Nurses' Knowledge and Practices about Care of Neonates on Mechanical Ventilators with Respiratory Distress

[1]Wedad Mohamed Elsayed Hegazy, [2]Prof. Fawzia El Sayed Abusaad

[1](Member of the nursing development team at the Directorate of Health in Gharbia)
[2](Pediatric Nursing Department, Faculty of Nursing, Mansoura University, Egypt)

Abstract: **Respiratory distress remains a major source of morbidity and mortality among neonates. Mechanical ventilatory support is required for sever cases of neonates with respiratory distress in an attempt to mimic the respiratory system's physiological function of gas exchange until the respiratory system reaches maturation or recovered. Aim: to assess nurses' knowledge and practices about care of neonates on mechanical ventilators with respiratory distress. Methods: A descriptive research design was conducted on a sample of 68 nurse working in neonatal intensive care unit at El-Mhala general hospital. Two tools were used for data collection including questionnaire to evaluate nurse's knowledge regarding care of neonates with respiratory distress on mechanical ventilators, the second tool was an observational checklist to evaluate nurse's practice regarding care of neonates with respiratory distress on mechanical ventilators. Results: (64.7%) of the studied nurses had average level of knowledge compared to (20.6%) of them had good level of knowledge. While, (69.2%) had incompetent practical level compared to (30.8%) had competent practical level regarding care for neonates with respiratory distress on mechanical ventilation. Conclusion Relatively two thirds of the studied nurses had average level of knowledge & incompetent practice regarding care of neonates with respiratory distress on mechanical ventilators. Recommendations: In-service educational training programs directed toward all aspects of care for neonates with respiratory distress on mechanical ventilation should be established periodically for staff nurses working in neonatal intensive care units to improve their knowledge and practice.**

Keywords: **Knowledge, Mechanical ventilators, Nurses, Neonates, Practice, Respiratory distress.**

1. INTRODUCTION

The neonatal period (the first 28 days of life) conveys the most prominent dangers of death in the human life expectancy. Every year, an estimated 2.9 million babies die in this period, Around three fourths of these deaths occur in the first week of life, with the highest risk of mortality concentrated in the first day of life. Ninety-nine percent of neonatal deaths occur in low- and middle-income countries (**UNICEF, 2018).** Respiratory distress (RD) is a common presenting problem of neonates and the most important cause of neonatal morbidity and mortality globally and particularly in developing countries. It occurs in about seven percent of all newborns and is one of the commonest causes of neonatal intensive care unit (NICU) admissions worldwide accounting for about 30-40% of all admissions (**Christian & Hermansen, 2015).**

In Egypt, Aboufaddan and Abdelaziz (2018) in their study about respiratory distress and its outcome among neonates admitted to neonatal intensive care unit of Assuit university children hospital revealed that respiratory distress in neonates constitute 52.9% of total admission. As well as, Mohamed, Soliman and El-Asheer (2011) revealed that respiratory distress was the commonest primary diagnosis 94.5% among all admitted neonates, to neonatal intensive care unit in pediatric Assiut University Hospital. Moreover, a study of neonatal mortality in intensive care unit in children's hospital Cairo University revealed that mortality from respiratory distress among neonates comprise 26.7% of all deaths (**Zaman, Goheer & Riaz, 2013).**

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 6, Issue 1, pp: (223-231), Month: January - April 2019, Available at: www.noveltyjournals.com

Mechanical ventilator is a positive pressure breathing device by which air (or) oxygen mix is forced into the lungs, intermittently in a manner resembling normal breathing. In the neonate, mechanical ventilation is a measure for supporting pulmonary function until the neonate can breathe adequately without help. The purposes of mechanical ventilation are to facilitate alveolar ventilation and carbon dioxide removal, provide adequate tissue oxygenation and reduce the work of breathing. **(Neonatal Patient Care Teams, HSC & SBH, 2015)**

Caring neonates on mechanical ventilators presents special challenges to the nurse. The objective of nursing care for neonates with respiratory distress on mechanical ventilators is to maintain adequate ventilation and oxygenation by modifying the environment and managing the underlying problems. So it is necessary for pediatric nurses to understand the normal pulmonary physiology as well as the pathophysiology of pulmonary disease that cause neonatal respiratory distress. An understanding of the basic mechanical principles of various ventilators is important for providing optimal nursing care for those neonates **(Lissauer & Clayden, 2012). Significance of the study:** Nurses are constantly present at the neonate's bedside, so they are primary health care professional responsible for monitoring and addressing all neonatal needs. They are expected to keep an open eye on any equipment required by those critically ill neonates including ventilators and monitoring equipment. Evaluation of care provided by nurses to neonates with respiratory distress on mechanical ventilation help professionals to direct future nurse neonate interaction through identification of week points in the care admitted.

