Nurses ' Knowledge and Practice regarding Central Venous Catheter Bundle Care in Neonatal Intensive Care unit

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Received: 31/08/2025

Revised:10/09/2025

Accepted: 19/09/2025

ABSTRACT

Background*:* Neonate in the Neonate Intensive Care Unit often require the use of central venous catheter for administering medications, providing nutritional and blood transfusions, and facilitating blood sampling. **Aim:** to assess nurses' Knowledge and practices regarding central venous catheter bundle care in the neonatal intensive care unit **Subjects and Method**: A descriptive design was conducted at Central Hospital of Menia-El-Qamh, Sharqia governorate. Two tools were used Tool (1) Nurses' knowledge questionnaire and Tool (2) Nurses' practice checklist about central venous catheter bundle care. **Results:** The study revealed that 87.8% of the studied nurses had an unsatisfactory level of total knowledge, and 94.0% of them had an Incompetent level of total practice about central venous catheter bundle care **Conclusion:** The study concluded that there was a statistically significant positive correlation between nurses' knowledge and practice. **Recommendations:** Recommends to implement continuous in-service training programs focusing on evidence-based CVC bundle care practices.

Keywords: Bundle Care, Central Venous Catheter, Neonate, Neonatal Intensive Care Unit Nurses' knowledge and practice.

INTRODUCTION

Neonate in the Neonatal Intensive Care Unit (NICU) often require Central Venous catheters (CVCs) to ensure effective and efficient treatment. The CVCs plays a crucial role in administering medications, delivering nutritional and blood support, and facilitating blood sampling (Foka et al., 2021). The insertion of CVCs is technically intricate procedure and may result in a variety of potential complications. These complications can occur immediately, such as bleeding, pneumothorax, or arterial puncture, or may arise later as central line-associated blood stream infection (CLABSI). This procedure should only be performed in environments that have appropriate physical conditions, equipment, monitoring, and qualified personnel (Teja et al., 2024).

Central line-associated bloodstream infection (CLABSI) are among the most common types of healthcare-associated infections (HAIs) affecting high-risk neonates in the NICU. It is characterized as a primary bloodstream infection that occurs within the first 48 hours following the insertion of a CVC and before any visible signs of neonatal infection, making it the most significant complication associated with CVC use in critical care settings (CDC, 2021) and (Sol et al., 2018).

Among the most common HAI in high-risk newborns hospitalized to NICU are CLABSI. These infections are characterized as primary bloodstream infection that develop forty-eight hours after the implantation of CVC, before the neonate exhibits clinical symptoms of illness. CLABSIs are considered the most serious complication related to the use of CVC in NICU (CDC, 2021) and (Sol et al., 2018). It is considerably decreased by applying catheter care bundle standards, with an emphasis specifically on direct instruction for nurses (Bell & O'Grady, 2018).

Care bundles are evidence-based strategies that, when integrated and regularly used, have been shown to Improving the outcome of neonate care (Kramer, Doellman, Blaser, Rosenberg & Bernatchez, 2019). The CVC bundle care includes the best CVC selection, skin antisepsis, hand hygiene, maximal barrier measures, and a daily review of line requirements with the removal of unneeded CVC. The most crucial factor in lowering the prevalence of CLABSI and enhancing the outcomes for neonate is

nursing adherence to the evidence-based practices care bundle (Payne, Hall, Prieto & Johnson, 2018).

Although **,** Device-associated infections (DAI) occurred at an incidence of 24.5% per 1,000 intensive care days in Egypt. In some poor nations, the rates for ventilator-associated pneumonia (VAP) were 15.8/1,000 days and CLABSI was 6.8/1,000 days(Hassan, El-Gilany & El-Mashad, 2019). Poor patient outcome, including higher rates of complications (such as CLABSI and occlusions), higher rates of morbidity and mortality, and longer hospital stays, are caused by inadequate nursing awareness of regular CVC administration and care (Paquet, Boucher, Valenti, & Lindsay, 2017). The CVC must be cared by nurses after the catheter is installed. The incidence of infections and other catheter-related problems is also impacted by nurses' proper care (Aydogdu & Akgun, 2020).

