EFFECT OF PLANNED TEACHING ON KNOWLEDGE AND PRACTICE AMONG NURSES
REGARDING CARE OF CENTRAL VENOUS LINE

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Research Article

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ABSTRACT

Central venous line plays an important role in the management of intensive care unit patients, but it must be taken care off efficiently following all the universal precautions failing which may lead to life threatening complications. This can be achieved through planned teaching with demonstration of the procedure among the staff nurses of these care units. With this background researcher conducted a study *t*o assess the effect of planned teaching on knowledge and practice among nurses regarding care of central venous line. As per General System Model, the conceptual framework was formulated. The study based on Quasi-experimental research design. The tool consisted of three sections, demographic data, to assess the knowledge and to observe practices. Validation and reliability was checked and necessary changes carried out. Pilot study was conducted to see the feasibility of the tool. Non probability purposive sampling technique was adopted to collect 60 samples for the study, 30 samples each in experimental and control groups. Data were collected from selected Hospital of Pune city. Knowledge level and practices were assessed before the intervention followed by planned teaching on care of central venous line. Post test carried out after seven days of planned teaching **Results**: Findings related to knowledge of staff nurses regarding care of central venous line before and after planned teaching, were average and good respectively. Even in the practice they improved after demonstration form average to good. There was correlation between knowledge level and practices. However there was no association of them with the demographic variables

INTRODUCTION

"Quality is never an accident; it always the result of high intention, sincere effort, intelligent direction and skillful execution; it represents the wise choice of many alternatives."

Anatomically, insertion of a catheter into one of several easily located vessels allows access to the central venous circulation. One of the earliest published accounts in human, dates to a report by Dr. Forssmann in 1929 and (Kalso;1985) inserted a wide bore needle into his own left cubital fossa and used this access to advance a 4 French ureter catheter into his heart. He confirmed placement after climbing several flights of stairs to the radiology department. Subsequently various approach were developed that included establishing access via a jugular and subclavian insertion, (Duffey, 1949, Kalso 1985) The development of total parentral nutrition necessitated the need to provide central venous access, arteriovenous shunts among hemodialysis patients were unsuccessful, a Silastic Catheter which was advanced into the right atrium. After Six years (Hickman) this catheter modify increasing internal diameter by 0.10 millimeters. [1]

According to a study done by (Capaccioli L. *et al* in 1998) in Torino cases on long term central venous devices for chemotherapy, repeated blood transfusion ,or nutritional support suffered from infections with staphylococcus epidrmidis. [2]

MATERIALS AND METHODS

Quantitative approach with **Quasi Experimental design – pretest-posttest control group design** was adopted for the study. Non probability purposive sampling technique was adopted to collect 60 samples for the study, 30 samples each for the experimental and control groups. Pre-test was conducted for both the experimental and control groups to assess the knowledge and practices of staff nurses by using structured knowledge questioner and observational check list tool. After the pre-test, planned teaching was administered only to the experimental group. Post-test for both the experimental and control groups were carried out on the seven day after planned teaching. Data was analyzed by using descriptive and inferential statistics.

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Validity and reliability of the research tool was done. Formal administrative approval was obtained from Bharati Hospital and Research Centre, Pune, Smt. Kashibai Navale Hospital, Pune, and Rao nursing Home Pune. Sample selection was done by non-probability purposive sampling technique.

Researcher duly explained the purpose of the study. Confidentiality of the data was maintained strictly and informed written consent obtained. Demographic data was collected. Pre-test was conducted on staff nurses working in ICU for both the experimental and control groups by using structured knowledge questioner and observational check list tool. Planned teaching was administered only to the experimental group. The researcher was present for observing the practices of staff nurse both experimental and control group. Post-test for both the experimental and control groups were carried out on the seven day after planned teaching. The analysis include descriptive and inferential Statistics. Data was presented in tabular & graphical form. The chi-square, fisher exact test was use to find the significance difference of demographic variables between experimental and control group. Assessment of knowledge and practice score was calculated by no and percentage. Wilcoxon test was used to find the effectiveness of knowledge and practice score after post test. MW test was used to find the of knowledge and practice score according to demographic variables in experimental and control group. A probability value of 0.05 was accepted as the level of statistical significance.