2. SUBJECTS AND METHOD

Research Design: A descriptive research design was used to conduct this study.

Study setting: This study was carried out in neonatal Intensive Care Unit at El-Mahala general hospital that affiliated to ministry of health and provides twenty four hours service not only to ill neonates but also to normal neonates requiring examination and observation from El-Mahala town and surrounding rural areas. The NICU consisted of 27 incubators, 9 mechanical ventilator machines distributed in 3 rooms.

Subjects: A convenience sample of nurses (68) working at the above mentioned setting who were providing care for neonates in neonatal intensive care unit regardless of their age and qualification or years of experience. While, five nurses not included in the study related to their recurrent absentee.

Tools of Data Collection:- The following two tools are used:

Tool (I): A structured questionnaire sheet: This tool was developed by the researcher after reviewing the related literature. It was divided into the following four parts:

Part 1: characteristics of the studied nurses including their age, level of education, previous training programs and years of experience at neonatal intensive care unit.

Part 2: Nurses' knowledge about mechanical ventilation including definition, indication, types, modes, parameters and complication of mechanical ventilation.

Part 3: Nurses' knowledge about care of neonates with respiratory distress including definition, causes, predisposing factors, signs and symptoms, management and complication of neonatal respiratory distress.

Part 4: Nurses' reported practices about care of neonates with respiratory distress on mechanical ventilator machine. It was included questions related to suctioning procedures, oral care, endotracheal tube care, nasogastric tube feeding, chest physiotherapy, dealing with ventilator alarms, and infection control measures. The questions were in the form of multiple choice questions and the answers were checked with model answer.

Scoring system: It was developed as the following: the complete correct answer was given the score (2), incomplete correct answer was given the score (1) and wrong or unknown answer was given the score (zero). The scores obtained for each question was summed up to get the total score for the nurses knowledge it was 54 items, the total score was computed out of (1.8 marks). According to **(Atwa, 2018), (Metwally, 2015) & (Suhara, Thomas, Chacko, et al, 2014)** The nurses knowledge level was categorized as following: good level of knowledge if the percent score was ≥ 75% (81 marks) and more, average level of knowledge from 50-<75% (54–81 marks) and poor if percent score was< 50% (54 marks)

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 6, Issue 1, pp: (223-231), Month: January - April 2019, Available at: **www.noveltyjournals.com**

Tool II: Observational checklists: Standardized checklists adopted after reviewing the related literature (Scanlan, Myslinski, 2017), (Kenna, Tiernan, KR/Team, et al. 2016) & (Bowden, Greenberg, 2015). This tool was used to assess nurses practice regarding care provided for neonates with respiratory distress on mechanical ventilation, which include suctioning procedure (oropharngeal (23 items), nasopharyngeal (24 items) and endotracheal(24 items)), securing of endotracheal tube (12 items), nasogastric feeding (21 items), dealing with ventilator alarms (5 items), oral care for ventilated neonates(15 items) and Chest physiotherapy (12 items)

Scoring system: Scoring system for observational checklist was developed; each step of the procedure scored on the bases of completely done scored (2), and incompletely done step scored (1)and not done scored (0), the total score was computed out of (242 marks). According to **(Elsayed, El-Nagger & Aly, 2013) & (Metwally, 2015)** The nurses level of practice was categorized as following: The level of nurses' practice was considered competent if the present score was ≥80% and more(≥194 marks), incompetent practice if the percent score was < 80% and less than(194 marks)

IV. Statistical design: The collected data were tabulated, coded and entered in a data based file using the excel program for windows. Frequency analysis and manual revision were used to detect any errors. Data were analyzed using the computer program SPSS (Statistical package for social science) version 23.0 to obtain. Qualitative data were described using the number and percentage. Association between categorical variables was tested using Chi-square test. Pearson correlation coefficient test was used correlating different parameters. Significance occurred when the probability of error is less than 5% (p value < 0.05) and highly significant occurred when the probability of error is less than 0.1 %(p value < 0.001).

