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Quality of Nursing Performance regarding Oxygen Administration for High Risk Infant

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ABSTRACT

Background: Oxygen is one of the most necessary components of life, so the nurses must be familiar with its administration and its potential hazards. Oxygen administration is useful when it is performed with the proper amount, but incorrect usage and inadequate practices of oxygen administration may lead to complications associated with increased morbidity and mortality. **Aim of the study:** This study aimed to assess quality of nursing performance regarding oxygen administration for high risk infant. **Design:** A descriptive cross sectional study was utilized for the current study. **Setting:** This study was conducted at the neonatal intensive care unit and pediatric intensive care unit at Beni-Suef University Hospital affiliated to Ministry of Higher Education. **Sample:** A purposive sample of 80 nurses working in the previously mentioned setting was included in the study. **Tools:** Three tools. The first tool was a structured interviewing questionnaire to assess nurses' knowledge regarding oxygen administration; the second tool was an observational check list to assess nurses practice regarding oxygen administration and the third tool was attitude scale to assess nurses' attitude toward oxygen administration. **Results:** The study findings revealed that 53.75% of the studied nurses had a good level of total knowledge regarding oxygen administration for high risk infant, while 65% of the studied nurses had a competent level of total practice regarding oxygen administration for high risk infant and 66.25% of the studied nurses had a positive attitude regarding oxygen administration for high risk infant. **Conclusion:** it can be concluded that, the majority of the studied nurses had a good level of knowledge, a competent level of practice, and a positive attitude regarding oxygen administration. **Recommendation:** The study recommended that upgrading nurses' performance through the continuous application of an education program for nurses about oxygen administration.

Key words: High Risk Infant, Nursing Performance, Oxygen Administration, Quality.

INTRODUCTION

The human body is reliant on oxygen for its survival. Every tissue and organ of the body needs oxygen for its effective functionality. For instance, the human brain requires 20% oxygen at rest. The oxygen from the air enters our lungs each time we breathe and travels via the vasculature of the alveoli to the bloodstream

(Demilew et al., 2022). Red blood cells bind oxygen in the blood and carry it to the tissues. The tissues and organs' oxygen content supports the synthesis of energy through a variety of direct and indirect routes. In a situation when end organs do not receive enough oxygen, develop a condition called hypoxia, which causes suboptimal cellular function (Jha& Gaur, 2022).

Because many disorders affect newborns in the first few days of life can induce low oxygen levels in the body, oxygen supplementation is crucial in the treatment of newborn infants. Low blood oxygen levels, or hypoxemia, are a potentially fatal illness raises mortality and morbidity rates. Hypoxemia can be brought on by hypoxia, pneumonia, other serious infections, premature birth, respiratory distress syndrome (surfactant deficit), asphyxia, and problems with the transition from fetal to neonatal life (Schmidt&& Kirpalani, 2022).

High risk infants defined as infants have a greater chance of mortality or morbidity due to disorders associated with birth and the adaptation to extrauterine life, regardless of gestational age or birth weight. High-risk infants have physiological handicaps affect extrauterine life adjustment. Physiological handicaps include reduced control of body temperature due to an immature hypothalamus center controlling body temperature, a deficiency of subcutaneous fat, and large surface area exposure. Difficult respiration is caused by weak respiratory muscles and surfactant deficiency, an immature immune system, impaired renal function, and a high tendency to hemorrhage (Khadivi et al., 2022).

When the extrauterine environment causes multiple adaptations affecting the morphophysiological and biochemical maturation of the lung parenchyma, a physiological and/or hemodynamic imbalance arises in high-risk infants. Respiratory failure can be caused by a variety of circumstances, including low muscle strength, lack of surfactant, high chest wall compliance, incapacity to breathe effectively, and a weak respiratory drive. Due to such factors, oxygen administration is necessary for high-risk infants in order to attain and/or modify gas exchange and create stable functional residual capacity (Litt et al., 2021).

