

Research Article

AN IMPACT OF NURSING CARE OF THE PATIENT WITH CENTRAL VENOUS CATHETER IN DIFFERENT ICU'S AT SELECTED HOSPITAL, TUMKUR

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ABSTRACT

INTRODUCTION: Central venous catheters are now commonly used in critical care units as most of these patients need a very long access. These catheters has got multiple functions like monitoring pressure of the right side of the heart ,administration of intra venous fluid ,medications and nutrients .Improper management of patients with central venous catheter can give rise to various life threatening complications. **OBJECTIVES:** To assess the knowledge and practice regarding care of patients with central venous catheter .To find out the correlation between knowledge and practice scores of nurses regarding care of patients with central venous catheter. Method: A Non –Experimental descriptive Research design was selected for the study and non-probability convenient sampling technique was used to select 30 Nurses working in critical care units of selected hospital in Bangalore. Data was collected by using structured knowledge questionnaire and Observational check list. Content validity and reliability was established by using Karl Pearson's coefficient Correlation (r) formula. **RESULT:** Present study results revealed that the nurses knowledge regarding care of CVC was moderately adequate and their practice was inadequate and there was a moderate correlation between knowledge and practice scores of Nurses .The study also revealed that there is no association between the knowledge and practice of Nurses with their selected socio demographic variables .A self-Instructional module was given to the nurses to improve their knowledge and practice regarding care of patients with CVC. **CONCLUSION:** This Study concluded that there is no adequate knowledge and practice s among nurses working in critical care units regarding care of patients with central venous catheter.

Keywords: Knowledge, Practice, Central venous Catheter, Nurses working in critical care units, Critical ill patients.

INTRODUCTION

The critical care unit is a hospital facility for provision of intensive nursing and medical care for critically ill patients and that needs use of sophisticated monitoring and resuscitative equipment's. The Nurses working in critical care units should be skilled in handling equipment's such as hemodynamic and cardiac monitoring system, Mechanical ventilator therapy ,Central venous catheter care and many other advanced life support devices .Critically ill patients require continuous assessment of their vital signs including cardio vascular system to diagnose and manage their complex medical condition and that can be achieved by means of direct pressure monitoring systems such as central venous catheters, Pulmonary artery catheters ,Intra Arterial Blood pressure Monitoring .Central Venous catheters are commonly used for critically ill patients because most of them need a long term access. These Catheters has got Multiple functions like monitoring pressure of the right side of the heart, administration of Intra venous fluid, Medications and nutrients .As technology is advancing at a rapid speed, nurses involved in patient care should up-to-date their knowledge. Having knowledge only is not adequate, they should apply these knowledge while providing care to patients to improve the health of patients and to prevent further development of complications. This will leads to development of nursing profession.

NEED FO RTHE STUDY

The Central I Venous Catheters are now common among critically ill

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patients. More than five million central lines are inserted each year in the United States alone. Health Care Associated Infections (HAIs), previously known as nosocomial infections, are the fourth leading cause of death among hospitalized patients. Data from the Centers for Disease Control and Prevention (CDC, 2004) reports a nosocomial infection rate of 5%, of which 10% are blood stream infections (BSIs), and an attributable mortality rate of 15%.

Four categories of infections are common in intensive care units: Blood stream infections (BSIs), urinary tract infections, lower respiratory tract infections, and pneumonia. Intra vascular devices are the common cause of blood stream infections. Approximately 80,000 catheter related blood stream infections occur in ICUs each year in United States. Central venous catheterization can be lifesaving but is associated with complication rates of approximately 15%. A study conducted on major complications of central venous catheters found out that infection, accidental puncture of lungs (1 in 200 patients), displacement of catheter tip (very rarely) and accidental puncture of the artery which may cause bleeding (1 in 100 patients) are the commonest complications of central venous catheters.

A study done at Rajiv Gandhi Cancer Institute New Delhi proved that major complications of central venous catheters are infection (1.27%), breakage/leakage (0.5%), dislodgement (0.31%) and occlusion (0.06%).