3. RESULT

Table (1): Characteristics of the studied nurses in percentage distribution (no=68)

Nurse's characteristics		No	%
Age in years	20-<30	46	67.6%
	30-<40	22	32.3%
Educational level	Diploma	4	5.9%
	Technical institute of nursing	40	58.8%
	Bachelor degree of nursing	24	35.3%
Attendance of Neonatal care training programs	No	44	64.7%
	Yes	24	35.3%

It was revealed from table (1) that, two third of the studied nurses (67.6%) were in the age group from 20 to less than 30 years compared to less than one third (32.3%) of them were in the age group of 30 years to less than 40 years. While, more than half of the studied nurses had technical institute of nursing and did not attain any previous training programs about neonatal care (58.8% & 64.7% respectively) compared to (35.3%) of them had bachelor degree of nursing and attained previous training programs about neonatal care.

Table (2): Nurses' knowledge level about care of neonates with respiratory distress on mechanical ventilation in percentage distribution (no = 68).

Variable	Level of knowledge					
	Good		Average		Poor	
	No	%	No	%	No	%
1- Nurses, knowledge about neonatal respiratory distress	26	38.2%	37	54.4%	5	7.3%
2- Nurses, knowledge about neonatal mechanical ventilation	11	16.1%	33	48.5%	24	35.3%
3- Nurses' reported practical knowledge about suctioning neonates with respiratory distress on MV.	23	33.8%	36	52.9%	9	13.2%
4- Nurses, reported practical knowledge about oral care for neonates with respiratory distress on MV.	10	14.7%	19	27.9%	39	57.3%
5- Nurses, reported practical knowledge about endotracheal tube care for neonates with respiratory distress on MV.	35	51.4%	28	41.2%	5	7.3%
6- Nurses, reported practical knowledge about nasogastric tube						8.8%

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 6, Issue 1, pp: (223-231), Month: January - April 2019, Available at: www.noveltyjournals.com

feeding for neonates with respiratory distress on MV.	40	58.8%	22	32.3%	6	
7- Nurses' reported practical knowledge about chest physiotherapy for neonates with respiratory distress on MV.	15	22.0%	41	60.3%	12	17.6%
8- Nurses' reported practical knowledge regarding dealing with ventilator alarms.	2	2.9%	15	14.7%	56	82.4%
9-Nurses' reported practical knowledge about infection control measures for neonates with respiratory distress on MV.	38	55.8%	26	38.2%	4	5.8%

Table (2) indicates that, around half of the studied nurses had average level of knowledge regarding neonatal respiratory distress, neonatal mechanical ventilation, suction, and chest physiotherapy for neonates with respiratory distress on mechanical ventilation (54.4%, 48.5%, 52.9% & 60.3% respectively). While, more than half of them had good level of practical knowledge regarding endotracheal tube care, nasogastric tube feeding and infection control measures for neonates with respiratory distress on mechanical ventilation (51.4%,58.8% &55.8% respectively). However, most of the studied nurses had poor level of practical knowledge regarding oral care for neonates with respiratory distress on mechanical ventilation and dealing with ventilator alarms (57.3% & 82.4% respectively).
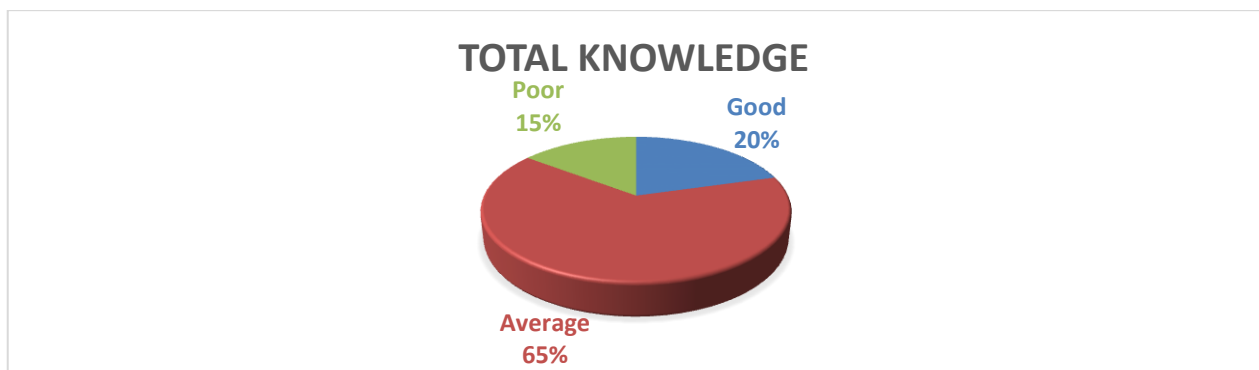

