Effect of Structured Education on Venous Access Devices (VADS) Among Staff Nurses Working in Selected Tertiary Care Hospitals of Maharashtra

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Abstract: Background of the study: Venous access devices are frequently required to hospitalized patients for a variety of clinical indications. This requirement may range from short term or temporary need to long term or even permanent access. A variety of vascular access options are available to the physicians who care for patients to meet the required treatment needs. Over the last four decades, VADs have become a standard component of caring for patients with cancer in all settings. Despite the common use of VADs, the current standardized procedures for maintenance care and managing complications is limited. The key to establishing evidence to support practice lies in the further development of nurse, scientist, and clinician collaborations to implement multisite research. It is only through evidence-based findings that traditional practice will be challenged and practice controversies will be resolved. Objective: The objective of the study was to assess the effect of structured education on VADs among staff nurses working in selected tertiary care hospitals. A quantitative approach and quasi experimental with non-randomized control group design was used to carry out this study. The staff nurses were selected by convenient sampling technique where data was collected by using self administered questionnaire (SAQ). The analysis was done by using descriptive and inferential statistics. Results: The age group 21-30 years has 19 participants (20.0%) in both groups, totaling 38 (20.0%). The 31-40 years group includes 32 participants (33.7%) in each group, totaling 64 (33.7%). The 41-50 years category has 22 participants (23.2%) in the control group and 25 (26.3%) in the experimental group. 42 males (44.2%) are in the control group and 43 males (45.3%) in the experimental group, making a total of 85 males (44.7%). Similarly, 53 females (55.8%) are in the control group and 52 females (54.7%) in the experimental group, totaling 105 females (55.3%). 17 Hindus (17.9%) are in the control group and 16 Hindus (16.8%) in the experimental group, totaling 33 Hindus (17.4%). 24 Buddhists (25.3%) are in the control group and 28 Buddhists (29.5%) in the experimental group. 37 participants (38.9%) in both groups hold a GNM (General Nursing and Midwifery) qualification, totaling 74 (38.9%). 33 participants (34.7%) in the control group and 37 participants (38.9%) in the experimental group have a B. Sc Nursing qualification, summing up to 70 (36.8%). 25 participants (26.3%) in the control group and 21 participants (22.1%) in the experimental group hold a P.B. B. Sc (Post Basic B. Sc Nursing) qualification, totalling 46 (24.2%). 91 participants (47.9%) have 1-5 years of experience, with a higher proportion in the experimental group (57.9%) compared to the control group (37.9%). 52 participants (27.4%) have 5-10 years of experience, with similar proportions in both groups (28.4% in control and 26.3% in experimental). The majority of participants (117, 61.6%) have an income between Rs. 20,000- 30,000, with 63.2% in the control group and 60.0% in the experimental group. There was a significant difference between pretest and post- test knowledge scores in experimental group. And, there was also a significant difference between the post tests of control and experimental group. Inferential analysis reveals that there is association of knowledge with age, religion, Job experience, and there is no association of knowledge score with any other demographic variable. Conclusion: The findings of present study, was concluded that the demo- graphic variables of staff nurses in control and experimental group were more or less similar, revealing both the groups had similar characteristics. Percentage of knowledge and the mean scores of staff nurses were more or less similar in both the groups before intervention. However, after an intervention, the percentage of knowledge and the mean scores of staff nurses were significantly increased in experimental group whereas it was remained unchanged in control group. There was a significant difference between pretest and post- test knowledge scores in experimental group. And, there was also a significant difference between the post tests of control and experimental group. Thus, it was concluded that structured education on venous access

devices was effective among staff nurses working in selected tertiary care hospitals, Maharashtra

Keywords: venous access devices (VAD), structured education, staff nurses, tertiary care hospitals.