Statistical analysis

Data was analyzed by using descriptive and inferential statistics. The chi-square, fisher exact test was use to find the significance of difference of demographic variables between experimental and control group.

Assessment of knowledge and practice score was calculated by frequency and percentage.

Wilcoxon test was used to find the effectiveness of knowledge and practice score after post test.

Man Whitney test was used to find the of knowledge and practice score according to demographic variables in both experimental and control group. A probability value of 0.05 was accepted as the level of statistical significance.

Findings related to demographic data of the sample

Table 1 Age wise distribution of cases in experiment and control group

N= 30+30

Age (Yrs)	Experiment		Control		Total	
	(f)	(%)	(f)	(%)	(f)	(%)
21 – 30	22	73.33	27	90	49	81.66
>30	8	26.66	3	10	11	18.33
Total	30	100	30	100	60	100

The above table depicts the age wise distribution of the nurses in control and experimental group. Maximum nurses in both the group were in the age group of 21 – 30yrs with 73.33% in experimental group and 90% in the control group and 26.66% and 10% were in the experimental group and control group respectively with the age of more than 30Years.
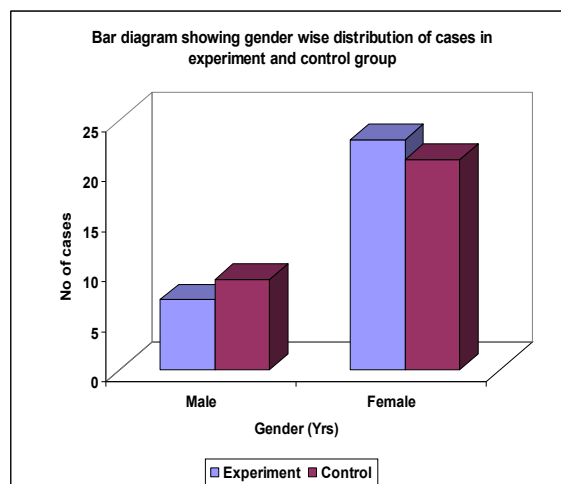

Fig 1 Gender distribution among nurses in both control and experimental group

N= 30+30

The fig two shows the gender distribution of the nurses under study. In the control group the females were more with 70% and in the male in control group was 30%. In the experimental group the female were again more with 76.66% and males were 23.33%.

Table 2: shows the demographic data of the nurses under study in both control and experimental group Based on the years of experience the maximum nurses were in 1-5 years of experience with 53.33% in the experimental group and 50% in the control group and with 6 – 10 years of experience the percentage was 23.33% and 43.33% in experimental and control group respectively. With more than 10 years of experience the percentage in experimental group was 23.33% and in control group the percentage was 6.66%

Based on the nurses professional qualification maximum nurses were general nursing midwife with 90% in experimental and 66.66% in control group and bachelors of nursing were 10% and 33.33% in experimental group and control group respectively

The additional courses attended by the nurses' shows that most of the nurses had not undergone any kind of special course. However nurses who have undergone diploma in critical care were 13.33% in experimental and 6.66% in control group; diploma in CVTS the percentage is 3.33% and 0% in experimental and control group respectively. Nurse who had undergone BLS and ACLS in experimental group were 10% and in control group it was 6.66%.

Section-II: Findings related to knowledge of nurses regarding care of central venous line before and after planned teaching.

Data Presented in table three depicts that in pre test 63.33% respondents had average knowledge in the experimental group whereas in post test all 30 (100%) had good knowledge. In contrast the control group had 5 (16.67%) respondents with good knowledge score and in the post test the same group had 10 (33.33%) respondents with good knowledge despite not getting any planned teaching. This difference in knowledge

score probably may be due to personal interest generated among the participants after the pretest.

post test 100% respondents had good practice score in experiment group.