Objectives

1. To assess the level of knowledge of nurses regarding care of patients with central venous catheter.

2. To assess the level of practice of nurses regarding care of patients with central venous catheter.
3. To find the correlation between the knowledge and practice scores of nurses regarding care of patients with central venous catheter.

Hypotheses

H1: There is a significant correlation between the knowledge and practice of nurses regarding care of patients with central venous catheter.

REVIEW OF LITERATURE

A study was conducted to find out the advantages of central venous catheters in malignant patients requiring long term venous access among 110 patients at All India Institute of Medical Sciences, New Delhi, India. The mean catheter life was 120 days and total catheter related complications were observed in 37 (34.54%) patients. The study concluded that long term venous access using central venous catheters is the safe and reliable method for administration of chemotherapeutic agents, antibiotics and blood products.

A study to determine the incidence of central line-associated bloodstream infection in the medical ICU of a tertiary care hospital. During the study period, a total of 186 patients fulfilled the inclusion criteria and were enrolled in the study. Out of these 37 patients developed central line-associated bloodstream infection, accounting for 3994 catheter days and 5389 inpatient days. Thus, the incidence of CLABSI was 9.3 per 1000 central line days and 6.7 per 1000 inpatient days with a 0.7 device utilization ratio. The study concludes that the incidence of CLABSI was higher in developed nations and the pathogens associated with CLABSI were multi drug resistant. Due to rising antimicrobial resistance, surveillance programs are crucial in establishing the species distribution and resistance patterns of bacteria causing BSIs and thus provide the basis for appropriate empirical therapy. Study concluded that surveillance programmes should be encouraged which will help in reducing these nosocomial infections and thus ultimately help in better outcomes for patients.

A randomized trial conducted on central venous access sites to prevent venous blood clots, blood vessel narrowing and infections in patients requiring long-term intravenous therapy at School of Health and Social Care, Oxford Brookes University revealed that the upper chest area was better than the femoral area for central venous catheter insertion because of a lower risk of infection and blood clots forming in catheters.

An observational study was conducted to assess nurses practice of central venous catheter care at University of California. The areas assessed were administration of medications and fluids, CVP monitoring and site care. The study revealed that 64% of nurses were having inadequate practice and 36% had moderately adequate practice. None of the nurses were found to have adequate practice.

A descriptive research study was conducted in Bengaluru Karnataka to assess the knowledge regarding management of patient with central venous access devices among Intensive care unit (ICU) nurses. By using non-probability convenient sampling techniques 60 nurses were selected for the study. Data was collected using structured knowledge questionnaire. The result of the study revealed that majority 25 (41.67%) of the ICU nurses had inadequate knowledge, 34 (56.67%) had moderately adequate knowledge, and only 1 (1.67%) nurses had adequate knowledge regarding management of patient with central venous access devices. The

study findings showed that there is no significant relationship between knowledge regarding CVAD management and the selected socio-demographic variables. The study concluded that the majority of the nurses working in Intensive care units had inadequate knowledge regarding management of patient with central venous access device and the nurses should be periodically evaluated to assess their knowledge and practice and organise In-service education according to the needs of the nurses.

A quantitative descriptive survey research to assess the knowledge and practice of staff nurses regarding care of CVL. 33 staff nurses working in Aldamam hospital were selected for the study. The findings of the study concluded that there was a significant statistical difference in nurses' knowledge and years of experience, and no significant statistical differences in nurse's practices before, during, after, and removal of central venous line in relation to years of experience.

METHODOLOGY

A Non-Experimental descriptive Research design was selected for the study and non-probability convenient sampling technique was used to select 30 Nurses working in critical care units of selected hospital in Tumkur. Data was collected by using structured knowledge questionnaire and Observational check list. Content validity and reliability was established by using Karl Pearson's coefficient Correlation (r) formula. Study variables: Knowledge and practice of nurses regarding care of patients with central venous catheter and Attribute variables such as Personal and professional characteristics of nurses which include age, gender, professional qualification, professional experience, experience in present area and previous training programmes on care of patients with CVC.