The term quality is a vital component of current hospital and health care policies because it mainly reflects the desired patient outcomes. Two well accepted definitions describe quality in health care (Karthika et al., 2021). The first was put forward by the National Academy of Medicine (previously known as the Institute of Medicine of the National Academy of Sciences), which defined quality health care as safe, effective, patient centered, timely, efficient, and equitable. The second definition was given by the Agency for Healthcare Research and Quality, which defined health care quality as doing the right thing for the right patient at the right

time in the right way to achieve the best possible results (Stavropoulou et al., 2022).

Providing supplemental oxygen to high risk infants is an essential part of infant care, as it aligns with the fundamental responsibility of nurses to ensure infant comfort and well-being. In it context, having the necessary knowledge, demonstrating perceptive practice, and maintaining positive attitudes regarding oxygen administration are crucial elements in providing effective care in such an area (Bakare et al., 2020). By acquiring such skills, nurses can effectively evaluate the condition of high risk infants and provide personalized care tailored to each infant, thereby enhancing quality of life. Its approach also helps in preventing hypoxemia and acute lung injury (Younas et al., 2023).

Nurses play a very important role while administering oxygen therapy because the nurses should monitor infants linked to oxygen therapy carefully and regularly. Initial investigations such as ABG, Hgb, or Hct and an x-ray of the chest should be taken on a regular basis and evaluated carefully based on a physician's recommendation (Demilew et al., 2022). Pulse rate, blood pressure, respiratory rate, level of consciousness, and pulse oximetry must all be monitored. The nurses should be aware of the physician's prescription for oxygen therapy and check it in, which should include an indication, target oxygen level, oxygen delivery system, range of oxygen flow or percentage of inspired oxygen, and when oxygen is to be administered (Zeleke & Kefale, 2021).

Significance of the study

Oxygen (O2) is essential to life, but as a drug, it has a maximum positive biological benefit and accompanying toxicity effects. Oxygen is therapeutic for the management of hypoxemia and hypoxia associated with several pathological processes. When administering supplemental oxygen to treat hypoxemia associated with acute and chronic conditions, O2 toxicity from overexposure may be present (Kaltsogianni et al.,2022).

According to the Vermont Oxford Network (VON), 95% of extremely preterm newborns at or before 30 weeks' gestation got oxygen treatment in 2016 (Saad et al.,2022). In Egypt 15% of high risk infant undergoing oxygen therapy have potentially dangerous side effects as severe retinopathy of prematurity (ROP), blindness, other adverse effect on brain and finally may lead to death this occur as result of oxygen administration by inappropriate manner and concentration (Moore et al.,2018) and (Mohamed, 2021). Previous literature stated that nurses need more training in oxygen treatment and that suitable guidelines to guide oxygen therapy should be developed. Therefore, this study aimed to assess quality of nursing performance for oxygen medical aid to improve nurses' performance and infant health outcomes.

AIM OF THE STUDY

This study aimed to assess quality of nursing performance regarding oxygen administration for high risk infant.

Research questions:

The present study was intended to answer the following questions:

1- What is the nurses' level of knowledge regarding oxygen administration for high risk infant?
2- Do the nurses' have competent practice regarding oxygen administration for high risk infant?
3- What is the nurses' attitude regarding oxygen administration for high risk infant?

SUBJECT AND METHODS

The subject and methods for this study were portrayed under the four main designs as follows:

I-Technical design

II- Operational design.

III- Administrative design.

IV-Statistical design.

I- Technical design:

The technical design included research design, setting, subject and tools for data collection.

Research design:

A descriptive cross sectional study was utilized for the current study.