Table 2 Demographic variables of nurses in control and experimental group

N = 30 +30

	Experiment		Control		Total	
	(f)	(%)	(f)	(%)	(f)	(%)
Yrs in experience						
1 – 5	16	**53.33**	15	**50**	31	**51.66**
6 – 10	7	**23.33**	13	**43.33**	20	**33.33**
>10	7	**23.33**	2	**6.66**	9	**15**
professional qualification						
GNM	27	90	20	66.66	47	78.33
B Sc	3	10	10	33.33	13	21.66
Additional courses attended						
Dip. Critical care	4	13.33	2	6.66	6	10
Dip. CVTS	1	3.33	0	0	1	1.66
BLS, ACLS	3	10	2	6.66	5	8.33
No courses	22	73.33	26	86.66	48	80

Table 3 Frequency distribution of respondents according to pre and post test Knowledge score

N= (n1+n2)=60

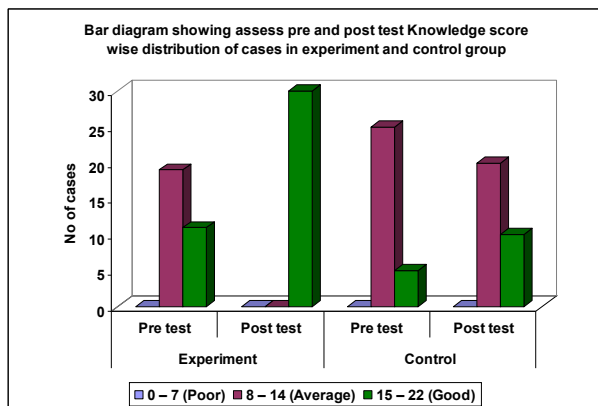|	Experimental group (n1)				Control group(n2)			
Knowledge score	Pre test		Post test		Pre test		Post test	
	(f)	(%)	(f)	(%)	(f)	(%)	(f)	(%)
0 – 7 (Poor)	0	0	0	0	0	0	0	0
8 – 14 (Average)	19	63.33	0	0	25	83.33	20	66.67
15 – 22 (Good)	11	36.67	30	100	5	16.67	10	33.33
Total	30	100	30	100	30	100	30	100

Fig2 Bar diagram showing the pre and post test score level on knowledge of both experimental and control group

N = 30 + 30

The figure two depicts the score of the knowledge level in both control and experimental group. The score before the intervention which is pretest shows that maximum had average level and good knowledge was seen among eleven nurses and in post test it is seen all had good knowledge after the planned teaching as intervention with demonstration.

In control group twenty five nurses had average knowledge and five nurses had good knowledge level and after intervention the knowledge level in post test was twenty had average knowledge and ten had good knowledge.

Section-III: Findings related to practices of staff nurses regarding care of central venous line before and after planned teaching.

In pre test 93.33% respondents having average score in practice and 6.67% respondents having good score of practice. After

In control group 60% respondents having average practice score in pre test and 40% respondents had good practice score. After post test 50% respondents having average and 50% were having good practice score.

Table 4 distribution of respondents in experimental and control group as per pre and post test score of practice regarding care of Central Venous line.

	Experimental group (n1)				Control Group (n2)			
Practice score	Pre test		Post test (%)		Pre test (%)		Post test (%)	
	(f)	(%)	(f)	(%)	(f)	(%)	(f)	(%)
0 – 10 (Poor)	0	0	0	0	0	0	0	0
11 – 20 (Average)	28	93.33	0	0	18	60	15	50
21 – 31 (Good)	2	6.67	30	100	12	40	15	50
Total	30	100	30	100	30	100	30	100

Section-IV: Findings related to comparison of the knowledge and practices among nurses regarding care of central venous line before and after planned teaching.

Table 5 Comparison of pre and post test Knowledge score in experimental and control group

N=30+30

Parameters	Pre test	*Post test*	Wilcox on Z Value	P Value
	Mean ± SD	*Mean ± SD*		
Knowledge score Experimental	14.17 ± 2.73	20.20 ± 0.99	4.79	<0.0001
Knowledge score Control	13.07 ± 1.66	13.73 ± 1.44	2.39	<0.05

Data presented in table five shows that Knowledge score were highly improved after post test as compare pre test in experimental group as, p value <0.0001 So it shows the planned health teaching is significantly effective. Knowledge score were slightly improved after post test as compared to pre test score in control group, at p value <0.05 This difference in knowledge score probably be due to personal interest generated among the participants

Table 6 Comparison of pre and post test Practice score in experimental and control group

N= 30+30

Parameters	Pre test	*Post test*	Wilcoxon Z Value	P Value
	Mean ± SD	*Mean ± SD*		
Practice score in experimental group	16.70 ± 2.52	27.30 ± 1.18	4.79	<0.0001
Practice score in control group	19.90 ± 2.56	20.17 ± 2.81	1.40	>0.05

Data presented in table 6 shows that Practice score were highly improved after post test as compare to pre test in experimental group, as p value <0.0001. So that planned teaching is significantly effective.