The study's significance

The prevalence of CLABSI varies significantly between neonatal intensive care unit (NICU). In adult ICUs, the rate ranges from 1.6 to 44.6 cases per 1,000 central line days, while in neonatal intensive care units , the rate ranges from 2.6 to 60.0 cases per 1,000 central line days. Mortality rates in neonatal ICUs can increase to 2.8% to 9.5%. One of the main reasons for hospital-acquired sepsis in specialized NICU is still CLABSI. Most effective techniques for preventing CLABSI have been care package approaches, despite the fact that several tactics have been used to reduce the prevalence of these illnesses (Al Bizri et al., 2023 & Abbady, Gaballah, Abotakia & Sherif, 2019). In Egypt, the rate of CLABSI is 14.1 per 1000 central lines per day in the PICU (Abdelmoneim et al., 2020).

AIM OF THE STUDY

To assess nurses' Knowledge and practices regarding central venous catheters bundle care in the neonatal intensive care unit.

Objectives of study:

- Assess nurses’ knowledge level regarding the central venous catheter bundle in the neonatal intensive care unit (NICU).

- Evaluate nurses' practices of nurses in implementing CVC bundle care in the NICU.

Design of research:

A descriptive design was utilized in the current study.

Setting:

This study was conducted at the Neonatal Intensive Care Unit (NICU) at one of the Ministry of Health hospitals, titled Minya El Qamh Central Hospital in Sharqia governorate, Egypt. The NICU consists of two rooms for neonates having different diagnoses; the first room contains 15 incubators and the second room contains 7 incubators.

Subjects:

All of the nurses working in the previously mentioned study setting was included during the period of data collection the convenience sample (33 nurses)(the convenience sample).

Tools of Data Collection

The data for this study were collected using two tools.

Tool (I): A structured interviewing questionnaire sheet

This tool was adapted by the researchers in Arabic, based on a comprehensive literature review from Abbady et al. (2019), APSIC (2016), and the CDC (2017). It was designed to assess nurses' knowledge about central venous catheters (CVCs) before and after the implementation of the training program. The questionnaire consists of two parts:

Part I:

(A) Personal and demographic Data of the Studied Nurses:

This section included demographic and professional information such as age, gender,

educational level, years of experience in neonatal nursing, and prior attendance of training courses related to central venous catheter bundle care.

(B) Demographic and clinical Data of the Studied Neonates: Data in this section were extracted from the neonates' medical records and included diagnosis, gender, site of CVC insertion, presence of bloodstream infection upon admission, and the number of hospitalization days.

Part II: Assessment of nurses' knowledge related to central venous catheter, Central line-associated bloodstream infection, and the neonatal central venous catheter care bundle was conducted through the following:

A. Nurses' Knowledge regarding CVCs in NICU was evaluated using seven multiple-choice questions. These items covered areas such as the definition of CVCs, their indications, types, insertion sites, possible complications, flushing procedures, and hand hygiene practices including alcohol-based hand rubs.

B. Nurses' Knowledge of Central line-associated bloodstream infection was measured with six questions focusing on its definition, clinical signs and symptoms, vein infections, associated risk factors, potential causes, and the process of obtaining cultures for infections related to central venous catheter use.

C. Nurses' Knowledge regarding CVC bundle care in neonates was assessed using 15 questions. Five of these were multiple-choice items addressing the most effective disinfectants for infection prevention, suitable disinfectants for infants under two months, the recommended interval for changing total parenteral nutrition (TPN) administration sets, dressing change frequency when transparent dressings are used, and general strategies to reduce CLABSI risk. The remaining ten were True/False questions exploring aspects such as hand hygiene, guide wire usage, bundle care practices, multi-lumen use, lumen disinfection, routine CVC removal every three days, CVC removal in the event of fever, using of personal protective equipment (PPE) during insertion, necessity of antibiotic ointment at the insertion site, and removal of CVCs inserted in emergency situations within 24 hours.