Research setting:

The study was conducted at NICU and PICU at Beni-Suef University Hospital, affiliated to Ministry of Higher Education. Neonatal intensive care unit was located in the fifth floor and consisted of four rooms: the first room contained 7 incubators, the second room contained 10 incubators, the third room contained 8 incubators, and the fourth room contained 5 incubators. The total number of incubators in NICU (30) incubators. Pediatric intensive care unit was located in the fourth floor and consisted of two rooms: the first room contained 10 beds, and the second room contained 3 beds used as isolation room for infectious cases. The total number of beds in PICU (13) beds. The selection of this hospital was based on several reasons: it is a big hospital that educates all levels of the medical field and provides medical services for free to all patients.

Research subject:

A purposive sample of (80) nurses working in the previously mentioned setting was included in the study, after fulfilling the following criteria:

Inclusion criteria:

- Nurses working at NICU & PICU.

- Nurses years of experience at least 6 months in NICU & PICU.

- Nurses from both sex.

- Nurses caring high risk infant undergoing oxygen therapy.

Exclusion criteria:

- Nurses not willing to participate in the study.

- Nurses not present at time of data collection.

Sample size:

The total number of nurses working at neonatal and pediatric ICU at Beni- Suef University Hospital in Beni -Suef city. In six months begins from March 2023 to begins of September 2023 was102 nurse.

N= N/{1+N(e)2} ***(Chandrasekharan et al., 2019)***.

Where n = sample size, N = population size is 102

e= 0.05

n= 102/ {1+102(0.0025)} = 80

According to the previous equation the sample size was 80 nurses.

Tools for data collection:

The data were collected by using the following tools:

Tool(I): A structured interviewing questionnaire:

It was developed by the researcher based on Mohamed (2021) and El-Garhy et al., (2020). It was written in Arabic language after reviewing the recent and related literature in the form of closed ended questions and multiple choices to collect the required data. It consisted of 2 parts:

Part (1): Characteristics of the studied nurses included questions related to age, years of experience, educational level, training courses regarding oxygen therapy, gender, work place.

Part (2): Nurses' knowledge about oxygen administration it contained 39 questions divided, as the following:

- 19 questions about nurses' knowledge regarding oxygen administration
- 12 questions about nurse's knowledge regarding role of nurses toward oxygen administration.
- 8 questions about nurse's knowledge regarding quality of nursing performance toward oxygen administration for high risk infant.

Scoring system to knowledge:

Scoring system for knowledge of the studied nurses was calculated as the following: The total numbers of questions were 39 questions, total score of 78 were given for all questions. The studied nurses' answers were compared with a model key answer, where (2) scores were given for a completely correct answer, (1) for an incompletely correct answer, and (0) for a do not know or incorrect answer.

According to the nurses' answer their total level of knowledge was categorized as the following:

- Good level of knowledge ≥ 75 %

- Average level of knowledge 60 < 75%

- Poor level of knowledge < 60%

Tool (II): observational checklist:

It was adapted from the Bowden &Greenberg (2019) and El-Garhy et al., (2020). It was modified by the researcher to assess nurses' practice regarding oxygen administration. It was included the following procedures:

- Pulse oximeter monitoring :10 items.
- Assessing respiration: 5 items.
- Oxygen administration: 33 items.
- Ventilator connection: 18 items.
- Caring infant connected to mechanical ventilator: 26 items.
- Nasal CPAP connection :11items.
- Caring infant connected with nasal CPAP :15 items.

Scoring system to practice:

Nurses' practice was classified into: (1) score was given for completely done, (0) score was given for incompletely done and not done, pulse oximeter monitoring scored 10, assessing respiration scored 5, oxygen administration scored 33, ventilator connection scored 18, caring infant connected with mechanical ventilator scored 26, nasal CPAP connection scored 11, and caring infant connected with nasal CPAP scored 15 that made a total score of 118 grades equal 100% for all checklists.

Their total level of practice was categorized as the following:

- Competent level of practice ≥75 %

- Incompetent level of practice < 75 %

Tool (III): Nurses' attitude scale toward oxygen administration:

It was adopted from ***Rensis (1932)*****.** To assess nurses' attitude toward oxygen administration in NICUs & PICUs.It was contained 14 items using three point likert scale.