Data presented in table 7 shows that Practice score were slightly improved after post test as compare pre test in control group, as p value >0.05 This difference in practices score probably be due to personal interest generated among the participants.
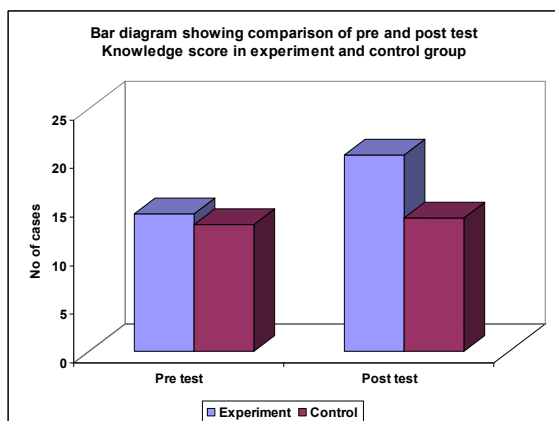

Fig 3 Bar diagram showing the comparison of pre and post knowledge score in the experimental and control group
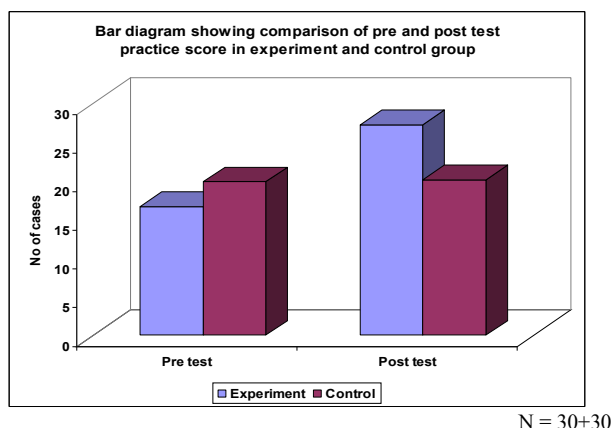
N = 30+30

Fig 4 Bar diagram showing the comparison of pre and post test practice scores in both experimental and control group

N = 30+30

Section-V: Findings related to comparison of selected demographic variables with the level of knowledge and practices.

The table shows the p value of the demographic variables with knowledge in both experimental and control group is more than 0.05 thus there is no association between them.

The table shows the p value of the demographic variables with practice in both experimental and control group is more than 0.05 thus there is no association between the them.

DISCUSSION

The findings of the study was discussed with the objectives and hypothesis stated. The present study was undertaken to assess the effect of planned teaching on knowledge and practices among staff nurses regarding care of central venous line. The scores were found to be significantly improved on knowledge and practices of staff nurses regarding care of central venous line.

These findings are in line with the study conducted by, East D, Jacoby K. studied the effect of a nursing staff education program on compliance with central line care policy in the cardiac intensive care unit. A self-study module was distributed among registered nurse on complications related to central venous line use are known to increase patient morbidity ,mortality, increase costs and length of hospital stay. Education programs to promote best central line practice have been shown to reduce central line complications. The purpose of this research was to demonstrate the effectiveness of an education module on staff compliance regarding central line care policy in the paediatric cardiovascular intensive care unit (CVICU). A quasi-experimental pre and post-test design was conducted in the CVICU at a major paediatrics hospital in the Southwest. Pre and post-test results were used to analyze the effectiveness of the education module. Compliance with central line care policy was scored as a "yes" or "no" based upon 10 observable policy requirements. Data was collected on 47 patients over a 1 to 2-month period pre and post intervention during rounds in the CVICU. Results show a marked improvement in compliance with policy. [3]

