Knowledge of Central Venous Pressure Line (CVP) among Nursing Personnel working at Critical Care areas of a Tertiary Health Care Centre in Eastern Nepal

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Abstract

Monitoring of the Central Venous Pressure (CVP) is a simple, relatively inexpensive method of assessing a patient's cardiac status, circulating blood volume, and vasomotor tone. It is a measure of considerable value in patients with cardiac, vascular pulmonary, renal, or other acute problems, for regulation of fluid or blood administration and it is essential that all physicians and nurses working in critical care setting be fully aware about it **(Thomas, 1972)**. **Objective:** To assess the knowledge of CVP line among nursing personnel working in critical care areas (i.e. Intensive Care Unit /Coronary Care Unit and Dialysis Unit) of Tertiary Health Care Center. For this study a descriptive research design and enumerative sampling technique was used. Semi structured tool was developed for data collection. The critical care areas (i.e. ICCU/CCU and Dialysis Unit) were chosen for study. The findings revealed that majority (96%) of respondents had knowledge of CVP line, 60% had knowledge about main insertion site of Central Venous Catheter, 98% had knowledge about the anatomy and physiology of heart for Central Venous Catheter, and 94% had the knowledge about the purpose of CVP catheterization. Based on the findings it is concluded that nursing personnel in general have knowledge regarding CVP Line.

Key Words

Knowledge, CVP Line, Nursing Personnel, critical care areas.

Introduction

Central Venous Pressure is one of the important monitoring tools for all critically ill patients. It is a safe and efficient method of assessing hemodynamic status. Proper knowledge about its indications techniques and complications among members of critical care team is essential for obtaining favorable outcome. Valuable information can be achieved by assessing the practical knowledge of the caregivers regarding handling of CVP for providing feedback, improving the quality of care as well as formulating policies. Our hospital has relatively higher nursing staff turnover rate. Moreover the employed nurses are of different level of schooling and background making the nursing work force (including working in the critical care areas) relatively heterogeneous in competency.

Therefore, the present study attempted to assess the knowledge of CVP amongst nurses working in critical care setting of a tertiary care hospital of eastern Nepal.

Materials and Methods

A descriptive research design was used. Non probability, purposive and enumerative sampling technique was adopted. Total population was fifty nurses, among them 35 staff nurses were from Intensive Care Unit and Coronary Care Unit and 15 from Dialysis Unit. Before proceeding for data collection, written permission was taken from the institutional authority and verbal informed consent was obtained from all subjects. Self administered

semi-structured questionnaire was developed and distributed to each respondent for data collection. Data were analyzed using descriptive and inferential statistics.

Results

Majority (52%) of the subjects belonged to age group 21-23 years. Training wise most (54%) of the subjects were trained from government Institution and 92% had Diploma of Nursing degree. Only 8.0% of respondents had training on CVP catheterization. Experience wise, majority (78%) of the subjects had 1-2 years of experience. Seventy percent of the subjects were working in ICCU/CCU while the rest in the Dialysis Unit (refer to table – 1**).**

Table no – 1
Percentage distribution of Sample Characteristics

n =50

Characteristics	Dialysis		ICCU/CCU		Overall	
	n	%Score	n	%Score	n	%Score
Age (in years)						
18 - 20	3	6	4	8	7	14
21 - 23	8	16	18	36	16	52
24 - 26	3	6	8	16	11	22
> 27	1	2	5	10	6	12
Total	**15**	**30**	**35**	**70**	**50**	**100.0**
Training Institute						
Private	8	16	15	30	23	46
Government	7	14	20	40	27	54
Total	**15**	**30**	**35**	**70**	**50**	**100.0**
Professional Qualification						
BN	0	0	4	8	4	8
PCL	15	30	31	62	46	92
Total	**15**	**30**	**35**	**70**	**50**	**100.0**
Training on CVC						
Yes	2	4	8	16	10	20
No	13	26	27	54	40	80
Total	**15**	**30**	**35**	**70**	**50**	**100.0**
Professional Experience (yrs)						
1 - 2	10	20	29	58	39	78
3 - 4	3	6	3	6	6	12
5 - 6	1	2	0	0	1	2
> 6	1	2	3	6	4	8
Total	**15**	**30**	**35**	**70**	**50**	**100.0**

Out of 50 respondents, 46% expressed of being nervous, 6% of being confident, 18% of being hesitant and 30% of being scared on caring the patient with CVP line for the first time. The majority (96%) knew that the CVP is the pressure within the right atrium and in the great veins within the thorax (refer to table -2).

Table no - 2
Respondents Knowledge about the Main Site for CVC

n = 50

Variables:-	Sites of insertion		Total	P- value
	Incorrect	Correct		
Dialysis n (frequency)	0	15	15	
%within clinical areas	0%	100.0%	100.0%	
ICCU/CCU n (frequency)	20	15	35	**<0.001**
%within clinical areas	57.1%	42.9%	100.0%	
Total n (frequency)	**20**	**30**	**50**	
%within clinical areas	**40.0%**	**60.0%**	**100%**	

