Analysis of the Literacy in Central Venous Catheter Care Among Intensive Care Unit Nurses in a Teaching Hospital in Taiwan

Szu-Yi Wang[1], Mei-Hsiang Lin[2], Chien-Mei Sung[3], I-Hsien Lee[4]

[1]PhD student, School of Nursing, National Taipei University of Nursing and Health Sciences. RN, Nursing department, Fu Jen Catholic University Hospital, Fu Jen Catholic University, New Taipei City. Taiwan.
[2]EdD, RN. professor, School of Nursing, National Taipei University of Nursing and Health Sciences. mhlin5452@gmail.com
[3]PhD, RN, Nursing department, Fu Jen Catholic University Hospital, Fu Jen Catholic University, New Taipei City. Taiwan.
[4]MD, Department of Critical Care Medicine, Fu Jen Catholic University Hospital, Fu Jen Catholic University, New Taipei City. Taiwan.

Background and objective:

Central venous catheters (CVCs) play a crucial role in the management of patients in the intensive care unit (ICU) of a teaching hospital in Taiwan. While these devices offer healthcare providers convenience in medical interventions, they also pose risks such as catheter-related bloodstream infections (CRBSIs), which can lead to prolonged hospital stays and adverse patient outcomes. Therefore, assessing the literacy of ICU nurses in venous catheter care is essential for optimizing patient safety and outcomes.

Methods/intervention:

A cross-sectional study was conducted to assess the current competency of the medical intensive care unit(MICU) nurses in venous catheter care at a teaching hospital. A self-designed questionnaire was used to collect data from nursing staff members working in the MICU. The MICU healthcare team consisted of one hand nurse, 58 registered nurses, 16 nurse practitioners , and three MICU attending physicians, including 9 males and 69 females. The top three diseases treated in the MICU were pneumonia with respiratory failure, acute myocardial infarction, and acute stroke. Demographic details are provided in Table 1. Data collection and analysis were conducted between August 1, 2022, and January 31, 2023.

Table1. Basic demographic characteristics of MICU staff and characteristics of MICU ward diseases

	N = 78
Gender	
man	9 11.54%
female	69 88.46%
Nursing manpower establishment	
HN (n/%)	1 1.28%
Nurse (n/%)	58 74.35%
NP (n/%)	16 20.51%
Dr (n/%)	3 3.85%
Nursing experience	
<1 year (n/%)	11 19.00%
1-2 years (n/%)	25 43.10%
2-3 years (n/%)	6 10.30%
3-4years (n/%)	6 10.30%
>4 years (n/%)	10 17.30%
Bed occupancy rate	72.30%
Major disease	
Pneumonia with acute respiratory failure	27.10%
AMI	9.10%
Acute stroke	7.50%
APCHE II score	19.76

Note: HN= Head nurse, NP= Nurse Practitioner, Dr= Doctor

Results:

Using a self-designed questionnaire, a total of 43 MICU nurses were assessed and analyzed for their competency in caring for catheter-related bloodstream infections. The questionnaire analysis results are presented in Table 2. The analysis revealed the following findings: 1.Correctness of catheter site care: catheter replacement timing: 7%, dressing change timing: 32.6%, dressing selection: 32.6%. 2.Correctness of infusion line replacement timing: General infusion lines: 67.4% and Blood products or lipid emulsions: 90.7%.(Table 2.)

Table 2.Correct understanding of care for bloodstream infections N = 43

	n	%
1.Correctness of catheter site care:		
Do central venous catheters (CVCs) need to be regularly replaced?	3	7%
How often is it recommended to change the dressing at the catheter insertion site?	14	32.6%
What is recommended to cover the catheter insertion site?	14	32.6%
2.Correctness of infusion line replacement timing:		
When using continuous infusion or administration via venous access (excluding blood, blood products, or lipid fluids), how often should the administration tubing be changed?	29	67.4%
When administering blood, blood products, or lipid emulsions through a CVC, how often is it recommended to replace the administration tubing?	39	90.7%

Conclusions/lessons learned:

Based on the analysis of questionnaire results, there is a need to enhance the understanding and implementation of catheter site care timing and dressing selection among MICU nursing staff. Therefore, in addition to establishing standardized procedures for infusion line care, further measures such as relevant training courses should be implemented to improve the competency of nursing staff in venous catheter care in a teaching hospital ICU in Taiwan.

Key words:

Central venous catheter, intensive care unit, catheter-related bloodstream infections, ICU nurses, literacy of venous catheter care

Corresponding Author : Szu-Yi Wang, jachiex@gmail.com