Scoring system to attitude:

The nurses' response was classified into three point likert scale, agree (2), sometimes agree (1) and disagree (0). For 11 of the statements (1,2,3,4,5,6,7,8,9,13,14). Where scoring was reversed for 3 of the statements (10,11,12) as the following agree (0), sometimes agree (1) and disagree (2). Total scores were ranged as the following:

- If total score of answer was 80 % and more was positive attitude.

- Less than 80 % to 60 % was indifferent attitude.

- Less than 60 % was negative attitude.

II- Operational design:

Preparatory phase:

It included reviewing of past, current, national and international related literature and theoretical knowledge of various aspects of the study using books, articles, internet, periodicals and magazines to develop tools for data collection.

Tool Validity:

The validity of the tools was tested via three experts in pediatric

nursing specialty from Faculty of Nursing Helwan University. Necessary modifications were done according to the expert's opinions and the tool was tested for accountability and applicability. The opinion was elicited regarding the layout, format of the questions and all of their remarks were taken into consideration and the tools were regarded as a valid from the experts' point of view.

Tool reliability:

The study tools were tested for their internal consistency by calculating cronbach's alpha, which was (0.93) for the knowledge questionnaire, (0.91) for practice checklists, and (0.73) for the nurse's attitude.

Pilot study:

A pilot study was carried out on 8 nurses (10%) of the sample. It took 4 weeks from the beginning of March 2023 to the beginning of April 2023. The purpose of the pilot study was to test applicability, clarity, sequence of purpose relevance, feasibility of the study tool and questions to maintain consistency. No modifications were made so, nurses who were included in the pilot study were included in the study sample.

Field work:

The field work was carried out over six months, started from April 2023 to begins of September 2023. The research investigator was available at each study setting by rotation, two days/weekly (Monday and Wednesday), throughout the morning shift from 9 am to 2 pm and started by introducing herself to the nurses, then informing them about the aim of the study. Each nurse was individually interviewed to complete the structured questionnaire within 10–15 minutes in the conference room or nurses' room of NICUs and PICUs, while their nursing care practice was assessed using observational checklists during their actual practice. The time consumed for assessing procedures takes 10–20 minutes, according to the checklist. The infant data was collected by the research investigator from the hospital's medical records.

III- Administrative design:

An official permission was obtained from the Dean of Faculty of Nursing Beni- Suef University, directors of Beni-Suef University Hospital and the director of NICUs & PICUs to conduct this study, the permission letter included the necessary data, the purpose and nature of the study.

Ethical considerations:

An official permission to conduct the proposed study was obtained from the Scientific Research Ethics Committee Faculty of Medicine Beni-Suef University. Approval No:(FMBSUREC/12022023/Hassan). Participation in the study was voluntary and subjects were given complete full information about the study and their role before signing the informed consent and they had the right to refuse to participate. The ethical considerations included explaining the purpose and nature of the study, stating the possibility to withdraw at any time, confidentiality

of the information where it was not accessed by any other party without taking permission of the participants. Ethics, values, culture and beliefs were respected.

IV-Statistical design:

Data were coded and transferred into specially designed formats for data entry then data were analyzed and computed. The collected data was organized, categorized, tabulated in tables using numbers and organized, percentage, means, Chi-square test and standard deviation (SPSS version 20).

Statistical analysis:

Quantitative data were described using number, percentage, mean, stander deviation. Chi-square test, r test and p value were used to estimate the statistical significant differences between the study variables.

Level of significance was accepted at:

- Statistically significant difference <0.05
- No statistically significant difference > 0.05
- High statistical significant difference < 0.001

Limitation of the study:

Overload of nurses' duties in addition to their shortage which hinder the process of data collection so, some nurses were reluctant to participate in the study and they stated that they participated in many studies before that at Beni-Suef University Hospital.

