

Assessment of Nursing Performance for Care of Neonate with Cyanotic Congenital Heart Disease

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Abstract

Aim of the study: The study aimed to assess the nurse's performance for care of neonate's with cyanotic congenital heart disease. **Research design:** Descriptive design was used. Sample: A convenient sample included all available nurses at the NICU. **Setting:** This study was conducted at neonatal intensive care unit at Maternity & Pediatric hospital affiliated to Ain Shams University Hospital and Abo EL-Rish Hospital affiliated to Cairo University Hospital. **Tool:** Three parts were used for data collection (1) predesigned questionnaire format, include the demographic characteristics of studied nurses, and studied newborn. (2) Assessment of nurse's knowledge about cyanotic congenital heart disease. (3) Attitude assessment scale. Result: shows that the mean age of studied nurses was 25.76 ± 2.80 years, and near two thirds (62.9% & 61.4%) of them were males and had bachelor's degree respectively. **Conclusion:** Nearly to two thirds of nurses had average knowledge, less than half of them had poor knowledge and more than one tenth of them had good knowledge about care of newborn with cyanotic congenital heart disease. **Recommendations:** Design training courses for nurses to improve their knowledge, practice, and attitude about cyanotic congenital heart disease.

Key words: Cyanotic congenital heart disease.

Introduction:

Congenital heart diseases (CHDs) cover a wide spectrum from small defects, which may be totally asymptomatic and compatible with a normal lifespan to more severe forms which require urgent intervention. Many defects are possible, but most defects either obstruct flow of blood in the heart or in the vessels near to it or cause blood to take an abnormal way through the heart. Knowledge about congenital heart disease, its treatment, complications, and risk factors for critical cardiac conditions may optimize treatment and reduce incidence of complications (Goda *et al.*, 2022)

The etiology of CHD is still largely unknown. Many cases of CHD are multifactorial and result from a combination of genetic predisposition and environmental risk factors. CCHD is usually isolated and sporadic, but it can also be associated with genetic syndromes. Approximately 15% to 20% of infants with CCHD are related to known chromosomal abnormalities, most of these are aneuploidies (trisomy 21, 13, and 18 and Turner syndrome). Potential environmental risk factors include maternal illnesses, including diabetes and phenylketonuria, maternal exposure to

toxins or drugs and viral infections during pregnancy (Galvis *et al.*, 2022).

Congenital heart disease (CHD) are structural abnormalities of the heart or intrathoracic great vessels occurring during fetal development. CHD is the most common type of birth defect and the leading cause of death in children with congenital malformations. CHD can be subdivided in non-cyanotic CHD and cyanotic CHD which is also called critical congenital heart disease (CCHD). CCHD can be further classified into 3 different types of lesions: right heart obstructive lesions, left heart obstructive lesions, and mixing lesions (Ossa *et al.*, 2022).

Congenital heart disease (CHD) affects 8 to 9 per 1000 live births, and approximately 25% are considered CCHD. The incidence of CHD increases to 2% to 6% for a second pregnancy after the birth of a child with CHD or if a parent is affected. Tetralogy of Fallot (TOF) is the most common CCHD (5% of all CCHD). Transposition of the great arteries (TGA) is the second most common CCHD (approximately 2% of all CCHD), and it is the most common CCHD manifesting in the first week after birth. It is estimated that 35% of infant deaths due to

congenital malformations are related to cardiovascular anomalies (*Galvis et al., 2022; Sudheer et al., 2022*).

Pediatric cardiac critical care nursing plays a central role in the care of patients with complex congenital and acquired heart disease. The role of nurses is to provide information regarding the disease, its treatment, prognosis, and complication, also adjusting the child emotional as well as physical reactions to illness and hospitalization. High quality of nursing care for children in Pediatric Intensive Care Units (PICU) demands professional nursing knowledge and practical skills, due to its specificity and complexity. Nurses must be knowledgeable about the human responses of children where many of their responses are physiological, yet there is a multitude of psychosocial, behavioral, and family responses that are also very important for the nurses to understand, diagnose and treatment (*Aydin et al., 2019*).