Knowledge Scoring Method

Nurses' answers were assessed using an answer key, with each correct response awarded one point and incorrect responses given zero.

The total score was calculated by summing all correct answers. This score was then converted to a percentage by dividing it by the maximum possible score and multiplying by 100. Based on the resulting percentage, knowledge levels were classified as:

- Satisfactory knowledge: ≥ 85%
- Unsatisfactory knowledge: < 85%. Abdel Salam, Y. A., Nour El Din, S., & El Masry, S. (2021) & Khalifa, M. E., Omar, T. K., El-Gendy, F. M., Ahmed, H. M., & Saad, A. A. (2022).

TOOL (2): Nurses' Practice Checklist about Central Venous Catheter Bundle Care

Nurses' practice Checklist about central venous catheter bundle care: This tool was adopted from Abbady et al (2019); CDC, (2017). It is designed in the English language. Practice checklists were used to assess nurses' practices related to central venous catheter bundle care in the neonatal intensive care unit. This checklist covers actual nurses' practices, including surgical hand hygiene (9 items), wearing protective barriers (sterile gloves and sterile gown) (25 items), the role of nurses in assisting with the insertion of CVC (38), and nurses' practices related to the components of the CLABSI care bundle (10 items).

System of scoring for nurses' practice

The scores for every nursing practice question were categorized into two categories: done one (1) or not done (0). The overall score, which varied from 0 to 82, was split into two groups based on the following:

- ✔ Competent (≥ 85 %).
- ✔ Incompetent (< 85%) Abdel Salam, Y. A., Nour El Din, S., & El Masry, S. (2021) & Khalifa, M. E., Omar, T. K., El-Gendy, F. M., Ahmed, H. M., & Saad, A. A. (2022).

II. Operational Design:

The operational design included a preparatory phase, validity, reliability, ethical consideration, pilot study, and fieldwork.

Preparatory phase:

During this phase, the researcher reviewed national and international relevant literature by using an extensive related search theoretical knowledge of various aspects of the study using recent textbooks, scientific specialized journals, articles, magazines, and internet periodicals to build up an acquaintance with the study topic and to develop the tool for data collection.

Validity

The tools of the study were ascertained for clarity, relevance, understanding, and applicability by a panel of expert jury consisting of five experts which three in pediatric nursing and two in medical-surgical nursing. Necessary modifications were made.

Reliability

The Cronbach's Alpha test was used to assess the internal consistency of the produced tools and estimate their reliability. Reliability was determined to be 0.92 for the structured questionnaire sheet used to evaluate nurses' knowledge and 0.90 for the observational checklists used to evaluate nurses' practices with regard to central venous catheter bundle care.

Ethical Considerations

Approval was obtained from the Scientific Research Ethics Committee at the Faculty of Nursing, Port Said University, ensuring that all ethical considerations were addressed throughout the study. The purpose of the study was outlined to the hospital director to secure his consent for conducting the research. Participants were provided with a concise description of the study, assuring them that their responses would remain confidential and solely utilized for research purposes. The researcher made it

clear to the participants that they had the right to withdraw from the study at any time if they chose to do so.

Pilot study

In order to evaluate the suitability, clarity, and feasibility of the study instrument, ascertain the appropriate time required to complete the questionnaire, and identify any potential difficulties during data collection, a pilot study was conducted prior to the main study with 10% of the total sample size, or three nurses. There were no major modifications made to the tools. The nurses who took part in the pilot research were consequently added to the study sample.

Field work

The present study was carried out in the Minya El Qamh Central Hospital, during the period of six months from 1st of April 2024 until the end of May 2024, during which data collection from nurses in the Neonatal Intensive Care Unit was performed.

