration is done.	50	87.7	1	7.1	8.8	0.000**
- Shaking in a motion using, an open flat hand vibrates and loosens the secretions.	50	87.7	1	7.1	8.8	0.000**
- Performing suctioning as indicated.	50	87.7	7	50	2.9	0.004**
- Upon completion of therapy, returning neonate to position of comfort.	50	87.7	0	0	13.5	0.000**

\* Significant at P > 0.05

\*\* Significant at P > 0.01

**Figure (I):** Relation between Total Knowledge Scores of the Nurses with the Total Mean Percent Performance Scores about Care of Neonates with RDS



**Figure (4):** Nurses total knowledge scores versus their total mean percent performance scores

**Table (I)** shows characteristics of the studied nurses. It was found that the highest percentage of the studied nurses (68.3%) aged less than 30 years old while the lowest(8.3%)their age were above 40 years with mean age  $26.78 \pm 7.41$  years. Half of the nurses (55%) graduated from secondary nursing school, 21.6% have Bachelor degree and 23.3% have Technical Nursing Institute. Concerning years of experience, the highest percent (46.7%)of the nurses had less than 5 years, 20% had experience from 5 to 10 years with mean years of experience  $7.57 \pm 7.13$  years.

**Table (II)** represents nurses' knowledge versus their performance about OT administration through nasal cannula or mask. It was found that there were highly statistically significant differences between nurses' performance and their knowledge regarding all the steps of OT administration through nasal cannula or mask( $P < 0.0001$ ).

**Table (III)** portrays nurses' knowledge versus their performance about care of neonates on nasal CPAP. It is revealed from the table that there were highly statistically significant differences between nurses' performance and their knowledge in all the steps of the procedures except, suctioning airway every 2-4 hrs or on demand; recording respiratory rate (RR), rhythm and presence of retractions; and synchronization and chest movement.

**Table (IV)** clarifies nurses' knowledge versus their performance about care of neonates on mechanical ventilator. It is revealed from the table that there were highly statistically significant differences between nurses' performance and their knowledge regarding all the steps of care of neonates on mechanical ventilator ( $P < 0.0001$ ) except auscultating breath sounds in all lung fields, change neonate's position, recording level of endotracheal tube (ETT) at nose or mouth and suctioning airway and ETT.

**Table (V)** illustrates nurses' knowledge versus their performance about capillary blood gases (CBGs).It was found that there were highly statistically significant differences between nurses' performance and their knowledge regarding taking capillary blood gases (CBGs) at  $P < 0.0001$ .

**Table (VI)** shows nurses' knowledge versus their performance about chest physiotherapy. It was found that the differences between nurses' knowledge and their performance were statistically significant in all the steps except in using mechanical precursor or with a cupped hand, percuss over the lung fields in a successive, rhythmic motion over each lung segment and in each position.

**Figure (I)** illustrates the relation between the studied nurses' total knowledge scores and their total mean percent performance scores about care of neonates with RDS. It was found that although the majority of the nurses' total knowledge scores were "poor" about care of neonates with RDS (96.7%), yet half of the nurses had "good" (50%) and 30% had "satisfactory" in total performance scores.

## **Discussion**

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Nursing care of neonates with RDS requires knowledge and practical skills necessary for application of therapies directed toward many problems that may the neonates have. Lack of nurses' knowledge is one of the obstacles for delivery of standard nursing care needed for neonates with RDS (**Whitehead & Lacy-Haun, 2008**).

Providing a care to a neonate is a highly stressful situation that requires specific knowledge and skills to achieve optimal outcomes. More often, the performance of the neonatal nurses is influenced mainly by their wide base of knowledge (**Morton et al., 2012**).

The aim of this study was to assess nurses' knowledge versus their performance in caring for neonates with RDS. The current study was carried out on all the nurses who cared for neonates with RDS (60 nurse) at NICUs belonging to Ain-Shams University Hospitals, El-Fayoum University, General and Health Insurance Hospitals.

The major responsibility of the nurse when oxygen administration used, is to make certain that the equipment is functioning properly and to frequently assess the response of the neonates to O<sub>2</sub> treatment (**Sigillito & DeBlieux, 2003**). It was found in the current study that although almost all the nurses did all the steps of OT administration through nasal cannula or hood such as selecting proper size of cannula or mask and checking flow of oxygen through the system, none of the nurses mentioned these steps except turning on flow meter to prescribed amount and placing nasal prongs just inside external meatus of the nose where they were mentioned by the majority of the nurses. These results may be due to lack of basic knowledge as most of them are secondary school nursing graduates and they performed this procedure as a routine of care, as documented by the poor knowledge score of the majority of the nurses about OT administration. These findings were in agreement with the studies done by **Hassan (1993)** and **Abd El-Menem (2008)**, who found that the majority of the nurses had inadequate knowledge regarding their role during administration of OT. Also, **Abd El-Hameed (2010)** stated that less than half of the studied nurses had unsatisfied knowledge about oxygen therapy administration and the majority had satisfied performance. On the contrary, **Abd El-Aziz (2010)** found that one third of the nurses in her study had an average level of knowledge and two thirds had incompetent level of performance.