Significant of the study:

Neonatal period is accountable for 60% to 70% of neonatal mortality in latest period occurring largely up to the 6th daytime of life actuality the important indicator for high standers of care quality introduced to newborn. Approximately 9% of all births worldwide require special or neonatal intensive critical care, so high-risk neonates require close observation by experienced qualified nurses and physicians to improve their survival and healthy life (*Abusaad et al., 2019*).

Worldwide, the estimated prevalence of CHDs is 4 to 50 per1000 live births; approximately 8 out of every 1,000 newborns have CHDs, which can range from mild to severe. In Egypt, the incidence of congenital heart disease is ranged from 7 to 8 children/1000 lives birth (*Emteres & Sharawy, 2021*).

Pediatric cardiac critical care nursing plays a central role in the care of patients with complex congenital and acquired heart disease. The role of nurses is to provide information regarding the disease, its treatment, prognosis,

and complication, also adjusting the child emotional as well as physical reactions to illness and hospitalization (*Brown et al., 2019*). So, the current study conducted to assess the nurses' performance for care of neonates with cyanotic congenital heart disease.

Aim of the Study:

This study aims to assess the nurses' performance for care of neonates with cyanotic congenital heart disease.

Research Question:

1. What are the nurses' levels of knowledge and practices for care of neonates with cyanotic congenital heart disease?
2. Are there relations between nurses' knowledge and practice and their characteristics?
3. What is the nurses attitude regarding for care of neonates with cyanotic congenital in neonatal intensive care unit?
4. Is there a relation between total nurses' knowledge & practices and their attitude regarding for care of neonates with cyanotic congenital in neonatal intensive care unit?

Subject and Methods

Research Design:

A descriptive research design was utilized to achieve the aim of the study and answer the research questions.

Research Settings:

This study was conducted at NICU in Maternity& Pediatric Hospital affiliated to Ain Shams University Hospital and Abo El-Rish Hospitals affiliated to Cairo University Hospital.

Research Subjects:

A convenient subjects consist of all the available nurses working at the previously mentioned settings (70 nurses) regardless of their age, gender, qualification, or experience.

Tools of data collection: two tools were utilized in data collection.

A predesigned questionnaire this tool was designed by the researchers in simple Arabic language after reviewing the related literature and studies. It was written in the form of close ended questions (in the form of correct and in correct, yes or no and choose the correct answer) to suit the level of the study subjects, it consisted of the following part:

Part 1: Characteristics of studied subjects, it includes:

- Studied nurses as; age, gender, level of education and years of experience in NICU.
- Newborn infants as; gestational age, chronological age, birth weight and diagnosis.

Part 2: Assessment of nurses' knowledge about cyanotic congenital heart disease: this part was developed from (*Lee et al., 2017*) it includes definition, anatomy of the heart, types, risk factors, signs and symptoms, complications, and nursing management

Scoring system:

A scoring system was followed to assess nurses' knowledge about congenital heart disease. The right complete answer was scored as two-point, one point for incomplete answer and zero for the wrong answer. These scores were summed and converted into a percentage scores.

Total scoring was classified into 3 categories:

- **Good** knowledge if score $\geq 75\%$.
- **Average** knowledge if score from 60:75%.
- **Poor** knowledge if score $< 60\%$.

Observation Checklists:

It was designed by the researchers after reviewing the related literature based on (*Tabiee & Nakhaei, 2010*) and was used to assess nurses' practice toward caring of

newborn with CCHD, as performing the arterial blood gases, assess the lower extremity pulse, monitoring vital signs, care of neonate undergoing oxygen therapy, monitor the neonate's weight and fluid balance and pre-operative care.

❖ **Scoring system:**

A scoring system was followed to assess nurses' practice; each step was assigned a score according to sub-items. If the items evaluated as "done", it was taken one score and zero score for "not done". These scores were summed up and converted into a percentage score, Total scoring was classified into 2 categories:

- Competent practice if score $\geq 85\%$.
- Incompetent practice if score $< 85\%$.

Attitude Assessment Scale:

Modified Likert rating scale to assess the nurses' attitude regarding care of neonates with CCHD in intensive care unit (*Bertram, 2010*).