Neonatal Intensive Care Unit (NICU) was visited for three days per week (Friday and Saturday) from the beginning of the morning shift to the night shift (6:00 am - 8:00 pm), but Monday began from the afternoon shift to the night shift (3:00 pm to 9 pm). It took approximately 35 to 40 minutes to fulfill the interview. Which the studied nurses were divided into 11 groups, each group consist of 3 nurses.

III. Administrative Design

An official letter from the Dean of the Faculty of Nursing, Port Said University was sent to the Hospital administrator and manager of the department of NICU of Minya El Qamh Central Hospital in Sharqia governorate to carry out the research. Also, permission was obtained from Minya El Qamh Central Hospital. A clear explanation was given about the nature, aims, and expected outcomes of the study then it was possible to carry out the study. Nursing participants in the study provided further written consent.

IV. Statistical Design:

Statistical analysis was carried out using SPSS.V. 26. The collected data were reviewed, coded, arranged, and displayed through tables and charts. Descriptive statistics such as frequencies, numbers, percentages, mean values, and standard deviations were applied, in addition to correlation coefficients. Quantitative data were summarized as mean ($\bar{x}$) and standard deviation (SD), while other data were expressed using frequency distribution tables, counts, and percentages. The Chi-Square test (χ^2) and correlation analysis were used to examine the relationships among study variables. Statistical significance was interpreted as follows:

- ✔ P-value < 0.05: statistically significant
- ✔ P-value < 0.001: highly significant
- ✔ Chi-Square test (χ^2)

RESULTS

Table 1 showed that all of the studied nurses were female, 60.6% of them; their age ranged between 25 and 35 years, around two-thirds of them (66.7%) had under 5 years' experience; slightly more than half of the studied nurses (57.6 %) had graduated from the Nursing Technical Institute. In relation to their marital status, more than two-thirds of them (69.7%) were married.

Table 2: Clarifies that the percentage was on these items (the optimal of disinfected solution, disinfectants are used for children under two months of age & time of dressing the Transparent) with done (15.2%, 69.7% & 30.3%), respectively.

Figure 1: Illustrates that the majority of studied nurses had an unsatisfactory level of total knowledge about CVC bundle care, while a minority of them had a satisfactory level.

Table 3: Illustrates that the percentage of the items on (performing hand hygiene, wearing PPE, using an appropriate antiseptic solution to prepare the skin before insertion & scrubbing the access port or hub with 70% alcohol for 10-15

seconds) was done (45.5% 48.5%, 48.5% & 30.3%), respectively. Nearly , all nurses (97%) reported Change any wet, dirty, or loose dressing

Figure 2: Clarified that 94 % of studied nurses had an incompetent level of total practice about CVC bundle care, while 6% of them had a competent level.

Figure (3): Revealed that one quarter (25%) of bloodstream infections were acquired from NICU and CVC, while half of bloodstream infections occurred during neonate admission.

Table 4: Revealed that there was a positive correlation between total nurses' knowledge and practice scores ($P \leq 0.05$). When the nurses' knowledge increases, they acquire more practice.

Table (1) Percentages distribution of studied nurses regarding their personal characteristics (n=33).

Personal characteristics	**No.**	**%**
Age / years		
< 25	11	33.3
25 - <35	20	60.6
35 - <45	1	3.0
≤45	1	3.0
Mean ± SD	27.9 ± 5.2	
Gender		
Female	33	100.0
Marital status		
Single	9	27.3
Married	23	69.7
Divorced	1	3.0
Education		
Nursing Technical Institute	19	57.6
Bachelor's degree in Nursing	11	33.3
Diploma	3	9.1
Experience		
< 5 years	22	66.7
5 < -10 years	8	24.2
≥ 10 years	3	9.1

Table (2) Percentages distribution of studied nurses' knowledge regarding central venous catheter bundle care (n=33).