INTRODUCTION

Venous access devices (VADs) play a crucial role in healthcare by providing a means to access a patient's bloodstream for various medical purposes. These devices are essential for delivering medications, fluids, blood products, and other treatments directly into the bloodstream, as well as for obtaining blood samples for diagnostic purposes. Venous access devices are particularly important in situations where long- term or repeated access to the vascular system is necessary.[1] Central venous access devices (CVADs) or central venous catheters (CVCs) are devices that are inserted into the body through a vein to enable the administration of fluids, blood products, medication and other therapies to the bloodstream.[2] Venous access devices are indispensable tools in modern healthcare, providing essential access to the bloodstream for a wide range of medical treatments. Understanding the different types of VADs, their indications, benefits, and challenges is crucial for healthcare professionals to ensure safe and effective delivery of intravenous therapy to patients across diverse clinical settings.[3] Some of the treatment you require will need to be given directly into your bloodstream. In order to do this, we will place a device into your vein, called a venous access device. This enables us to have access to your venous system to give your treatment.[8] Venous access devices that can be implanted under the skin were introduced in 1982. They allow medications to be delivered directly into larger veins, are less likely to clot, and can be left in for long periods. Central venous access devices are small, flexible tubes placed in large veins for people who require frequent access to the bloodstream.[9]

OBJECTIVES

Primary objective was used to find out the effect of structured education on VADs among staff nurses working in selected tertiary care hospitals, Maharashtra.

SECONDARY OBJECTIVE:

1. To assess the knowledge scores on VADs among staff nurses working in selected tertiary care hospitals in control and experimental group before intervention
2. To find out the effect of structured education between pretest and post test knowledge scores on VADs among staff nurses working in selected tertiary care hospitals in control and experimental group
3. To find out the effect of structured education between post test knowledge scores on VADs among staff nurses working in selected tertiary care hospitals in control and experimental group
4. To find out the association between post test knowledge scores on VADs among staff nurses working in selected tertiary care hospitals and their demographic variables in control and experimental group

MATERIALS AND METHODS

A quantitative approach was adopted and non-randomized control group design was used for this study. The study was carried out in the selected tertiary care hospitals of Maharashtra. The period of data collection was three weeks. The permission was obtained from authorities concerned of selected tertiary care hospitals. The convenient sampling technique was used to select 190 staff nurses from different hospitals. Written consent was obtained from the samples and pretest has been assessed for all the 190 staff nurses using demographic and self-administered questionnaire for assessing knowledge. Then the structured education was given for all staff nurses to whom the pre-test was conducted. After 7 days, the post-test was taken and the data was analysed. **Statistical Analysis** The data was analysed by descriptive and inferential statistics. Demographic data was analysed using frequency and percentage, data from the questionnaire before and after structured education was also analysed using frequency, percentage and t test. The association between knowledge findings and demographic variables was found by using t test and chi-square test.

RESULTS

Table 1: Percentage wise distribution of staff nurses according to their demographic characteristics

n=190

Demographic Variables	Experimental Group(n=75)	Control Group(n=75)
Age(yrs)		
21-30 yrs	19(20.0%)	19(20.0%)

31-40 yrs	32(33.6%)	32(33.7%)
41-50 yrs	22(23.2%)	25(26.3%)
51and above	22(23.2%)	19(20.0%)
Gender		
Male	42(44.2%)	43(45.3%)
Female	53(55.8%)	52(54.7%)
Religion		
Hindu	17(17.9%)	16(16.8%)
Buddhist	24(25.3%)	28(29.5%)
Christian	54(56.8%)	51(53.7%)
Others	95(100.0%)	95(100.0%)
Professional qualification		
GNM	37(38.9%)	37(38.9%)
B.sc nursing	33(34.7%)	37(38.9%)
P. B. B. Sc nursing	25(26.4%)	21(22.2%)
m.sc nursing	95(100.0%)	95(100.0%)
Job experience		
1-5 year	36(37.9%)	55(57.9%)
5-10 year	27(28.4%)	25(26.3%)
10-15 year	11(11.6%)	15(15.8%)
15 year and above	21(22.1%)	0(0.0%)
Income(monthly)		
10000- 20,000	13(13.7%)	6(6.3%)
20,000- 30,000Rs	60(63.2%)	57(60.0%)
30,000-40,000Rs	9(9.5%)	15(15.8%)
40,000 & above	13(23.7%)	17(17.9%)

Table 2: Assessment of the evaluation effectiveness of pre & post- test Score among staff nurses in selected hospital. (using paired Sample T-test)

n=95

		Mean	N	Std. Deviation	Std. Error Mean	df	T-test	P- value
Knowledge	Pre	15.6158	190	7.00452	0.50816	189	- 53.247	<0.001
	Post	18.1211	190	6.87231	0.49857			