Figure (1): Total level of Nurses' knowledge about care of neonates with respiratory distress on mechanical ventilation.

Figure (1) illustrated that, less than two third (64.7%) of the studied nurses had average level of knowledge compared to less than fourth (20.6%) of them had good level of knowledge. While, the minority (14.7%) of them had poor level of knowledge regarding care of neonates with respiratory distress on mechanical ventilators.

Table (3): Nurses' practical level regarding items of care provided for neonates with respiratory distress on mechanical ventilation in percentage distribution (no= 68).

Nurses practice		Level of practice			
		Competent		incompetent	
		No	%	No	%
1- Suctioning procedure	Oropharyngeal Suction	25	36.8%	43	63.2%
	Nasopharyngeal Suction	23	33.8%	45	66.1%
	Endotracheal suction	14	20.5%	54	79.4%
2- Securing the endotracheal tube		30	44.1%	38	55.9%
3- Nasogastric tube feeding		36	52.9%	32	47%
4- Dealing with ventilator alarms		15	22.1%	53	77.9%
5- Oral care		11	16.1%	57	83.8%
6- Chest physiotherapy		8	11.8%	60	88.2%

Table (3) clarifies that, more than half of the studied nurses had incompetent practice regarding oropharyngeal and nasopharyngeal suction and securing the endotracheal tube (63.2%, 66.1% & 55.9% respectively). While, more than three fourths of them had incompetent practice regarding endotracheal suction, dealing with ventilator alarms, oral care and chest physiotherapy for neonates with respiratory distress on mechanical ventilation (79.4%, 77.9%, 83.8% & 88.2% respectively). However, approximately half (52.9%) of the studied nurses had competent practice regarding nasogastric tube feeding for neonates with respiratory distress on mechanical ventilation.

![Novelty Journals]

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 6, Issue 1, pp: (223-231), Month: January - April 2019, Available at: **www.noveltyjournals.com**
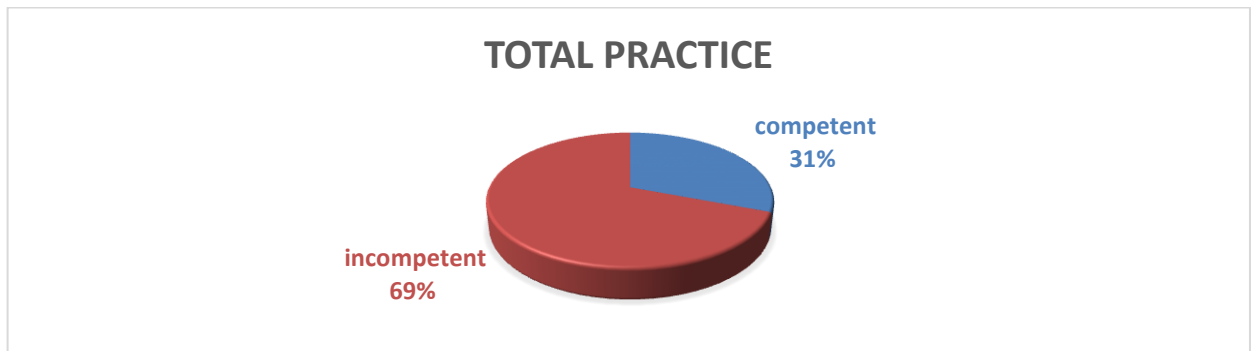
Figure (2): Total level of nurses' practice regarding care of neonates with respiratory distress on mechanical ventilation in percentage distribution (no = 68).