❖ **Scoring system:**

A scoring system was followed to assess nurses' attitude toward care of neonatal in the NICU. Each statement was scored by 2 for "agree", 1 for "uncertain" and zero for "disagree".

Scores of all the scale statements was summed up and total scoring was classified into 2 categories:

- Positive attitude if score $\geq 60\%$
- Negative attitude if score $< 60\%$

Operational Design:

Preparatory phase:

A review of the past and current related literature covering the various aspects of the research problem was done by using articles periodicals. Journal, textbooks to develop the tools of data collection and to be acquainted with the research problem.

Validity and reliability:

The revision of tools for clarity, relevance, comprehensive, understanding and applicability was done by panel of 3 experts in the field of neonatal pediatric medicine and pediatric nursing to assess the content validity of the tools and the necessary modification was done accordingly. As regards the reliability the test of chrmenboch was done.

Ethical Considerations:

Ethical committee approvals were obtained. Consent was obtained from each participated nurse and confidentiality of data and results was considered. Every nurse has the right to withdrawal from the study at any time and without giving any reasons.

Pilot study:

Pilot study was conducted on 7 nurses (10% of the study sample) to evaluate the clarity and applicability of tools and estimated time for filling the sheet tools. Subjects who shared in the pilot study were included in the study sample while there was no modification in the study tools.

Field work:

The actual field work was carried out from the beginning of July 2020 till the end of October 2020. The researchers were available three days

Results:

Table (1): shows that the mean age of studied nurses was 25.76 ± 2.80 years, and near two thirds (62.9% & 61.4%) of them were males and had bachelor's degree respectively. This table also show that more than half (57.1%) of nurses were single, and the mean years of experience was 7.12 ± 4.21 .

Figure (1): This figure illustrates that more than three quarters (77.1%) of nurses didn't attend any training courses in caring of newborns with cyanotic congenital heart disease.

weekly accordingly to their appointments for each setting. The researchers started introducing themselves to the nurses. A brief explanation for the aim of the study was done and the questionnaire was distributed to the participated nurses while the researchers were available for any clarifications. The time spent to fill sheet was around 15 to 20 minutes for each nurse. Every nurse was observed three times in the morning shift during the actual care for neonate undergoing CCHD .

Administrative design:

Approval was obtained through an issued letter from the Dean of Faculty of Nursing, Ain Shams University to directors of the previously mentioned settings. The researchers then met the Hospital director and explained the purpose and methods of the data collection.

Statistical design:

The collected data were coded and entered a Statistical Package for the Social Science (SPSS 25.0). Data were presented using descriptive statistics in the form of frequencies and percentages for categorical variables and means and standard deviations for continuous variables. Qualitative categorical variables were compared using Chi-square test. Pearson correlation analysis was used for assessment of the interrelation between knowledge, practice, and attitude scores. Statistically significant was considered at $P\text{-Value} < 0.05$.

Figure (2): This figure illustrates that nearly to two thirds (62.9%) of nurses had average knowledge, 24.2% of them had poor knowledge and 12.9% of them had good knowledge about care of newborn with cyanotic congenital heart disease.

Figure (3): This figure illustrates that more than three quarter (65.7%) of nurses had competent level of total practices, 34.3% of them had incompetent level of total practices.

Figure (4): This figure illustrates that the majority (84.3%) of the studied nurses had positive attitude about cyanotic congestive heart disease, while 15.7% of them had negative attitude .

Table (2): shows that there was a statistically significant positive correlations between total knowledge and practice ($r=.47$, $p=.00$).

Table (3): shows that there was a statistically significant positive correlations

between total knowledge and attitude ($r=.302$, $p=.011$).

Table (4): shows that there was a statistically significant positive correlations between total practice and attitude ($r=.263$, $p=.028$),

Table (1): Distribution of the studied nurses according to their characteristics (n=70).