The table presents a paired t-test analysis comparing pre-test and post-test knowledge scores. The mean pre- test score was 15.62 (±7.00), while the mean post-test score increased to 18.12 (±6.87), indicating an improvement in knowledge after the intervention. The standard error of the mean for the pre-test was 0.50816, and for the post-test, it was 0.49857. With 189 degrees of freedom (df), the calculated t-value was -53.247, and the p-value was <0.001, indicating a highly significant difference between pre-test and post-test scores. This suggests that the structured education had a significant positive impact on knowledge levels.

Table 3: Significance of difference between knowledge Score in Pre and post-test of staff nurses - Assessment of effectiveness of structured education between post-test on Vads among staff nurses in selected tertiary care hospitals. (using Independent Sample T-test)

n=95

		N	Mean	Std. Deviation	St d. Err or Me an	F-test	T-test	df	P-value
Post Test	Control	95	2.3789	0.48770	0.05004	13.1 2	- 23.7 88	188	<0.001
	Experiment al	95	4.3684	0.65319	0.06702				

The table presents an independent t-test analysis comparing post-test scores between the control and experimental groups. The mean post-test score for the control group was 2.38 (±0.49), whereas for the experimental group, it was 4.37 (±0.65). The standard error of the mean was 0.05004 for the control group and 0.06702 for the experimental group. The F-test value was 13.12, and the t-value was -23.788 with 188 degrees of freedom (df). The p-value <0.001 indicates a highly significant difference between the two groups, suggesting that the intervention had a substantial positive impact on the experimental group.

Table 4: Comparative assessment of Knowledge category vs demographic variables using Chi- Square Analysis.

n=150

			Knowledge Category				Total	Chi Sq	P-value
			Poor	Average	Good	Very Good			
AGE	21-30	Frequency	10	12	8	8	38	8.188	0.49
		%	16.9%	26.7%	19.0%	18.2%	20.0%		
	31-40	Frequency	17	18	12	17	64		
		%	28.8%	40.0%	28.6%	38.6%	33.7%		
	41-50	Frequency	15	8	11	13	47		
		%	25.4%	17.8%	26.2%	29.5%	24.7%		
	51 and above	Frequency	17	7	11	6	41		
		%	28.8%	15.6%	26.2%	13.6%	21.6%		
Total		Frequency	59	45	42	44	190		
		%	100.0%	100.0%	100.0%	100.0%	100.0%		

			Knowledge Category				Total	Chi Sq	P-value
			Poor	Average	Good	Very Good			
GENDE R	Male	Frequency	27	18	21	19	85	0.947	0.814
		%	45.8%	40.0%	50.0%	43.2%	44.7%		
	Female	Frequency	32	27	21	25	105		
		%	54.2%	60.0%	50.0%	56.8%	55.3%		
Total		Frequency	59	45	42	44	190		
		%	100.0 %	100.0%	100.0 %	100.0%	100.0 %		

			Knowledge Category				Total	Chi Sq	P- value
			Poor	Average	Good	Very Good			
RELIGION	Hindu	Frequency	13	6	5	9	33	4.075	0.49
		%	22.0%	13.3%	11.9%	20.5%	17.4%		
	Buddhist	Frequency	16	10	14	12	52		
		%	27.1%	22.2%	33.3%	27.3%	27.4%		
	Christian	Frequency	30	29	23	23	105		
		%	50.8%	64.4%	54.8%	52.3%	55.3%		
Total		Frequency	59	45	42	44	190		
		%	100.0%	100.0%	100.0%	100.0%	100.0%		

			Knowledge Category				Total	Chi Sq	P- value
			Poor	Average	Good	Very Good			
JOB EXPERIENCE	1-5 years	Frequency	18	21	26	26	91	31.107	<0.01
		%	30.5%	46.7%	61.9%	59.1%	47.9%		
	5-10 years	Frequency	18	13	9	12	52		
		%	30.5%	28.9%	21.4%	27.3%	27.4%		
	10-15 years	Frequency	7	6	7	6	26		
		%	11.9%	13.3%	16.7%	13.6%	13.7%		
	15 years and above	Frequency	16	5	0	0	21		
		%	27.1%	11.1%	0.0%	0.0%	11.1%		
Total		Frequency	59	45	42	44	190		
		%	100.0%	100.0%	100.0%	100.0%	100.0%		