Nursing care of neonates having RDS and requires noninvasive nasal continuous positive airway pressure (CPAP) is considered as a nursing challenge. An understanding of the basic principles of noninvasive nasal CPAP system is important for providing optimal nursing care for those neonates and preventing the possible complications (**Kenner, 2007**). **Bonner & Mainous (2008)** stated that the nurse should take all the considerations to confirm proper fixation of the nasal prongs. Moreover, they added that airway obstruction by secretions, particularly mucous, is a common finding in neonates managed by noninvasive nasal CPAP. Regarding care of neonates on nasal CPAP, the findings of the present study illustrated that minority of the nurses stated that they should measure vital signs, check humidifier temperature and level of distal water, while, the nurses performed these steps in most of the observations. This finding was in agreement with the results of **MacMillan (2002)** who proved that the majority of staff nurses had low scores of knowledge related to care of neonates on non-invasive CPAP and contradicted with the findings of **Abd El-Menem (2008)** who found that the majority of the nurses had good knowledge and incompetent performance related to care of neonates on non-invasive nasal CPAP.

The results of care of neonates on nasal CPAP in the present study may be related to knowledge deficit, which is supported by their "good" performance scores and "poor" scores in their knowledge. In addition, it may be due to lack of understanding about how and when to convey practice into words, or due to inadequate supervision and absence of evaluation feedback.

Regarding care of neonates on mechanical ventilator, the present study shows that suctioning airway and ETT

were known to and performed by the majority of nurses. Moreover, none of the nurses knew that they have to auscultate breath sounds in all lung fields, check humidifier temperature and check level of distal water and the minority of the nurses performed them. This is supported by that all the nurses had "poor" knowledge scores and half of them had "unsatisfactory" performance scores. These findings were in agreement with the study done by **Sadek (2005) & Sadek (2010)** about nursing care of neonates with RD on mechanical ventilators who found that the majority of the nurses had poor knowledge regarding care of neonates on mechanical ventilators and incompetent performance. Also, **Kafil (2007)** who studied the nursing care given to terminally ill children in neonatal and pediatric ICUs found that approximately two thirds of the nurses were doing incompetent practice regarding routine care of neonates on ventilator.

The nurses' lack of knowledge about ventilator although they performed most of its steps may be due to the fact that nurses may think that the ventilator is a complicated vague part in the unit and it is the responsibility of doctors. Also, it may be due to lack of hospital standards guidelines focused on care of neonates on mechanical ventilators, or the complexity of the neonatal ventilation strategies that considered as a barrier that hindering the delivery of the standard nursing care. In addition, this may be due to lack of supervision and guidance as well as nurses' rounds which enhances nurses' knowledge through continuous education to nurses. Furthermore, it may be due to nurses' lack of in-service training and orientation programs as well as a manual guide for nurses about ventilators and how to operate them. Also, it may be due to the fact that the curriculum of the secondary nursing schools may not include ventilator and they learned about ventilator from their workmates who transferred the wrong

knowledge and experience from the old to new nurses.

**Verklan and Walden (2010)** stated that the nurses should take all precautions during taking capillary blood gases to reduce the risk of trauma. The findings of the present study indicated that nearly half of the nurses performed most of the steps of taking capillary blood gases although they didn't mention these steps such as, selecting capillary puncture site, filling the entire tube with blood and cap it, cleanse puncture site with cotton and puncture capillary site with sterile lancet at an angle. This finding may be due to the fact that the nurses were unaware of the complications of frequent improper drawing heel-stick sampling. Also, the nurses may be unaware of the necessity of selecting the puncture site. In addition, it may be due to the fact that in nursing curriculum may not include the nurses' role in ABG but on lab investigations. These results were supported by the results of **Sadek (2010)** who found in her study that the majority of the nurses had unsatisfactory knowledge and incompetent performance regarding applying precautions during taking capillary blood gases. Also she mentioned that the majority of the nurses didn't select the appropriate site for ABG. In addition, these results were incongruent to the results of **Sadek (2005)** who reported that more than two thirds of the nurses took capillary blood gases sampling (CBGs) incorrectly, **Abd El-Galil (2007)** who reported in her study regarding assessment of the quality of care in NICUs that none of the nurses achieved the desired level of performance and the minority of the nurses had a desired level of knowledge regarding taking capillary blood gases sampling.