RESULTS

Table (1): reveals that three quarters (75%) of the studied nurses were in the age group of 20 to less than 30 years, with a mean age of (± SD = 23.25 ± 5.4) years. Additionally, this table shows that more than half (55%) of them were female. Regarding qualification, almost two thirds (65%) of them graduated from a technical institute of nursing and the majority (82.5%) of them had one to less than five years of experience with a mean (± SD = 3.12 ± 2.1) years. Also, it was found that more than two thirds (70%) of them worked in neonatal intensive care unit (NICU) and more than half (53.8%) of them attended training courses about oxygen administration.

Figure (1): Illustrates that more than half (53.75%) of the studied nurses had a good level of total knowledge regarding oxygen administration for high risk infant. Also, more than one third (36.25%) of them had an average level of total knowledge regarding oxygen administration for high risk infant, while less than one fifth (10%) of them had a poor level of total knowledge regarding oxygen administration for high risk infant.

Figure (2): Indicates that almost two thirds (65%) of the studied nurses had a competent level of total practice regarding oxygen administration for high risk infant, while more than one third (35%) of them had an incompetent level of total practice regarding oxygen administration for high risk infant.

Figure (3): Clarifies that two thirds (66.25%) of the studied nurses had a positive attitude regarding oxygen administration for high risk infant. Also, less than one quarter (23.75%) of them had an indifferent attitude regarding oxygen administration for high risk infant, while less than one fifth (10%) of them had a negative attitude regarding oxygen administration for high risk infant.

Table (1): Percentage distribution of the studied nurses according to their characteristics (N = 80).

Nurses' characteristics	Total Number = 80 (100.0%)	
	No.	%
Age in years:		
20: <30Years	60	75.0
30: < 40	20	25.0
40 +	0	0.0
$\overline{X}$ ± SD = 23.25 ± 5.4		
Gender		
Male	36	45.0
Female	44	55.0
Qualification		
Technical institute of nursing	52	65.0
baccalaureate	28	35.0
Years of experience		
6 m: < 1 y	8	10.0
1: < 5	66	82.5
5 :< 10	6	7.5
≥ 10	0	0.0
$\overline{X}$ ± SD = 3.12 ± 2.1		
Work place		
Neonatal Intensive Care Unit (NICU).	56	70.0
Pediatric Intensive Care Unit (PICU).	24	30.0
Previous training courses		
Yes	43	53.8
No	37	46.2

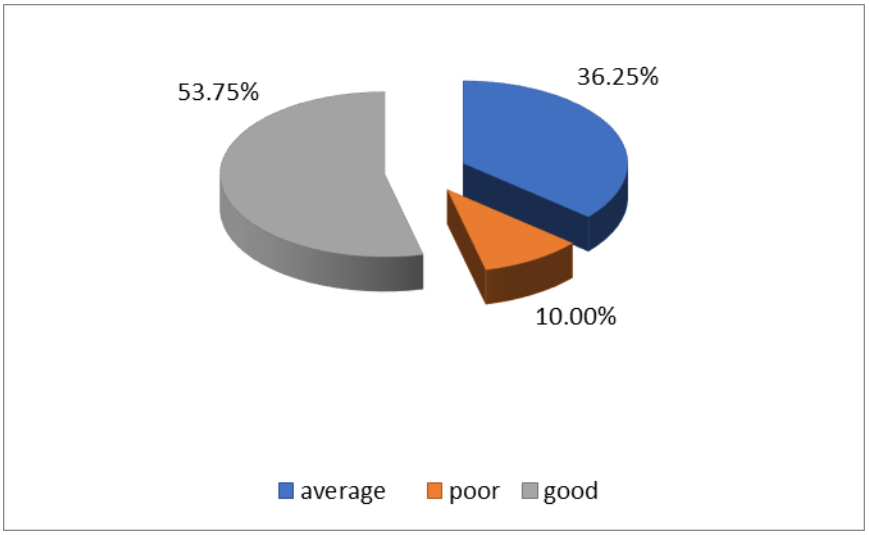

Figure (1): Percentage distribution of the studied nurse's total level of knowledge regarding oxygen administration for high risk infant(N=80).

