International Journal of Trend in Scientific Research and Development (IJTSRD)
Volume 9 Issue 3, May-Jun 2025 Available Online: www.ijtsrd.com e-ISSN: 2456 – 6470

A Study to Evaluate the Effectiveness of Self-Instruction Module on Knowledge Regarding of Central Venous Pressure Monitoring by CVP Manometer among Staff Nurses Who Have Working in Micu in Selected Hospital, Jaipur

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ABSTRACT

Central lines or central venous pressure (CVP) lines are placed to allow access to the central venous circulation. They have several functions, such as venous access for administration of drugs/fluids/feeding and monitoring. Several other types of intravenous catheter exist and principles for interpretation of radiographs following insertion of these lines are the same.

The analysis shows that the total knowledge scores of the pre-test, out of 60 subjects majority 35 (58.3%) of respondents had Inadequate knowledge scores, 19 (31.7%) them had moderate scores, 6(10.00%) of them had adequate knowledge scores level regarding central venous pressure monitoring by CVP manometer. However, after administration of SIM, post-test out of 60 subjects, majority 42 (70.0%) he respondents had adequate knowledge score and 12(20.0%) Moderate Xiii knowledge scores and 6 (10.0%) average knowledge scores regarding central venous pressure monitoring by CVP manometer among MICU staff nurses. The overall pre-test and post-test mean are 13.73 and 22.98 with SD of 4.42 and 3.87, respectively and 't' value 12.45 which was highly significant at P<0.05 level. This was proved and accepted the formulated hypothesis. Chi square was computed the association between post-test level of knowledge with selected variables in that the age, education, work experience and prior in-service education of MICU staff nurses which is significantly associated at P<0.05 level, hence it is tested and proved hypothesis.

KEYWORDS: *knowledge, Central Venous Pressure, manometer, staff nurses, MICU*

How to cite this paper: Mr. Abdul Wahid "A Study to Evaluate the Effectiveness of Self-Instruction Module on Knowledge Regarding of Central Venous Pressure Monitoring by CVP Manometer among Staff Nurses Who Have Working in Micu in Selected Hospital, Jaipur" Published in International Journal of Trend in Scientific Research and Development (ijtsrd), ISSN: 2456-6470, Volume-9 | Issue-3, June 2025, pp.561-574, URL: www.ijtsrd.com/papers/ijtsrd80015.pdf

IJTSRD80015

INTRODUCTION

Monitoring is the observation of a disease, condition or one or several medical parameters over time. It can be performed by consciously measures certain parameters by using a medical monitors and/or by repeatedly performing medical tests. It include cardiac monitoring, hemodynamic monitoring, neurological monitoring, blood glucose monitoring, childbirth monitoring, body temperature monitoring. Monitoring of vital parameter can include several of the ones mentioned above, and most commonly include at least blood pressure and heart rate and preferably also pulse oximetry and respiratory rate.

The central venous pressure (CVP) is the pressure measured in the central veins close to the heart. It indicates mean right atrial pressure and is frequently used as an estimate of right ventricular preload. The CVP does not measure blood volume directly, although it is often used to estimate this. In reality the CVP value is determined by the pressure of venous blood in the vena cava and by the function of the right heart, and it is therefore influenced not only by intravascular volume and venous return, but also by venous tone and intra thoracic pressure, along with right heart function and myocardial compliance.

Positive end-expiratory pressure (PEEP) in patients under mechanical ventilation can affect CVP via increasing intra-thoracic pressure. Various reports exist on the direct relationship between the 2 pressures. yet, there is no accurate formula or solution based on PEEP level for adjusting CVP in patients under mechanical 2 ventilation. Yang et al. showed that a 0.38 cmH2O increase in PEEP leads to 1 cmH2O rise in CVP. A study on 70 cardiac surgery patients in 2007 showed that mean CVP of the patients in 0, 5, and 10 cmH2O PEEPs are 11, 12, and 14 cmH2O, respectively.

The first recorded placement of a central venous cannula in a human occurred in 1929, when Werner Forssmann cannulated himself by passing a catheter from his own left cephalic vein into his right atrium. Since this time the insertion of central venous catheters has become an important skill for all hospital doctors to obtain. Cannulation of a central vein has many uses, particularly in critically ill patients, including monitoring the cardiovascular system, providing a route for intravenous access when peripheral venous access is impossible or inappropriate, allowing temporary renal replacement therapy and providing a conduit for the insertion of\ temporary cardiac pacing wires. However the need for central vein cannulation often occurs in urgent or emergent situations which are not ideal learning environments.