Items	**Time**		**X2**	**p**
	No.	**%**		
1. The optimal disinfection solution				
Betadine	18	54.5	9	0.003*
Alcohol 70%	10	30.3		
Chlorhexidine	5	15.2		
2. Disinfectants are used for children under two months of age				
Betadine	23	**69.7**	**4.41**	**0.036***
Alcohol 70%	3	**9.1**		
Chlorhexidine	7	**21.2**		
3. TPN sets must be changed every				
12 hours	**26**	**78.8**	**49**	**0**
24 hours	**2**	**6.1**		
48 hours	**5**	**15.2**		
4. When using transparent gauze, it must be changed every				
24 hours	**10**	**30.3**	**7.35**	**0.007***
48 hours	**13**	**39.4**		
7 days	**30.3**	**30.3**		
5. General Principles of Bundle care				
All of the above	**33**	**100**	**0.41**	**0.522**
Total	**5**	**15.2**	**12.30**	**0.00**

*Significant at p-value ≤ 0.05

Figure (1): Total scores of nurses' knowledge regarding (C.V.C) bundle care (n=33).

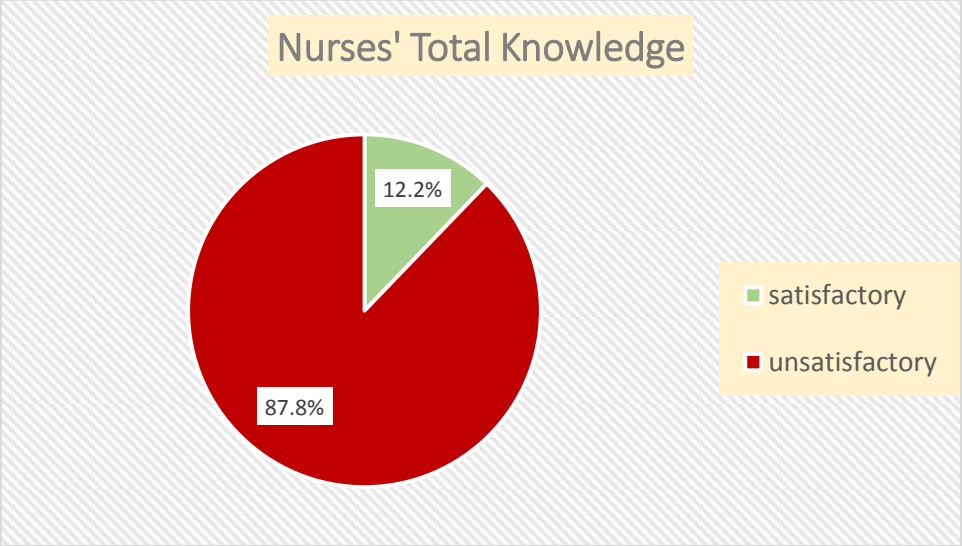

Table (3): Percentage distribution of studied nurses' total practices regarding central venous catheter bundle care, n=33.

Central venous catheter bundle care	Done		Not done		X2	P
	No.	%	No.	%		
1. Performing hand hygiene before insertion of CVC	15	45.5	18	54.5	6.75	0.008*
2. Wearing PPE before insertion of CVC.	16	48.5	17	51.5	5.90	0.009*
3. Using an appropriate antiseptic solution to prepare the skin before insertion of CVC.	16	48.5	17	51.5	5.90	0.009*
4. Waiting antiseptic to dry before puncturing the skin.	22	66.7	11	33.3	2.20	0.00*
5. Avoiding the use of the femoral vein	33	100	0	0	0.01	0.522
6. Scrub (Disinfect) the access port or hub with 70% alcohol for 10-15 seconds before each use and after.	10	30.3	23	69.7	12.30	0.011*
7. Performing a daily assessment of CVC is necessary, and documenting that in the patient record.	17	51.5	16	48.5	5.12	0.011*
8. Access catheters only with sterile devices.	16	48.5	17	51.5	5.90	0.009*
9. Change any wet, dirty, or loose dressing.	32	97	1	3	0.02	0.522
10. Wear sterile or clean gloves when changing dressings in an aseptic approach.	22	66.7	11	33.3	2.2	0.00*
Total	**16**	**48.5**	**17**	**51.5**	**4.45**	**0.006***

*Significant at p-value ≤ 0.05

Figure (2): Total scores of nurses' practices regarding (C.V.C) bundle care (n=33).