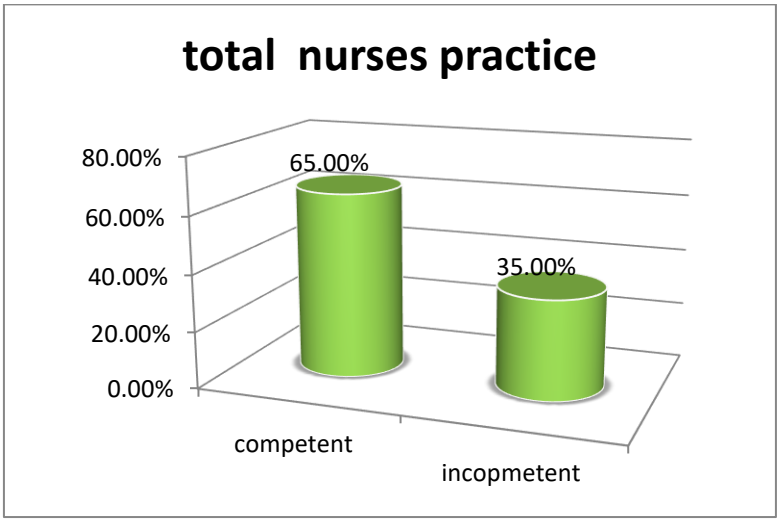

Figure (2): Percentage distribution of the studied nurse's total level of practice regarding oxygen administration for high risk infant(N=80).

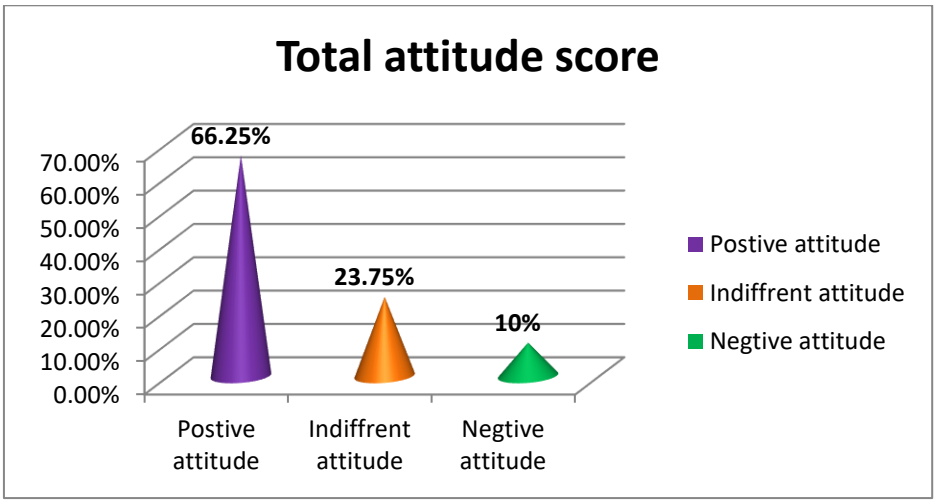

Figure (3): Percentage distribution of the studied nurse's total level of attitude regarding oxygen administration for high risk infant (N = 80).

DISCUSSION

Oxygen is the most frequently used drug in the management of sick infants. Oxygen is a drug like most drugs, has safe dose ranges, adverse physiologic effects, and toxic manifestations that are associated with higher doses and prolonged use. So, the administration of oxygen should be done with as much care and attention as any other drug. Oxygen administration is the process of increasing the concentration of oxygen in inspired air to treat hypoxia. The goal of oxygen administration is to give just enough oxygen to return the arterial oxygen saturation to the appropriate amount for the infant (Meier& Kock ,2022).