Table 7 Association between pre test scores of knowledge in both experimental and control group with selected demographic variables

N =30 +30

Demographic data	Knowledge score	Mean ± SD	Mean ± SD	MW test Z Value	P Value
		Age (21 – 0Yrs)	Age (>30 Yrs)		
Age	Pre test Experimental	13.68 ± 2.34	15.50 ± 3.42	1.18	>0.05
	Pre test Control	12.96 ± 1.63	14 ± 2	0.89	>0.05
		Male	Female		
Sex	Pre test experimental	14.43 ± 1.90	14.09 ± 2.97	0.47	>0.05
	Pre test Control	12.89 ± 1.54	13.14 ± 1.74	0.49	>0.05
		</= 5Yrs	> 5Yrs		
Years of Experience	Pre test Experimental	13.44 ± 2.39	15 ± 2.93	1.18	>0.05
	Pre test Control	12.93 ± 1.83	13.20 ± 1.52	0.19	>0.05
		GNM	BSC Nursing		
Professional qualification	Pre test Experimental	14.22 ± 2.76	13.67 ± 2.89	0.48	>0.05
	Pre test Control	13.10 ± 1.62	13 ± 1.83	0.04	>0.05
		Yes	No		
Additional courses attended	Pre test Experimental	12.88 ± 2.42	14.64 ± 2.73	1.80	>0.05
	Pre test Control	13.50 ± 1.73	13 ± 1.67	0.66	>0.05

Table 8 Association between pre test scores of practice in both experimental and control group with selected demographic variables

N =30 +30

Demographic data	Practice Score		MW test Z Value	P Value
	Experimental Mean ± SD	Control Mean ± SD		
Age – 21 - 30	16.59 ± 2.46	20 ± 2.63	0.000	>0.05
Age - >30	17 ± 2.83	19 ± 2	0.66	>0.05
Sex Male	16.86 ± 1.77	19.78 ± 2.39	0.29	>0.05
Sex Female	16.65 ± 2.74	19.95 ± 2.69	0.09	>0.05
Years of Experience </= 5Yrs	16.50 ± 2.37	20.53 ± 2.36	0.38	>0.05
Years of experience > 5 years	16.93 ± 2.76	19.27 ± 2.68	1.64	>0.05
Professional qualification GNM	16.59 ± 2.29	20.20 ± 2.61	0.04	>0.05
Professional qualification BSc Nursing	17.67 ± 4.73	19.30 ± 2.49	0.69	>0.05
Additional courses attended – Yes	15.88 ± 3.60	18.50 ± 2.64	1.30	>0.05
Additional courses attended - No	17 ± 2.02	20.12 ± 2.53	1.14	>0.05

This study has showed that there is variation in the infection prevention approach and nurses knowledge about catheter-related blood stream infection prevention.

CONCLUSION

During the past half century, the multiple technical and technological achievements leading to the development of safe long term chronic vascular access have had significant effects in salvaging or prolonging the lives of countless patients.

A Central Venous Catheter, or Vascular access device (VAD) is a long thin, flexible tube used to give medications, fluids, nutrients or blood products over a long period of time, usually several weeks or more. The catheter is inserted through the skin into a vein often in the neck or chest. It is treated through the vein until it reaches a large vein near the heart.

Central Venous Catheters (CVC) have provided many benefits in modern day, medical practice; however they also put patients at risk for catheter related complications.

Numerous studies have been carried out in relation to the management of CVC with conflicting results. While there were several systematic reviews of CVC related issues.

This systematic review concluded that there is a need for well designed control trials with sufficient power to determine the effectiveness of various interventions in relation to management of Central Venous Catheter.

Future Scope

Keeping in view the findings of the present study, the following recommendations are made:

1. A study can be done to prepare and find out the effect of protocol for care of patient with C V P line.
2. Exploratory study to find out the factors that hinders the nurses in providing the quality nursing care to patients with CVP lines.
3. A study to find out the effectiveness of protocol for change of flush solution and central catheter of pressure line can be done.
4. A study to prepare the staff nurses to dessiminate information about CVP care and effects can be done.

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