Figure (2) illustrates that, more than two thirds of the studied nurses (69.2%) had incompetent practical level compared to less than one third of them (30.8%) had competent practical level regarding care for neonates with respiratory distress on mechanical ventilation.
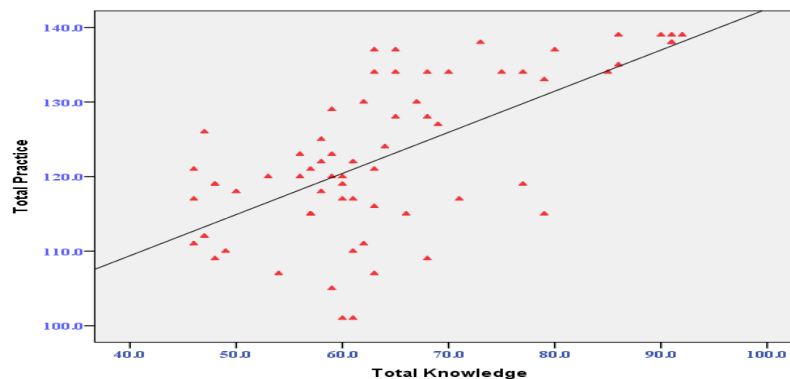
Figure (3): Correlation between total knowledge score and total practices score among the studied nurses.

Figure (3) showed that, there was a highly positive significant correlation between knowledge and practice of the studied nurses.

4. DISCUSSION

The findings of current study showed that, more than two thirds of the studied nurses were aged between 20 to less than 30 years old (table 1). this finding goes in the same line with **Elkazaz and Berma, (2017)** found that, more than two thirds of nurses being in the age group less than 30 years. Also, **Abd El-Aal, (2018)** who found that two thirds of the studied nurses ages was between 20 to less than 30 years old.

In relation to the studied nurses attainment of previous training courses, the present study revealed that, approximately of two thirds of the studied nurses did not attain any previous training courses related to neonatal care (table 1). The researcher expect from her point of view that this finding is due to large number of nurses are recently experienced at the neonatal intensive care unit and they haven't had the opportunity to attain training programs so far as will be demonstrated later. This finding is in an agreement with **Mohammed and Abdel Fattah, (2018)** who revealed that, two thirds had not attain any previous training courses. Similarly, **Abd El- Aal, (2018**) reported that, the majority of the studied nurses did not attain any previous training courses related to neonatal care.

The current study revealed that, around half of the studied nurses have average level of knowledge regarding neonatal respiratory distress and neonatal mechanical ventilation (table 11). As more than half of them report incorrect answers about definition of neonatal respiratory distress (table 2,3), definition, types of mechanical ventilator machine, function of intermittent mandatory ventilation and rang of peak inspiratory pressure setting. This finding may be due to more half of the studied nurses had technical institute of nursing and didn't attain any previous training programs about neonatal care.

The researcher believes that, level of nurses education affect their level of knowledge regarding neonatal respiratory distress and neonatal mechanical ventilation. On the contrary, **Abd El-Aal, (2018**) found that more than half of the studied nurses had poor level of knowledge about RDS preprogram implementation. However, this finding is supported by a study done by **Suhara, Thomas, Chacko, et al, (2014)** and proved that more than third were having average knowledge regarding mechanical ventilation. While the minority had good knowledge.

The existing study illustrated that, more than half of the studied nurses had average level of practical knowledge regarding suction and chest physiotherapy for neonates with respiratory distress on mechanical ventilation (table 11). As near half of them report incorrect answer or incomplete correct answer about rang of negative pressure needed for suctioning neonates, time of remining suction catheter inside the endotracheal tube, complication of incompetent suction procedure (table 4,8), precaution, contraindication, complication of chest physiotherapy for neonates. This finding may be owing to presence of a unique training team responsible for training all hospital departments whom more equipped by transferring information that concern patient care as general regardless the nature of patients in each department. The researcher suggests that setting up a special training team for neonatal intensive care unit may be helpful in upgrading nurses knowledge. This finding goes with **Aziz and Mansi, (2017)** who reported that nurses knowledge related to suction was average. The existing finding goes with, **Hassan, (2017)** who found that more than half of the studied nurses had average level of knowledge regarding chest physiotherapy.