RESULTS

Table - 1 Frequency and Percentage Distribution of Socio-Demographic Variables.

Sl No	Socio-demographic variables	Frequency (f)	Percentage (%)
1	Age in years.		
	21 – 25	19	63.33
	26 – 30	9	30
	31 – 35	2	6.67
	36 and above	0	0
2	Gender		
	Male Female	5 25	16.67 83.33
3	Professional qualification		
	GNM	23	76.67
	B.Sc Nursing PC. BSc Nursing	7 0	23.33 0
4	Professional experience		
	<1year	2	6.67
	1-5years	21	70
	6– 10years	7	23.33
	>10years	0	0
5	Experience in present clinical area		
	<1year	8	26.67
	1– 3years	13	43.33
	4– 6years	6	20
	>6years	3	10

6	Have you undergone any training programmes on care of CVC?		
	Yes	0	0
	No	30	100

Table 2: Mean & SD of Nursing Care Knowledge

Sl No	Aspects of knowledge	Maximum score	Mean	Mean percentage	Standard deviation
1	General information on CVC	4	2.3	57.5	0.69
2	Insertion of CVC	11	4.7	42.73	1.18
3	Care of CVC	9	4.83	53.67	1
4	Central venous pressure Monitoring	8	5.17	64.62	1.24
5	Complications of CVC	5	2.67	53.4	1.4
6	Removal of CVC	3	1.2	40	0.6
	Overall knowledge	40	20.9	52.25	3.18

Table 3: Aspect Wise Level of Knowledge on CVC

Sl No	Aspects of Knowledge	Inadequate knowledge ≤ 50%		Moderately adequate knowledge 51-75%		Adequate knowledge >75%	
		f	%	f	%	f	%
1	General information On CVC	19	63.33	10	33.34	1	3.33
2	Insertion of CVC	24	80	6	20	0	0
3	Care of CVC	11	36.67	19	63.33	0	0
4	Central venous pressure monitoring	8	26.67	19	63.33	3	10
5	Complications of CVC	16	53.33	11	36.67	3	10
6	Removal of CVC	23	76.67	6	20	1	3.33
	Overall knowledge	13	43.33	17	56.67	0	0

Table 4: Mean & SD Nursing Care Skill Practice

Sl No	Aspects of practice	Maximum score	Mean	Mean percentage	Standard deviation
1	Care of central venous catheter site.	24	9.47	39.46	1.38
2	Central venous pressure monitoring.	14	9.13	65.21	0.5
	Overall practice	38	18.6	48.95	1.47

Fig – 1 Mean & SD Nursing Care Skill Practice

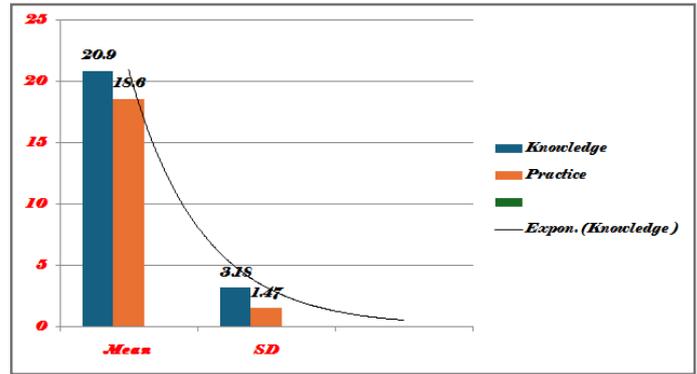
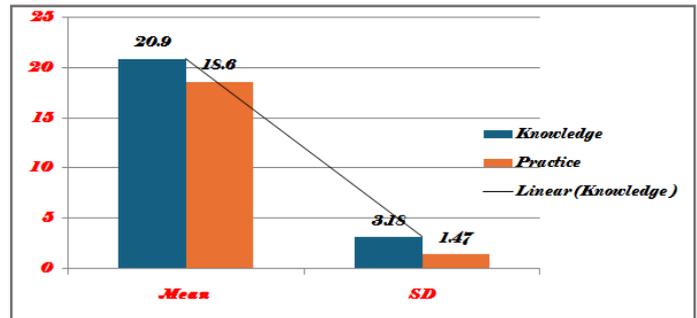