Nurses' characteristics	No	%
Age/years		
20 < 25	12	17.1
25 < 30	50	71.4
30 ≤ 35	5	7.1
> 35	3	4.3
Mean ±SD 25.76±2.80		
Gender		
Male	44	62.9
Female	26	37.1
Qualification		
Diploma in Nursing	11	15.7
Health Technical Institute	16	22.9
Bachelor of Nursing	43	61.4
Social status		
Single	40	57.1
Married	23	32.9
Widow	7	10.0
Experience/years		
< 5 years	17	24.3
5 < 10 years	40	57.1
> 10 years	13	18.6
Mean ±SD 7.12± 4.21		

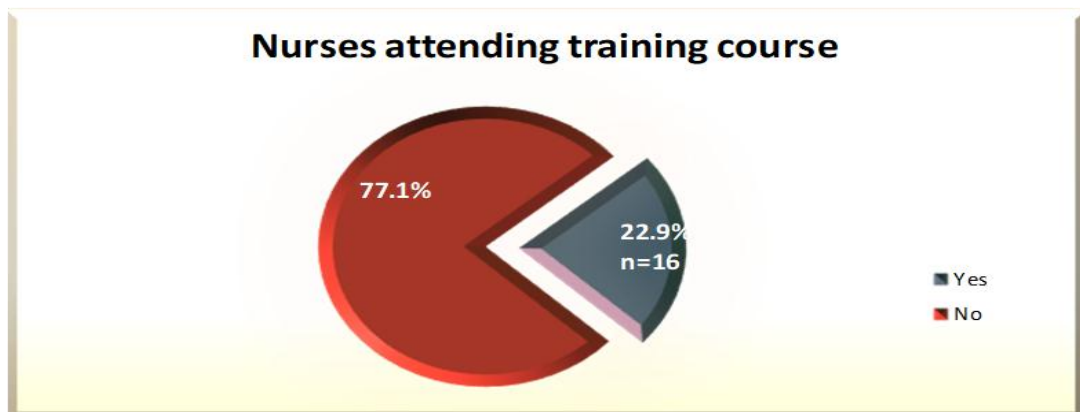


Figure (1): Distribution of the studied nurses according to their attending the training course about cyanotic congenital heart diseases (n=70).

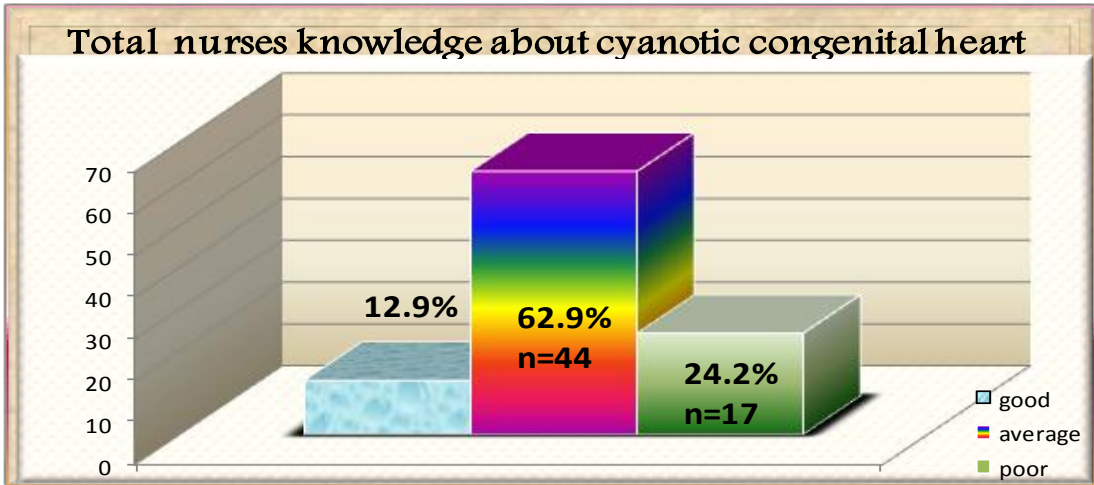


Figure (2): Distribution of the studied nurses' total practice level related to care of neonates with cyanotic heart disease (n=70).