Unfortunately, the present study stated that more than half of the studied nurses had poor level of practical knowledge regarding oral care for neonates with respiratory distress on mechanical ventilation (table 11). Most of neonatal nurses had reported using of saline as a mouth antiseptic wash solution. However, recent studies support and encourage the use of colostrum or maternal breast milk for oral care in order to gain its benefits and immune properties **(Lee, et al, 2015) & (Thibeau, Boudreaux, 2013)**. This finding may be related to absence of advanced protocol for oral care for neonates. In the same line, **Elbilgahy (2015**) and **Kandeel, Tantawy, (2012)** found in their studies that, there were variation in nursing practice toward oral care in the form of most of nurses use saline as a mouth wash solution. However, using saline should be limited due to its tendency to cause dryness. Also, this finding is in accordance with **Aziz and Mansi, (2017)** who revealed that nurse's knowledge related to oral care was poor.

In the present study, it was obvious that half of the studied nurses had good level of practical knowledge regarding endotracheal tube care (table 11). About half of them had reported correct complete answer about questions related to situations of insertion of endotracheal tubes and management during accidental extubation (table 6). This emergency situations require a team work to be managed, often more than one nurse and a doctor grouped together to resolve these problems quickly. The researcher believe that, actions that taken in emergency situations and require team work effort remind in nurses minds. This finding is supported by, **Ahmed, Mohamed, Mahmoud, et al. (2014)** who mentioned that majority of nurses was reported complete answers related to endotracheal tube care.

Concerning knowledge of nurses related to nasogastric feeding, the current study showed that, approximately two thirds of studied nurses had good level of practical knowledge (table 11). The researcher believe that this finding is owing to it is a routine care procedure done daily for most neonates even whose not on mechanical ventilation. Moreover nasogastric tube feeding is one of subjects that given by training team to all nurses in the hospital. This finding is in the consistence with **Al-hawaly, Ibrahim and Qalawa,(2016)** in his study about knowledge and performance regarding feeding neonates with nasogastric tube in Ismalia general hospital and found that nearly three quarter of the studied nurses had a satisfactory total level of knowledge regarding nasogastric tube feeding administrating.

In relation to nurse's level of practical knowledge regarding dealing with ventilator alarms, the present study clarified that more than three fourths of the studied nurses had poor level of practical knowledge (table 11). This finding may be due to more than half of nurses had technical institute, and a unique training team for all hospital departments who consists only of nurses whom more knowledgeable about patient nursing care, and not contain doctors whom more knowledgeable about dealing with ventilator machine by the nature of their work. Efforts must be made to achieve a high level of nurses' practical knowledge that allows nurses to fulfill needs for that vulnerable group. The researcher suggests that setting up a special training team for NICU consists of nurses and medical members to feed the nursing staff by more practical information. This finding is contraindicated with **Anyi, (2014)** who made a study about an assessment of the management of clinical alarms of the nursing care of critically ill patients at critical care unit, Kenyatta national hospital; university of Nairobi found that nurses have average knowledge related to dealing with ventilator alarms.

In the current study, it was obvious that more than half of the studied nurses had good level of practical knowledge regarding infection control measures (table 11). The researcher believes that, good level of nurses' knowledge regarding infection control may be owing to the presence of infection control team in the study settings whom regularly interview with nurses and educate them about infection control measures. This finding was agreed with **Shauq, Obaid, Zaid, et al (2014)** who concluded that most of nurses have acceptable level of knowledge regarding all aspects of universal precautions.

In relation to total level of nurses knowledge regarding care of neonates with respiratory distress on mechanical ventilation, near two thirds of the studied nurses had average level of knowledge (table 12) & figure 2). According to researcher expectation this finding is due to more than half of nurses had technical institute of nursing as well as not attain training programs about caring neonates with respiratory distress on mechanical ventilation. This finding is inconsistence with a study done by **Salem, (2005)** about care of neonates with respiratory distress on mechanical ventilators, faculty of nursing, Ain shams university and concluded that more than half of nurses had average knowledge, while few of them had good knowledge regarding care of neonates on mechanical ventilators.