			Knowledge Category				Total	Chi Sq	P-value
			Poor	Average	Good	Very Good			
PROFESSION AL QUALIFICATI ON	GNM	Frequency	23	18	19	14	74	2.288	0.891
		%	39.0%	40.0%	45.2%	31.8%	38.9%		
	B.Sc. Nursing	Frequency	20	17	15	18	70		
		%	33.9%	37.8%	35.7%	40.9%	36.8%		
	P.B.B.S C	Frequency%	16	10	8	12	46		
			27.1%	22.2%	19.0%	27.3%	24.2%		
Total		Frequency	59	45	42	44	190		
		%	100.0 %	100.0%	100.0 %	100.0 %	100.0 %		

			Knowledge Category				Total	Chi Sq	P- value
			Poor	Average	Good	Very Good			
INCOM E	Rs. 10,000- 20,000	Frequency	7	7			19	12.273	0.198
		%	11.9%	15.6%	2.4%	9.1%	10.0%		
	Rs. 20,000- 30,000	Frequency	35	31	25	26	117		
		%	59.3%	68.9%	59.5%	59.1%	61.6%		
	Rs. 30,000- 40,000	Frequency	6	3	6	9	24		
		%	10.2%	6.7%	14.3%	20.5%	12.6%		
	Rs. 40,000 and above	Frequency	11	4	10	5	30		
		%	18.6%	8.9%	23.8%	11.4%	15.8%		
Total		Frequency	59	45	42	44	190		
		%	100.0%	100.0%	100.0%	100.0%	100.0%		

Above tables shows there is association of knowledge with age, religion, Job experience, and there is no association of knowledge score with any other demographic variable.

DISCUSSION

Highest percentage (33.7%; 33.7%) were belonged to the age group of 31-40 years in control & experimental group respectively. Highest percentage (55.8%;54.7%) were belonged to the female in both the group. Highest percentage (53.7%;56.8%) were belonged to the Christian Staff nurses in experimental and control group respectively. Highest percentage (31.8%;45.2%) were belonged to the GNM staff nurses in experimental and control group respectively. Highest percentage (59.1%;61.9%) were belonged to the 01-5 years of work experience in experimental and control group respectively. Highest percentage (60.00%;63.2%) were belonged to the 20000 – 30000 income of nurses in experimental and control group respectively. Knowledge score on venous access devices among staff nurses in experimental group is more less that the controlled group before intervention respectively. Pre-test and post-test percentage of knowledge score were more or less similar in control group whereas post-test knowledge score in experimental group was significantly increased from 15.61 % to 18.12% making a difference in the knowledge percentage. Pre-test and post-test mean knowledge scores were more or less similar in control group whereas post-test mean knowledge score in experimental group was increased from 15.61±7.0045 to 18.12 ± 6.8723making a huge difference in the mean knowledge scores. Highly significant difference ($p<0.001$) was found with a 't' value of -23.788 between a pre-test & post-test knowledge score in experimental group whereas the calculated 't' value of – 53.247 between a pre-test and post-test knowledge score shows not significant difference in control group. Highly significant difference ($p<0.001$) was found with a 't' value of -23.788 between post-test of control group & experimental group. There is a association of knowledge with age, religion, Job experience, and there is no association of knowledge score with any other demographic variable.

CONCLUSION

From the findings of present study, it was concluded that the demo- graphic variables of staff nurses in control and experimental group were more or less similar, revealing both the groups had similar characteristics. Percentage of knowledge and the mean scores of staff nurses were more or less similar in both the groups before intervention. However, after an intervention, the percentage of knowledge and the mean scores of staff nurses were significantly increased in experimental group whereas it was remained unchanged in control group. There was a significant difference between pretest and post- test knowledge scores in experimental group. And, there was also a significant difference between the post tests of control and experimental group. Thus, it was concluded that structured education on venous access devices was effective among staff nurses working in selected tertiary care hospitals, Maharashtra.

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