Central Venous Pressure Monitoring, Hemodynamic monitoring is needed in up to 58% of patients presented to the emergency department. Generally, there are several methods of CVP measurement, which can be categorized as invasive and non-invasive. Currently two methods are available for direct and invasive measurement of CVP. In the first method, after fixing a CV line catheter, CVP is measured using a CVP manometer connected to patient's CV line. In the other method, an electronic transducer, connected to the CV catheter from one side and to the digital monitor from the other, is used to demonstrate measured CVP. There are also non-invasive methods such as direct observation and ultrasonography, which are used for indirect measurement of CVP. If the jugular vein appears larger than the adjacent common carotid artery when the patient is in a semi upright position, CVP is probably >10 cmH2O. Another method of measurement is plethysmography.

NEED OF THE STUDY:

The past 20 years has witnessed a tremendous growth in the use of technology associated with central venous access. This growth is evident in both the hospitalized and home care patient populations. Central venous access presents a unique challenge to nurses. Effectively meeting this challenge translates to improved patient care. The ability to recognize and treat complications such as catheter occlusion begins with education. Central venous access provides the nurse a wide range of opportunities for improving patient care. Quality assurance activities provide a systematic method for evaluating problems and managing solutions. Research activities have enhanced patient care and the understanding of vascular access complications. Nurses are in a key position to recognize catheter occlusions and institute appropriate treatments.

Central venous access provides the nurse a wide range of opportunities for improving patient care. Quality assurance activities provide a systematic method for evaluating problems and managing solutions. Research activities have enhanced patient care and the understanding of vascular access complications. Nurses are in a key position to recognize catheter occlusions and institute appropriate treatments.

A catheter is introduced into the vena cava through the internal jugular, subclavian, basilic or femoral veins. If the cannula is connected to a pressure transducer and monitor, the mean CVP can be recorded, which reflects competence of the right heart. A standard reference point is usually the mid axillary line or a point 5 cm below the sternum. The CVP depends on venous return, blood volume, right ventricular compliance, right ventricular contractility, and intra-thoracic pressure.

There is wide variation in the quality of assessment, monitoring and documentation of parameters, due to a range of factors including intra and inter- observer reliability, equipment malfunction and patient preparation. Education of nurses and other health workers in the physiological and technical rationale underpinning the collection of vital signs data and other significant alterations remains as an important challenge.

OBJECTIVES-

Objectives of the study

1. To assess the prior knowledge of MICU staff nurses regarding central venous pressure monitoring by CVP manometer.
2. To assess the post-test knowledge of MICU staff nurses regarding central venous pressure monitoring by CVP manometer.
3. To find out the effectiveness of self-instruction module on knowledge regarding central venous pressure monitoring by CVP manometer by comparing pre-test and post-test knowledge score.

4. To find the association between pre-test knowledge of MICU staff nurses regarding central venous pressure monitoring by CVP manometer with their selected demographic variables.

OPERATIONAL DEFINITION:

- **Assess:**

It is statistical measurement of knowledge of MICU staff nurses regarding central venous pressure observed by self-instruction module.

- **Effectiveness:**

In this study 'effectiveness' means it is the outcome of self-instruction module regarding central venous pressure monitoring by CVP manometer, which is measurable in terms of gaining knowledge score of MICU staff nurse based on given questionnaire.

- **Self-Instruction Module:**

It is a booklet in English prepared by the investigator for the MICU staff nurses, which covers the purposes, procedure and complications of CVP monitoring.

- **Knowledge:**

It is the awareness of MICU staff nurses regarding central venous pressure monitoring by CVP manometer.

- **Prevalence:**

The proportion of nurses having central venous pressure when compared to the total samples of the study.

- **Central venous pressure:**

It refers to the assessment of pressure recorded by the introduction of a catheter into the right atrium in order to monitor the condition of the patient.

- **Manometer:**

A manometer is a device to measure pressures; a common simple manometer consists of a 'U' shaped tube of class filled with some liquid. Typically the liquid is mercury because of its high density.

- **MICU staff nurses:**

A registered nurse working in the department of general or specialized MICU of the selected hospital for at least past one year.