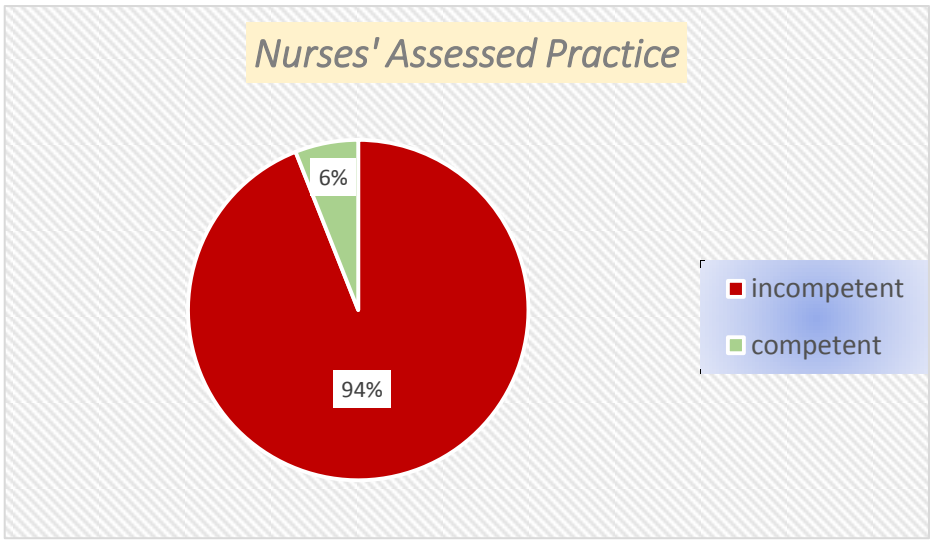

Figure (3): Distribution of studied neonate according to blood stream.

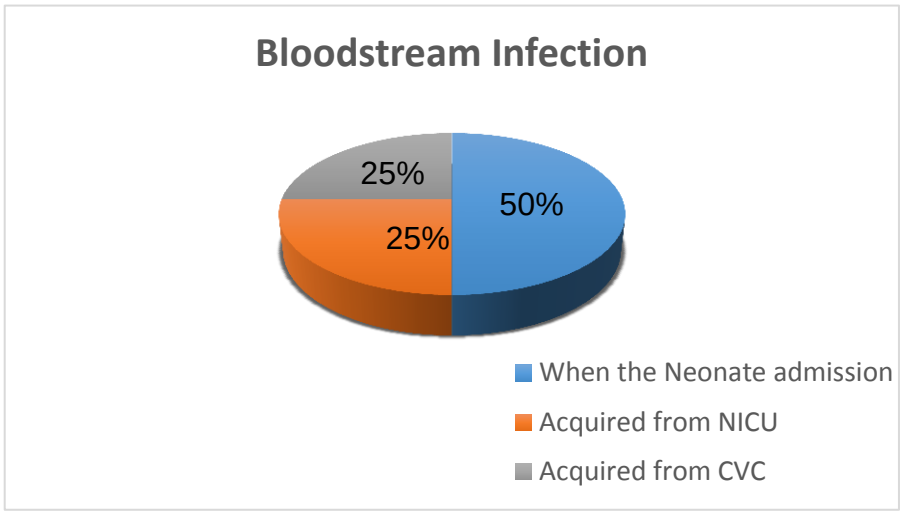

Table 4: Correlation between knowledge and practice of studied nurses regarding CVC bundle care (n=33).

Variable	**knowledge score**	
	r	P
Practice score	0.96	0.00*

DISCUSSION

In the treatment of neonate, CVC are frequently used. The use of these catheters has a higher risk of serious infectious consequences, such as CLABSI, even though they are necessary for vascular access for drugs and Total Parenteral Nutrition (TPN). The high rates of mortality and morbidity, prolonged hospital admissions, and significant healthcare costs associated with CLABSIs make them an important category of HAI. As a result, CLABSI management and prevention provide significant challenges in the medical field (Khieosanuk et al., 2022 & Hussain et al., 2021).