The existing study illustrated that majority of nurses had incompetent level of practice regarding neonatal suction either orophayngeal, nasophryngeal or endotracheal suction (table 13). In the present study, observations for tracheal suctioning revealed that nurses did not adhere to best practice suction recommendations including hyper oxygenation before and after suctioning. As well as, limiting period of active suctioning to not exceed ten seconds. However, most of them had reported correct answer about these items in questionnaire format. These findings may be due to lack of nurses' knowledge about complications resulting from incompetent practice for suctioning procedure. The researcher believes that training nurses on the basis of evidence based practice will be helpful in improving their performance. This finding is supported by **Abd El- Aal, (2018)** who reported that all of nurses achieved incompetent practice regarding orophayngeal, nasophryngeal suctioning preprogram implementation.

The present study clarified that approximatly half of the studied nurses had competent practice regarding nasogastric feeding (table 13). According to the researcher point of view good level of nurses practical knowledge regarding nasogastric tube feeding for neonates affect positively their level of practice. in addition to, it is a routine procedure done daily for most neonates. This finding is align with **Elsayed, El-Nagger and Aly, (2013)** who stated that most of nurses had competent performance regarding nasogastric feeding.

The existing study showed that, more than three fourths of studied nurses had incompetent practice regarding dealing with ventilator alarms (table 13). The researcher believes that, this result may be owing to nurses' poor level of practical knowledge regarding dealing with ventilator alarms as clarified from questionnaire format. As lack of nurses knowledge is one of the obstacles to perform competent practice. This finding was in harmony with **Anyi, (2014)** who concluded that, nurses had incompetent practice regarding dealing with ventilator alarms.

Concerning nurses' practice regarding oral care for neonates on mechanical ventilators, the current study showed that, most of nurses had incompetent practice (table 13). During observation it was found that, majority of nurses used saline as a mouth antiseptic wash solution. Also, their documentation for oral care procedure in the neonatal file including only performance of the procedure without mention previous assessment of oral cavity. This finding related to lack of nurses knowledge about preferred using of fresh maternal milk for oral care as revealed from questionnaire sheet. The researcher believe that up to dating protocols for neonatal intensive care procedures may be helpful in improving nurses knowledge and practice. This finding goes with **Elbilgahy, (2015)** who stated that**,** there was lake of stander practice among nurses in performing oral care.

In the present study, it was obvious that, majority of the studied nurses had incompetent practice regarding performing chest physiotherapy for neonates with respiratory distress on mechanical ventilation (table 13). By observation it was found that most nurses just do percussion and not perform other essential components of chest physiotherapy including vibration and auscultating neonatal chest before and after the procedure. According to researcher own believe these findings related to lack of nurses knowledge as it was clarified from questionnaire format that, only one third of them reported correct complete answer about items of chest physiotherapy. This finding emphases that lack of knowledge may lead to incompetent practice. On contrary, **Elsayed, El-Nagger and Aly, (2013)** reported that, majority of nurses had competent practice regarding chest physiotherapy.

The existing study illustrated that more than two thirds of nurses had incompetent practice regarding caring neonates with respiratory distress on mechanical ventilation (table 14 & figure 3). The researcher believes that this finding may be due to training team in the hospital give oral lectures only without practical training for nurses and not follow the effect of training on their practice. Additionally, lack of knowledge, work over load, shortage of staff and absence of close supervision are probably resulting in incompetent nurses practice. This finding goes in the same line with **Salem, (2005)** who reported that**,** more than half of nurses had inadequate performance regarding their care of neonates on mechanical ventilators. As well as, **Elbilgahy, (2015)** who stated that**,** most of nurses had unsatisfactory practice preprogram implementation.

Concerning correlation between the studied nurse's total level of knowledge and their total level of practices about care of neonates with respiratory distress on mechanical ventilation, the current study illustrated that there was a highly positive correlation between knowledge and practice of the studied nurses (table 17& figure 4). Which reflects that the higher level of nurses knowledge lead to better level of practice, increase quality of care and improve neonatal outcome. This finding is supported by **Atwa, (2018)** who reported in his study that there was a positive correlation between knowledge and practice of the studied nurses about high frequency oscillatory ventilation.