- **Hospital:**

It refers to a private multi-specialty hospital, Jaipur

HYPOTHESIS:

All hypotheses will be tested at 0.05 level of significance.

- **H1-** Mean post-test knowledge score of MICU staff nurse regarding central venous pressure monitoring by CVP manometer will be significantly higher than the mean pre-test knowledge score.
- **H2**- There will be significant association between pre-test Knowledge score of MICU staff nurses regarding central venous pressure monitoring by CVP manometer with their selected demographic variables

RESEARCH APPROACH –

Research approach is a systemic, controlled empirical and critical investigation of natural phenomena guided by theory and hypotheses about the presumption relations among the phenomena.

Kerlinger

Research approach refers to the approach or the methodology that has been adopted to conduct the research. It basically involves the selection of research questions and the selection of appropriate research method such as primary research, secondary research etc. In the present study an evaluative approach was used to assess the effectiveness of self-instruction module on central venous pressure monitored by CVP manometer among staff nurses who have working in medical intensive care unit in selected hospital, Jaipur.

RESEARCH DESIGN-

The term research design refers to the investigators overall plan for obtaining answer to the research questions or for testing the research hypothesis. Research design spells out the strategies that the researcher adopts to develop information that is accurate and interpretable.

The research design is needed because it facilitates the smooth sailing of the various research operations, thereby making research as efficient as possible yielding maximal information with minimal expenditure of effort, time and money.

The research design selected for this study was pre experimental one group pre- test - post-test design. In one group pre-test –post-test design the investigator introduce base measure before and after planned exposure, which is depicted in O1 and O2 respectively. In this study the base measure was questionnaire on central venous pressure monitored by CVP manometer among MICU staff nurses. The administration of self-instruction module is depicted as 'X'.

The study design as follows:

1. O1: The pre-test, carried out for the assessment of the knowledge of MICU staff nurses regarding central venous pressure monitored by CVP manometer using structured knowledge questionnaire on day 1, day 2, in MANIPAL HOSPITAL and day 3, day 4, in MARUDHAR HOSPITAL JAIPUR.

2. X: Administration of self-instruction module to the MICU staff nurses on 7 day.
3. O2: The post-test, carried out for the assessment of the knowledge of MICU staff nurses regarding central venous pressure monitored by CVP manometer by administering the same structured knowledge questionnaire after the administration of self-instruction module on 14 day, 15 day, 16 day, 17 day

RESEARCH SETTING-

Sample	Phase I	Phase II				Phase III
	Preparation of structured knowledge questionnaire on central venous pressure monitored by CVP manometer	Pre-test (O1) Day1,day2, day3,day4	Preparation of self-instruction Module	Administration of self-instruction module on (X)Day7	Post-test (O2) Day14, day15, day 16, day17	Data analysis.
MICU staff Nurses Working in Selected hospital, Jaipur.	Review of literature. Discussion with expert. Preparation of Blueprint Blueprint Preparation of the tool Content validity. Pre-testing. Reliability of the tool. Pilot study.	Assess the level of knowledge score on central venous pressure monitor by CVP manometer among MICU Staff nurses working in selected hospital	Preparation of self-instruction module based on pre-test Score	Administration of the self-instruction module	Assess the post-test Knowledge score of MICU staff nurses Regarding Central venous pressure monitored by CVP manometer Using the same tool	Data will be analyzed using Descriptive and inferential statistics and the data will be presented in the form of tables, graphs and diagrams. The Hypothesis will be tested at 0.05 level of significance

POPULATION-

- The term population refers to the aggregate or totality of all the objects, subjects or members that confirm to a set of specifications.
- In the present study the population comprised of MICU staff nurses working in a selected hospital, Jaipur..

SAMPLE-

- Sample refers to the subset of a population selected to participate in a research study.
- In the present study, the samples were 60 MICU staff nurses working at MANIPAL hospital and MARUDHAR hospital Jaipur during the time of data collection.

SAMPLE SIZE-

In this study the sample size was 60 MICU staff nurses working in MANIPAL hospital and MARUDHAR hospital Jaipur.

CRITERIA FOR SAMPLE SELECTION

Inclusion criteria

MICU staff nurses who are:

- having diploma or bachelor in nursing and midwifery.
- willing to participate in the study
- available during the time of data collection.
- of both gender.

Exclusion criteria

MICU staff nurses who are:

- not able to co-operate throughout the period of the study.

- on leave at the time of data collection.