Central line-associated bloodstream infection CLABSI is the most prevalent healthcare-associated illness (HAI) in neonates. The majority of incidents can be avoided with proper aseptic procedures, supervision, and control (Hamza et al., 2021). Adoption of catheter care bundle practices could dramatically reduce the rate of CLABSI in neonates admitted to the NICU by focusing on direct teaching for nurses (Bell & O'Grady, 2018). Therefore, in order to lower CLRBSI and improve outcomes for pediatric patients, nurses must implement an evidence-based care package in their practices (Savage et al., 2018).

The majority of nurses in NICU had unsatisfactory knowledge regarding CVC bundle care, according to the current study. This may be because more than half of the nurses had only a nursing technical institute degree and little experience. while The most of nurses had incompetent total level of practice regarding CVC bundle care in neonates may be attributed to decline of nurses' knowledge, limited resources and training related to care of the CVC and burden of work.

A tincture of iodine, an iodophor, or 70% alcohol may be used if chlorhexidine is not appropriate. The application of maximal sterile barrier precautions has been shown to be helpful in lowering the CLABSI rates (Said, N., Yassien, S., & Ali Ameen, D., 2020) & (Yasuda et al., 2021). In the results of the current study, more than half of the participating nurses exhibited inadequate knowledge, specifically regarding the use of disinfectants for children under two months of age, with a preference for betadine. This preference may stem from its widespread use in Egyptian governmental hospitals. The study revealed that most of the nurses

suggested chlorhexidine as the optimal disinfectant solution, which may be influenced by the unavailability of chlorhexidine in the study setting, leading to a lack of familiarity with it.

Concerning nurses' knowledge of transparent dressings, it is essential to replace them every 7 days, yet less than one-third of those surveyed provided the correct information. This finding contradicts with (CDC, 2020), (Gorsk et al., 2021) & (NHMRC, 2021) that state the CVC bundle care involves ensuring the dressing remains clean, dry, intact, and is changed according to policy, specifically indicating that dressings should not be loose, soiled, or damp. The guidelines specify every 2 days, gauze dressing should be changed, while every 5 to 7 days, transparent dressing should be changed, following proper aseptic techniques with the appropriate equipment.

The low level of knowledge among the nurses surveyed could be due to insufficient opportunities to attend workshops, seminars, or access to guideline booklets about central CVC bundle care in the NICU. Furthermore, more than two-thirds of the nurses were inexperienced, having worked for less than five years.

Using the right aseptic technique during CVC procedures and washing your hands properly before inserting or maintaining a CVC will help prevent bloodstream infections (CDC, 2022). Regarding the nurses evaluated in this study, just under fifty percent demonstrated proper surgical hand washing practices. This outcome is in line with the CDC's (2020) recommendation that hands and forearms be decontaminated by performing a "surgical scrub" for two minutes with water and antibacterial soap or a hand rub containing alcohol, then letting them dry. This can indicate a failure to comprehend and use appropriate hand washing practices.

Using personal protective equipment (PPE), applying a suitable antiseptic solution to clean the skin prior to insertion, and scrubbing the access port or hub with 70% alcohol for 10-15 seconds are crucial steps to prevent infection. Based on the results of the present examination over fifty percent of the nurses observed exhibited inadequate practices regarding the use of PPE and appropriate antiseptic solutions for skin preparation before insertion. This outcome is in opposition to the findings of Lin et al. (2022), which reported that equipment setup using aseptic techniques and

maintaining aseptic conditions during the insertion and management of intravascular catheters were followed.