Regarding the characteristics of the studied nurses, the present study result illustrated that three quarters of the studied nurses were in the age group of 20 to less than 30 years, with a mean age of (± SD = 23.25 ± 5.4) years. This result was agreed with Diab et al., (2022) who conducted a study in Sakaka City, Egypt, which entitled "Effectiveness of standardized protocol for oxygen therapy on improving nurses' performance and patients' health outcome" and found that the majority of the studied nurses were in the age group of 20 to less than 30 years. From the researcher's point of view, this might be due to the fact that most of the studied nurses were newly graduated, and the younger age group is usually selected to work in the critical units.

Related to the gender of the studied nurses, the result of the current study revealed that more than half of the studied nurses were female. This result was matched with Mezgebe (2022) who conducted a study about "Assessment of the knowledge and practice on oxygen therapy among residents and nurses in the pediatric department, Faculty of Medicine, Hawassa University Comprehensive Specialized Hospital, Sidama Region, Ethiopia" and mentioned that three quarters of the studied nurses were female. From the researcher's point of view, this finding might be due to the fact that males have been enrolled in nursing schools since a few years ago.

Concerning qualification, the present study showed that almost two thirds of the studied nurses graduated from a technical institute of nursing. This result disagreed with Mustafa (2023) who conducted a study at the neonatal intensive care unit of Tanta University Hospital, Egypt, entitled " Effect of an educational program on nurses' knowledge and practice of oxygen therapy "and stated that nearly one-third of the studied nurses were graduated from a technical institute of nursing. From the researcher's point of view, this can be attributed to the fact that the technical institutes of nursing provide the health agencies with a larger number of graduated nurses than faculties of nursing.

Related to years of experience, the current study mentioned that the majority of the studied nurses had one to less than five years of experience, with a mean (± SD = 3.12 ± 2.1) years. This finding was in the same direction as ELgneid et al .,(2020) who conducted a study at the chest department of Mansoura University Hospital, Egypt, entitled "Effect of implementing oxygen administration guidelines on nurses performance caring for patients with chest disorders "and found that more than half of the studied nurses had one to less than five years of experience. The researcher believed that this might be due to the fact that most of the nurses working at the NICU and PICU were newly recruited.

The current study showed that more than two thirds of the studied nurses worked in neonatal intensive care unit. This result disagreed with demilew et al., (2022) who conducted a study about "Knowledge, attitude, and practice of health professionals for oxygen therapy working in South Gondar Zone Hospitals, 2021: A multicenter cross-sectional study" and reported that less than one fifth of the studied nurses worked in neonatal intensive care unit. The researcher thought this might be due to the fact that the admission flow rate in the neonatal intensive care unit is higher than that in the pediatric intensive care unit because the NICU includes 30 incubators, compared to the PICU, which includes 13 beds. The nurse-to-patient ratio is higher in the NICU than in the PICU.

As regards previous training courses, the current study revealed that more than half of the studied nurses attended training courses about oxygen administration. This result was supported with Aloushan et al., (2019) who conducted a study about "Assessment of knowledge, attitude and practice regarding oxygen therapy at emergency departments in Riyadh in 2017: A cross-sectional study" and found that the majority of the studied nurses attended training courses about oxygen administration. Conversely, this result disagreed with Adeniyi et al., (2021) who conducted a study about "Assessment of knowledge and practice of oxygen therapy among doctors and nurses: A survey from Ondo State, Southwest Nigeria" and mentioned that more than three quarters of the studied nurses did not attend training courses. From the researcher's point of view, this finding might be due to the presence of a continuing education department in the hospital and the increased motivation of nurses for training in neonatal intensive care unit and pediatric intensive care units.

According to the studied nurse’s level of total knowledge about oxygen administration for high risk infant, the findings of the current study revealed that more than half of the studied nurses had a good level of total knowledge regarding oxygen administration for high risk infant. This result was in the same line as Mezgebe (2022) who found that more than half of the studied nurses had a good

level of total knowledge about oxygen therapy.