Chest physiotherapy is usually required to expel secretions and help lung ventilation in neonates connected to mechanical ventilator for respiratory problems. Chest physiotherapy reduces the

rate of post extubation lobar collapse and need for re-intubation (Gray et al., 2005). The findings of the present study revealed that most of the nurses knew that they have to use mechanical precursor or with their cupped hand percuss over the lung fields and the majority of them performed it. This may be explained in the light of the fact that the nurses mentioned this most important step in the procedure as they performed it. On the other hand, although none of the nurse reported that they have to place neonate in upright position before percussion or place him in a comfortable position after physiotherapy, the majority of the nurses performed these steps. This may be due to the fact that the nurses used to position the neonates before and after suctioning as a part of routine step of the procedure and they may not take into their considerations to convey this routine into words. This may be also due to lack of in-service training programs to enhance their knowledge as most of the nurses didn't attend training programs. These results were in accordance with the results of Hassan (1993) and Abd El-Hameed (2010) who found in their studies that the majority of nurses did chest physiotherapy incompetent.

The relation between total knowledge scores of the nurses with the total mean percent scores of their performance about care of neonates with RDS revealed that although the majority of nurses' total knowledge scores were "poor" about care of neonates with RDS, yet, the majority of them had either "good" or "satisfactory" performance scores. This finding is congruent with Taha (1999) study finding about assessment of nurses' performance in premature units in selected Cairo hospitals and Sadek (2010) who reported that the majority of the studied nurses had "low" scores on their total knowledge and "incompetent" scores on their total performance. On the contrary, Abd El-

Hameed (2010) mentioned that only one fifth of the studied nurses had competent level of performance. In this respect, Gillies (2008) stated that practical knowledge is the knowledge of how to perform in the professional situations. Practical knowledge is hidden in the practitioner and cannot necessarily be expressed in words. The results of the present study may be due to the fact that nurses do their practices as a daily routine and neglect to update their knowledge which could also support and improve their performance. Furthermore, this may be due to the fact that most of the studied nurses had nursing diploma and didn't attend educational classes about RDS. Also, it may be due to the resistance of the nurses for change to upgrade their knowledge and lack of supervision in the NICUs. In addition, it may be due to the fact that the highest percentages of the studied nurses had less than five years' experience, which have an impact on their knowledge and accordingly their performance. It may also, due to the fact that the nurses have practical knowledge and they can't express this knowledge into words or they may not understand of how and when they apply the practice to knowledge.

## Conclusion

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The study concluded that nurses' performance didn't base on their knowledge. There were highly statistically significant differences between nurses' performance and their knowledge regarding all procedures about care of neonates with RDS.

## Recommendation

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The study recommended continuous upgrading of neonatal nurses' knowledge through application of instructional education program. Orientation programs for newly employee and on job training programs about care of neonates with RDS.

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## المخلص العربي

### معلومات الممرضات مقابل أدائهن في العناية بحديثي الولادة المصابين بمتلازمة الضائقة التنفسية

تعتبر متلازمة الضائقة التنفسية من أكثر الإضطرابات التنفسية شيوعا عند الولادة وتعتبر من الاضطرابات التي تهدد حياة حديثي الولادة. تعد من أكبر المشاكل الصحية التي يتعرض لها حديثي الولادة ذوي الحالات الحرجة. تعتبر متلازمة الضائقة التنفسية مرض رئوي حاد، ينتج عن نقص السيرفاكتانت في رئتي حديثي الولادة مرتبطا بعدم النضوج التكويني والوظيفي للرئة. ولذا فإنه يجب تقييم هذه المعلومات والملاحظة الجيدة لأداء الممرضات من أجل تحسين جودة الرعاية التمريضية لحديثي الولادة المصابين بصعوبة التنفس.

#### الهدف من الدراسة:

تقييم معلومات الممرضات مقابل أدائهن لرعاية حديثي الولادة المصابين بمتلازمة الضائقة التنفسية.

#### سؤال البحث :

هل أداء الممرضات مبني علي معلوماتهن عن رعاية حديثي الولادة المصابين بمتلازمة الضائقة التنفسية ؟

#### العينة وطرق البحث

تصميم البحث: إنه من البحوث الوصفية التحليلية

#### مكان الدراسة:

تم اجراء هذه الدراسة في وحدات العناية المركزة لحديثي الولادة في المستشفيات التالية: مستشفيات جامعة عين شمس ومستشفىالجامعة ،العاموالتأمين الصحي بالفيوم.

#### عينة الدراسة :

تشتمل عينة الدراسة على جميع الممرضات القائمات على رعاية حديثي الولادة المصابين بصعوبة التنفس في وحدات الرعاية المركزة لحديثي الولادة في الاماكن المذكورة سابقا (60 ممرضة).

#### أدوات البحث

استمارة ملاحظة لتقييم أداء الممرضات واستمارة استبيان معلومات الممرضات عن رعاية حديثي الولادة المصابين بمتلازمة الضائقة التنفسية

#### الاستنتاج:

نستنتج من الدراسة الحالية انممارسات الممرضات لا تعتمد علي أدائهن. وانه توجد فروق ذات دلالة احصائية عالية بين معلومات الممرضات وممارستن.

#### التوصيات:

توصي الدراسة بتحسين معلومات الممرضات من خلال تطبيق البرامج التعليمية المستمرة وبرامج التوعية الشاملة للممرضات حديثي التعيين بالإضافة الي البرامج الخاصة بالتثقيف المهني.