5. CONCLUSION

Based on the findings of the current study, It was concluded that, near two third of the studied nurses had average level of knowledge. While less than fourth of them had good level of knowledge regarding caring of neonates with respiratory distress on mechanical ventilators. Also, more than two thirds of the studied nurses had incompetent practice. While less than one third of them had competent practice regarding caring of neonates with respiratory distress on mechanical ventilators. There was a statistical significant difference between nurses' level of knowledge and their age, educational level, attaining a training programs and years of experience. As well as, there was a statistical significant difference between nurses' level of practice and years of experience. Furthermore there was a highly positive correlation between knowledge and practice of the studied nurses.

6. RECOMMENDATIONS

Based on the results of that study, the following recommendations are suggested:

1. Periodical in-service training programs for staff nurses working in the neonatal intensive care units directed toward all aspects of care provided to neonates on mechanical ventilation.

2. Provision of adequate supervision of nurses during their practice and providing teaching on spot with motivation and feedback.

3. Further studies should be conducted to improve nurses' knowledge and performance regarding caring of neonates on mechanical ventilation.

REFERENCES

[1] Abou-Faddan, H., & Abdelaziz, N. (2018). Respiratory Distress and Its Outcome among Neonates Admitted to Neonatal Intensive Care Unit of Assiut University Children Hospital, Egypt. The Egyptian Journal of Community Medicine, 36(2),69-78.

[2] Christian, L., & Hermansen, M. D. (2015). Newborn Respiratory Distress. Am Fam Physician, 92 (11), 994-1002.

[3] Atwa, S. (2018). Nurses' Knowledge and Practice towards High Frequency Oscillator Ventilation in Pediatric Intensive Care Unit. Mansoura university, Egypt,79

[4] Abd-Aal, N. (2018). Effect of self-development program on nurses performance regarding quality standers of neonatal care. Mansoura university, Egypt, 139.

[5] Aziz, A. R, & Mansi, Q. H. (2018). Assessment quality of nursing care provided to neonates with respiratory distress syndrome at intensive care unit in Al-Nasiriyah city hospitals. Kufa journal for nursing sciences, 7 (2), 60 - 66.

[6] Ahmed, R., Mohamed, A., Mahmoud, F., & Zaki, A. (2014). Quality of Nursing Care Provided for Neonates with Tracheoesophageal Fistula. Journal of Education and Practice, 5 (3), 186-196.

[7] Elbilgahy, A. (2015). Prevention of pediatric ventilator associated pneumonia at pediatric intensive care unit: effect of implementing training program for nurses. Mansoura University, Egypt, 104

[8] Elsayed, L. A, El-Nagger, N. S., Aly, S. M. (2013). Nursing care provided for neonates with respiratory distress syndrome in the neonatal intensive care units at Makkah al-Mukkarramah in Saudi Arabia. Life Science Journal-Acta Zhengzhou university Overseas Edition, 10 (1), 3403- 3412

[9] Elkazaz, R.H., Berma, A. E. (2017). Stress and self-efficacy among nurses in neonatal intensive care units, International journal of research, Granthaalayah, 5 (2), 237- 251.

[10] Lee, J. (2015). Oro-pharyngeal colostrum administration in extremely premature infants: an RCT., Paediatrics, 135 (2): 357-366

[11] Mohammed, A., Abdel Fattah, S. (2018). The effect of educational program on nurse's knowledge and practices about nasogastric tube feeding at neonatal intensive care units. Ain Shams University, Cairo, Egypt ,Journal of Nursing Education and Practice, Vol. 8, No. 8

[12] Suhara,F., Thomas, J., Chacko,J., Varghese,G., Dharmarajan,B.,(2014). Assessment of knowledge regarding mechanical ventilation among stuff nurses working in selected hospital, Mangalore with a view to develop an information pamphlet. International Journal of Recent Scientific Research,Vol. 4, Issue, 9, pp.1410- 1413

[13] UNICEF (2018): neonatal mortality. Available at https://data.unicef.org/topic/child-survival/neonatal-mortality/

[14] Zaman, S., Goheer, L., & Riaz, H. (2013). prevalence and etiology of respiratory distress in neoborns. A Journal of Army Medical, vol 63, no 1