Also, more than one third of the studied nurses had an average level of total knowledge regarding oxygen administration for high risk infant. This result was agreed with Adeniyi et al., (2021) who found that more than one third of the studied nurses had an average level of total knowledge about oxygen therapy.

In addition, less than one fifth of the studied nurses had a poor level of total knowledge regarding oxygen administration for high risk infant, this finding was in accordance with Beza et al ., (2023) who conducted a study at Tikur Anbessa Specialized Hospital and St. Paul Hospital, Millennium Medical College in Addis Ababa, Ethiopia, entitled "Assessment of pediatric residents' knowledge, attitude, and practice regarding oxygen therapy and its complications at Tikur Anbessa Specialized Hospital and St. Paul Hospital, Millennium Medical College, Ethiopia," and found that less than one fifth of the studied nurses had a poor level of total knowledge about oxygen therapy.

On the other hand, the present study was inconsistent with Katel et al., (2021) who conducted a study about "Nursing awareness of oxygen therapy among nurses at selected district hospital in Nepal" and found that near to three quarters of the studied nurses had an unsatisfactory level of total knowledge about oxygen therapy. This finding might be due to pre-employment orientation, and most nurses are interested in reading and upgrading their' knowledge regarding oxygen administration.

Regarding the studied nurse's level of total practice regarding oxygen administration for high risk infant, the findings of the current study showed that almost two thirds of the studied nurses had a competent level of total practice regarding oxygen administration for high risk infant, while more than one third of them had an incompetent level of total practice regarding oxygen administration for high risk infant. This result was similar to demilew et al., (2022) who found that almost two thirds of the studied nurses had a competent level of total practice regarding oxygen therapy, while more than one third of them had an incompetent level of total practice regarding oxygen therapy. These results might be due to the availability of procedure books for the nurses at the unit, sufficient supplies and equipment used for oxygen administration procedures, and the fact that most of the studied nurses attained training courses about oxygen administration.

Related to the studied nurse's level of total attitude regarding oxygen administration for high risk infant, the findings of the current study revealed that two thirds of the studied nurses had a positive attitude regarding oxygen administration for high risk infant, while less than one fifth of them had a negative attitude regarding oxygen administration for high risk infant. This result was in the same direction as Areej et al., (2023) who found that the majority of the studied nurses had a positive attitude regarding oxygen therapy, while less than one fifth of them had a negative attitude regarding oxygen therapy.

Also, less than one quarter of the studied nurses had an indifferent attitude regarding oxygen administration for high risk infant. This flinging was disagreed with Beza et al., (2023) who found that more than half of the studied nurses had an indifferent attitude regarding oxygen therapy. These results might be due to

nurses' beliefs that oxygen administration procedures are usually applied to infants at the unit and nurses with a good level of knowledge are more likely to have a positive attitude towards oxygen administration.

CONCLUSION

From the results of the present study, the following can be concluded:

According to the research questions, the study findings concluded that more than half of the studied nurses (53.75%) had a good level of total knowledge regarding oxygen administration for high risk infant and almost two thirds of the studied nurses (65%) had a competent level of total practice regarding oxygen administration for high risk infant, while, two thirds of the studied nurses (66.25%) had a positive attitude regarding oxygen administration for high risk infant.

RECOMMENDATIONS

From the previous findings, the following recommendation can be suggested as:

- Upgrading nurses' performance through the continuous application of an education program for nurses about oxygen administration.
- Continuous monitoring and training from a nurse supervisor on the spot are necessary to ensure quality of care delivered by nurses to high risk infant undergoing oxygen administration.
- Continuously provide procedure manual handbooks containing all necessary information (knowledge and practice) about nursing procedures related to quality of care regarding oxygen administration.
- Encourage nurses to attend national and international conferences about oxygen administration.
- Further studies should be conducted to improve nurses' knowledge, practice, and attitudes regarding oxygen administration.

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