Majority (60%) of respondents know about the proper CVP inserting site. Only 42% of respondents had correct knowledge of the normal value of CVP, 60% of the respondents had knowledge of the clinical indications of Central Venous Catheter. All of them agreed that knowledge of anatomy and physiology of heart is important. Regarding the knowledge about equipments and accessories needed for CVP catheterization, 24 % of respondents indicated that CVP catheter as the main equipment whereas 21% mentioned of CVP set, 14 % of heparin flush, 11% of suture 8% of guide wire, 5% of syringe, 3% of local anesthesia,3% of surgical blade, 2% of CVP scale and 16 G cannula and only 1% of consent, 3–way cannula and gloves, only 0.57% felt that Mackintosh. Majority (32.88%) of respondents had the knowledge of common routes for inserting CVP. Majority (94%) knew about the position (trendelenburg position) required for the placement of CVC in neck vein. All (100%)of the respondents had knowledge about the importance of hand washing before and after handling CVC while 94% knew about assessing correct position of CVC through x-ray as well as about the precautions to be taken before CVP measurement. Only 22% of the respondents had adequate knowledge about signs and symptoms of air embolism, 94% of respondents knew about the mechanism of air embolism. Only 34% of the respondents knew about flushing CVP the catheter with heparin if found blocked, 21% mentioned pneumothorax as the main complication after CVP catheterization, Only 6% of the respondents knew about proper interval of measuring CVP. None of the respondents knew about frequency of dressing change required at CVC site, 96% of the respondents felt that high CVP reading indicates hypervolemia. Majority (98%) of the respondents knew correct position required for measuring CVP and 40 % of respondents knew about the correct position required for removing the CVC. Excellent level of knowledge regarding CVP was present only in 3 subjects while very good and good level were present in 35 and 12 subjects respectively among nursing personnel working at Dialysis and ICCU/CCU at BPKIHS (refer to table -3).

Table no 3
Distribution of Staff Nurses' Score of knowledge regarding CVP Line according to different level. n = 50

Variables:		Knowledge Score of Staff Nurses' according to areas of work						
		ICCU/CCU		Dialysis Units				
Level of knowledge	Criterion Measures	n	%Score	n	% Score	Overall % Score	p-value	Df
Excellent	(80 % & above)	3	6%	0	0%	6%		
Very Good	(79 - 65%)	20	40%	15	30%	70%	<0.001	2
Good	(64 - 50%)	12	24%	0	0%	24%		
Total		35		15		100%		

Discussion

The present study found that more than three fourth of the nurses working in the critical care area (ICCU/CCU and Dialysis Unit) have atleast very good level of knowledge about CVP catheter and its handling in critical care setting. This study aimed at identifying the knowledge of nurses on CVP line. Majority (92%) of nurses had the PCL qualification, result obtained may be attributed to the fact that the staff nurses working in BPKIHS are predominantly registered nurses passed out PCL qualification and provide bed side nursing care. This was accordance with (Manandhar S., 2003), she had conducted similar type of research in BPKMCH, Chitwan, Nepal and her finding showed that maximum(78%) had the qualification of PCL Nursing (Desousa K.A, 1997). Respondents' knowledge about the main site as well as normal value of CVP was statistically highly significant among the nurses working in Dialysis and ICCU/CCU(John, 1998) Another study done and stated that one risk factor that nurses may influence significantly is the manner in which CVP catheter care is rented. Policy and procedures should reflect the need for validation education relating to CVP catheter care (David, 2003). It was found that majority (94%) of respondents know the purpose of CVP catheterization i.e. to determine blood volume, to provide TPN for long term, to obtain central venous blood sample. This study correspondence with the study (P., 2008 and Justin B, 2003) carried out in Baltimore, which also supports that results of 854 central venous catheters, 61 (7%) were used for TPN, during 4712 catheter days of observation, 89 catheters of all types were colonized. In this study also revealed that majority (32.88%) of respondents expressed the knowledge about common route for inserting CVP line through internal jugular vein which is evident in another study conducted and approached to internal jugular vein catheterization in the neck was used in 335 patients over a 12 months period. The success rate was 100% and there were no complications. It proved to be an easy technique to learn and

may be particularly useful in different and emergency situations (Dirksen K.A, 2004).

A study was carried out in Washington University, School of Medicine by Dr. H. Kollef in 2004 A.D and in his study, the finding showed that 74 episodes of catheter-associated bloodstream infection occurred in 7,879 catheter-days (9.4 per 1,000 catheter-days) in 24 months (John, 1998). Likewise, in our study we found that the infection is the second highest (20.32%) complication after CVP catheterization. (Rippe J. M., 2002)

Conclusion

Findings in general indicated that nurses in BPKIHS have knowledge regarding CVP. Overall finding projected that in comparison with nursing personnel working in ICCU/CCU have more knowledge regarding care of patient with CVP catheterization than nursing personnel working in Dialysis department of BPKIHS. In comparison to knowledge scoring and according to overall knowledge mean percentage score, nursing personnel working in ICCU/CCU had significantly better knowledge than those working in dialysis department.

Bibliography

David, A. e. (2003). *Oxford Text Book of Medicine* (4th ed., Vol. I).

Desousa K.A, e. a. (1997). Accurate placement of CVC. *Journal of Anesthesia , 5*, 17-9.

Dirksen K.A, e. a. (2004). *Medical-Surgical Nursing* (6th ed.). Lippincdott Williams and Wilikins, Philadelphia.

John, M. e. (1998). Central Venous Catheterization. *American Journal of Nursing , 50*, 281-7.

Justin B, S. S. (2003). Risk of Colonization of Centarl Venous Catheters. *American Journal of Critical Care , 12*, 328-335.

P., R. (2008). Central Venous Catheter.

Rippe J. M., &. I. (2002). *Intensive care medicine* (5th ed.). Phladelphia: Lippinccot Willians and Wilkins.

S., M. (2003). Knowledge of CVP among nursing personnel working at BPKMCH.