Regarding the nurses' practices related to catheter hubs, it was shown that more than two-thirds failed to scrub (disinfect) the access port or hub with 70% alcohol for 10-15 seconds before each use. Matlab et al., 2022 reported that, nurses who possess adequate knowledge can convert that understanding into attitudes and exhibit their knowledge through skills and practices while caring for patients with CVC, potentially decreasing the risk of central line-associated bloodstream infections CLABSI

The current findings also highlighted strong positive correlation of the nurses studied between knowledge and practice. In opinion of the researcher, this may suggest that knowledge serves as the primary guideline for anyone's attitude and practice. The findings from this study indicate that most nurses exhibited inadequate practices concerning CVC bundle care. This could be explained by the fact that over half of the nurses had certificates from the Nursing Technician Institute, as well as the lack of manuals of procedure and ongoing training programs, policies, guidelines, and protocols for CVC bundle care that should be accessible in the NICU department, in sufficient quantity and in both Arabic and English.

Bloodstream infection constitute a substantial proportion of hospital-acquired infections in (NICU), posing serious risks to neonatal health and contributing significantly to morbidity and mortality rates which occurring in up to 85% of cases; in certain units, confirmed infection rates among admitted neonates have surpassed 36% (Abdel-Hady et al., 2014; Salem et al., 2022). With respect to bloodstream infections in neonates with CVCs, it was found that a quarter (25%) of these infections were acquired through the CVC.

A strong positive correlation was found between nurses' knowledge and their practice, with those possessing satisfactory knowledge exhibiting competent performance.

CONCLUSION

The present study revealed that the majority of NICU nurses had unsatisfactory knowledge and incompetent practices regarding central venous catheter (CVC) bundle care. A statistically significant positive correlation was found between nurses' knowledge and their practices, indicating that improving knowledge is essential for enhancing practice

RECOMMENDATIONS

- Implement continuous in-service training programs focusing on evidence-based CVC bundle care practices.
- Integrate CVC bundle care content into undergraduate and postgraduate nursing curricula.

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تأثير برنامج تعليمي عن حزمة رعاية قسطرة الوريد المركزية على أداء الممرضين وعدوى مجرى الدم لحديثي الولادة

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الخلاصة

غالبًا ما يحتاج الأطفال في وحدة العناية المركزة لحديثي الولادة إلى استخدام القسطرة الوريدية المركزية لضمان رعاية فعالة وكفؤة. تلعب القسطرة الوريدية المركزية دورًا حيويًا في إعطاء الأدوية وتوفير الدعم الغذائي ودعم الدم وتسهيل أخذ عينات الدم. الهدف: تقييم معرفة وممارسة الممرضين حول رعاية حزمة القسطرة الوريدية المركزية في وحدة العناية المركزة لحديثي الولادة. أدوات جمع البيانات: تم استخدام تصميم بحث وصفي في هذه الدراسة في أحد مستشفيات وزارة الصحة (مستشفى منيا القمح المركزي) في محافظة الشرقية. تم استخدام أداتين لجمع البيانات المطلوبة تتكون من الأداة (1) استبيان معرفة الممرضات حول رعاية حزمة القسطرة الوريدية المركزية. الأداة (2) ملاحظة الممرضين لممارسة رعاية حزمة القسطرة الوريدية المركزية. النتائج: كشفت نتائج الدراسة أن 87.8٪ من الممرضين لديهم مستوى غير مرضٍ من المعرفة والمعلومات وأن 94.0٪ منهم لديهم مستوى غير كفء من الممارسة حول رعاية حزمة القسطرة الوريدية المركزية. الاستنتاج: خلصت الدراسة إلى وجود علاقة ذات دلالة إحصائية بين معارف وممارسة الممرضين تجاه رعاية حزمة القسطرة الوريدية المركزية. التوصيات: يُوصى بتقييم أثر برنامج تدريبي للممرضين الرعاية المركزة لحديثي الولادة عن رعاية حزمة القسطرة الوريدية المركزية على معارفهم ومعلوماتهم وممارساتهم.

الكلمات المرشدة: رعاية الحزمة الوقائية ، القسطرة الوريدية المركزية، حديثي الولادة، معرفة وممارسة الممرضين