Table - 5: Correlation of knowledge and practice on cvc

Sl No	Variables	Mean	Standard deviation	r - value
1	Knowledge	20.9	3.18	r=0.6
2	Practice	18.6	1.47	t'=3.85
				df=28

r=+1 to -1, Level of significance = 0.05

Fig - 2 Correlation of Knowledge and Practice on cvc



DISCUSSION

The Study was on Impact of Nursing Care on CVC at different ICUs with the total sample size was 30. The results shows that Nurses working in ICUs had Moderate Knowledge on CVC Care with 57% and Mean 20.9 and SD -3.18 where as the skill proficiency of Nurses was with mean 18.6 and SD 1.47. The Correlation found between knowledge and practice is r-0.6 ,t-3.85 and df-28.Thus the study shows as the knowledge on CVC care proceeded the nurses clinical competency significantly improved.

However Nurses needs continuous and ongoing training program on CVC care and clinical practice particularly Nurses working in different ICUs at various Hospitals. The research hypothesis H₁, there is a significant correlation between knowledge and practice of nurses regarding care of patients with central venous catheter was accepted. The study has impact the areas such as Nursing Education, Nursing Practice, Nursing Administration and Nursing Research.

RECOMMENDATIONS

The study should be replicated with large sample size and ICU Nurses are required continuous clinical competency skills in care of CVC line and its implementation for effective care of the ICU patients. As study reveals that most of the ICU nurses did not undergone any training on care of CVC line. Therefore, study recommended

that nurses should provided clinical competencies skills in all specialty areas soon after the competition of Nursing Degree.

CONCLUSION

the study has concluded that there is no adequate knowledge those who are newly appointed nurses in the hospital. However, 1 – 5 years of experienced nurses had better clinical knowledge and competency skills compare to less than 1 year of experience nurses in the hospital. Also nurses do not adequate knowledge on complications of CVC management.

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REFERENCES

1. UrdenDLinda, JosephKDavis, ThelenALynne. Essentials of Critical Care Nursing. Sydney: Mos by year Book; 1992;3-4.
2. Phipps Wilma J, Barbara C Long, Nancy Fugate Woods. Shafer's Medical Surgical Nursing. New Delhi: B.T. Publication; 1995; 404 - 405.
3. BorniePStewart,RhondaMStrawn.Readyreferenceforcriticalcar e.Sudbury:Jones and Barlet Publishers; 2004; 280-286.
4. SmelterCSuzanne, BareGBrenda. Brunner and Siddhartha Medical Surgical Nursing. Philadelphia: Lippincot publishers; 2004; 677-697.
5. Latha U, Kusum Gurung. Knowledge Regarding Management of Patients with Central Venous Access Devices among ICU Nurses. International Journal of Health Sciences and Research Vol.12; Issue: 2; February 2022.
6. Safia Maqbool, Rajani sharma. Incidence of Central Line-Associated Bloodstream Infection in a Tertiary Care Hospital in Northern India: A Prospective Study. PMID: MC10544503 PMID: 37791205 – Aug -2023 .31;15
7. Shadia Mohamed Elsadeq Khadrawi .Assessment of nurses' Knowledge and Practice related to Caring of Central Venous Line at Aldamam hospital. Journal of Nursing and Health Science (IOSR-JNHS) 2320–1959.p Volume 8, Issue 1 Ver. III. (Jan. - Feb .2019), PP 52-57 .