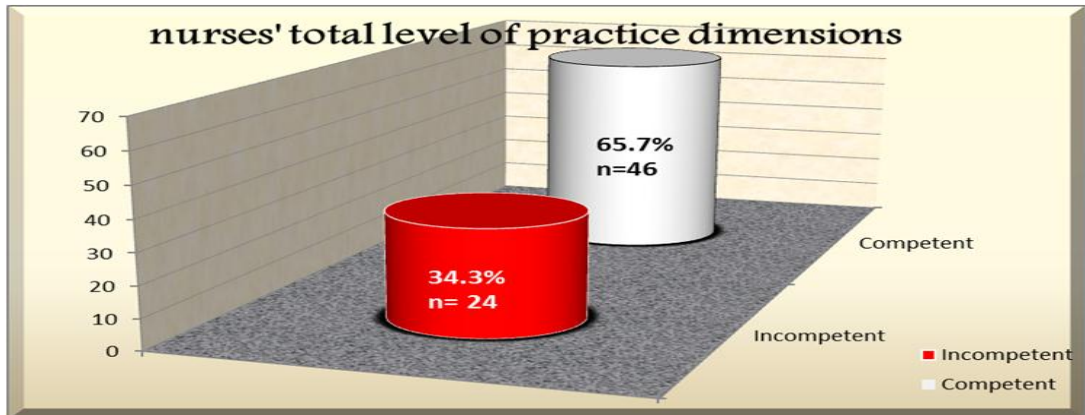


Figure (3): Distribution of the studied nurses' total practice level related to care of neonates with cyanotic congenital heart disease (n=70).

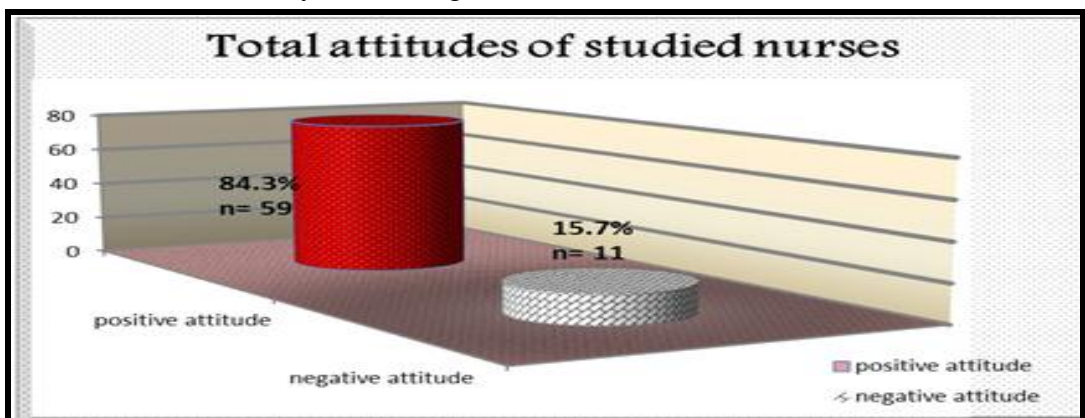


Figure (4): Distribution of the studied nurses' total attitude level related to cyanotic congestive heart disease (n=70).

Table (2): Correlation between nurses' total knowledge and total practice (n=70).

Items	Pearson correlation	Total knowledge
Total practice	r	.470**
	P	.000

Table (3): Correlation between nurses' total knowledge and total attitude (n=70).

Items	Pearson correlation	Total knowledge
Total attitude	r	.302*
	P	.011

Table (4): Correlation between nurses' total practice and total attitude (n=70).

Items	Pearson correlation	Total practice
Total attitude	r	.263*
	P	.028

Discussion :

High quality nursing care for neonate in cardiology intensive care units demands specialized nursing knowledge and practical skills, due to its complexity and specificity. Nurses must be knowledgeable about physiological, behavioral, psychosocial and responses of the family that are extremely essential to understand, diagnose and treatment of the neonate with cyanotic congenital heart disease (**Ball et al., 2018**). So, the present study conducted to assess the nurses' performance for care of neonates with cyanotic congenital heart disease.

Regarding characteristics of studied nurses, the current study result showed that, the mean age of studied nurses was 25.76 ± 2.80 years, about two thirds of them were males and had bachelor degree, more than half of them were single and the mean years of experience was 7.12 ± 4.21 . The finding of the present study disagree with **Abed Neamah, (2015)** who applied study about "Assessment of Nurses' Knowledge about a cyanotic congenital heart disease in NICU at Pediatric Hospitals in Baghdad City" and found that, less than three quarters of the studied nurses were females and less than half of them were married.

As regard to nurses who attending the training course about cyanotic congenital heart diseases, the current study result showed that more than three quarters of them didn't attend any training courses in caring of newborns with congenital heart disease. This finding was goes in the same line with **Abed Neamah, (2015)** who

found that low percentage of the studied nurses were attended one nursing session about CCHD.

Regarding total knowledge of the studied nurses about cyanotic congenital heart disease the current study result concluded that nearly to two thirds of them had average level of total knowledge about care of newborn with cyanotic congenital heart disease. This result was supported with **Abusaad et al., (2019)** who conducted study about " impact of an evidence-based educational program about pediatric open heart surgery care on both nurses and patients'outcomes" and found that, nurses' knowledge about congenital heart diseases.

The present study result disagree with **Abed Neamah (2015)** who demonstrated that, more than half of the studied nurses had accepted knowledge, more than one quarter of them had good knowledge, more than one tenth of them had poor knowledge about a cyanotic congenital heart disease.

Regarding total practice level of the studied nurses related to care of neonates with cyanotic congestive heart disease, the current study result concluded that more than two thirds of them had competent level of total practices. These results may be due to lack of continuous education. The present study results in disagreement with **Mohammed & Salih, (2020)** who applied study about "Quality of Nursing Services for Heart Problems in Pediatric Hospital Intensive Care Unit." and found that, the majority of the studied nurses had fair level of practice in total care management and only nine percentages of them had good level of practice.

As regard total attitude level of the studied nurses related to cyanotic congestive heart disease, the present study result illustrated that the majority of the studied nurses had positive attitude related to care of neonate with cyanotic heart disease. This may be due to increase the awareness of nurses about care of cyanotic heart disease due to instruction from supervisors.

As regard correlation between nurses' total knowledge and attitude the present study result concluded that there was a statistically significant positive correlations between total knowledge and attitude ($r=.302$, $p=.011$). The present study result in accordance with **Hendy et al., (2020)** who found that, there was a positive correlation between nurses' knowledge and their competency and attitude

As regard correlation between nurses' total practice and total attitude, the present study result concluded that there was a statistically significant positive correlations between total practice and attitude ($r=.263$, $p=.028$).

This result was in the same line with **Hickey et al., (2012)** who applied study about "Pediatric Cardiovascular Critical Care in the United States: Nursing and Organizational Characteristics" and stated that, there were a positive correlation between total nurses' knowledge, nurses' practice & nurses' attitude. While the current study result disagrees with **Hendy et al., (2020)** who found that, no correlation between total attitude of the studied nurses and their total practice.

Conclusion:

Nearly two thirds of nurses had average knowledge about care of newborn with cyanotic congenital heart disease. Also about two thirds of nurses had competent level of total practices, Additionally the majority of the studied nurses had positive attitude related to care of neonates with cyanotic heart disease. Moreover, there were no statistically significant differences between total nurses' knowledge and nurses' age and their social status, while there were statistically significant differences between total nurses' knowledge and their gender, years of experience and attending courses. There were

significant statistical positive correlations between total knowledge and practice, total knowledge, and attitude, and between total practice and attitude.

Recommendations:

Based on the current study finding the following recommendations were proposed:

- Training courses for nurses is important to improve their knowledge, practice, and attitude about A cyanotic congenital heart diseases
- Instruction booklets in NICU about A cyanotic congenital heart diseases to improve nurses' knowledge, practice, and attitude
- Regular and continuous educational and training programs should be applied for nurses to improve and update their knowledge, practice, and attitude about A cyanotic congenital heart diseases
- Preparing guidelines and competency checklist for the neonatal nurses who providing care for high-risk neonates
- Further researchers, about nurses' competency with increasing sample size and different settings

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