RESULTS-

Analysis and interpretation of data is the most important phase of the research process, which involves organizing and synthesizing the data so as to answer research questions and test hypothesis. This phase includes completion, editing, coding, classification, and presentation of data.

The complex data is broken into smaller parts to gain better understanding of content. The purpose of analyzing data collected in a study is to describe the data in meaningful terms, as the data collected doses not answer research questions or test research hypothesis. This process is also defined as the systemic application of statistical and logical techniques to describe, summarize and compare data.

ORGANIZATION OF FINDINGS

The organization involves gathering together all the collected data in a manner that a process of analysis can be initiated. The collected information was organized and presented in four parts.

- **PART I:** Description of the demographic variables of the MICU staff nurses.
- **PART II:** Analysis of pre-test and post-test knowledge scores of MICU staff nurses regarding central venous pressure monitoring by CVP manometer.
- **PART III:** Evaluation of effectiveness of the self-instructional module on central venous pressure monitoring by CVP manometer

Section A: Quartile distribution of the pre-test and the post-test knowledge scores of MICU staff nurses regarding central venous pressure monitoring by CVP manometer.

Section B:

1. Comparison of pre-test and post-test knowledge scores of MICU nurses central venous pressure monitoring by CVP manometer
2. Area wise effectiveness of self-instructional module central venous pressure monitoring by CVP manometer
3. Testing of hypothesis, H1.

- **PART IV:** Association of the pre-test knowledge scores with the selected demographic variables.

Section A: Overall association of pre-test knowledge scores with the selected demographic variables.

Section B: Testing of Hypothesis, H2.

PART 1: DESCRIPTION OF THE DEMOGRAPHIC VARIABLES OF THE MICU STAFF NURSES

Table 1: Frequency and percentage distribution of demographic variables of MICU staff nurses

Demographic information		No. of parents	% of respondents
Age	21-25years	18	30.00%
	26-30years	19	31.67%
	31-35years	14	23.33%
	35-40years	9	15.00%
Sex	Male	33	55.00%
	Female	27	45.00%
Education	GNM	27	45.00%
	BSc Nursing	13	21.67%
	P.BSc Nursing	17	28.33%
	MSc nursing	3	5.00%
Experience of staff	1-2years	7	11.67%
	3-4years	12	20.00%
	5-6years	19	31.66%
	> 6years	22	36.67%
Previous knowledge Regarding CVP	Yes	13	21.67%
	No	47	78.33%
Source of information	Mass media	10	16.67%
	Newspaper	15	25%
	Books	27	45%
	Others	8	8%

Table1: shows the demographic information of staff nurses those who are participated for the following study "A study to evaluate the effectiveness of self-instruction module on knowledge regarding of central venous pressure monitoring by CVP manometer among staff nurses who have working in MICU in selected hospital, Jaipur."

Table 1.1 AGE WISE CLASSIFICATION OF RESPONDENTS

S. No	VARIABLE		FREQUENCY	PERCENTAGE
1.	AGE	21-25years	18	30.00%
		26-30years	19	31.67%
		26-30years	14	23.33%
		35-40years	9	15.00%

Table 1.1: The above table 1.1 and figure 2 shows the classification of respondents according to age, out of 60 staffs, 30.00% (18) of the subjects belongs to the age group of 21-25 years and 31.67% (19) in the age group of 26-30 years and 23.33% (14) of them are in age group 31-35years and 15.00% (9) in the age of above 35-40years.

Table 1.2 GENDER WISE CLASSIFICATIONS OF RESPONDENTS

S. No.	VARIABLE		FREQUENCY	PERCENTAGE
2.	Gender	Male	33	55.00%
		Female	27	45.00%

Table 1.2: The above table 1.2 and figure 3 shows the classification of respondents according to gender, out of 60 staffs, 55.00% (33) of the staffs belongs to the gender group of Male and 45.00% (27) in the gender group of Female.

Table 1.3 EDUCATION WISE CLASSIFICATIONS OF RESPONDENTS

S.NO.	VARIABLE		FREQUENCY	PERCENTAGE
3.	Education	GNM	27	45.00%
		B.Sc.(N)	13	21.67%
		Post Basic B.Sc.(N)	17	28.33%
		M.Sc.(N)	3	5.00%

Table 1.3: The above table1.3 and figure 4 shows the classification of respondents according to education, out of 60 staff, 45.00% (27) of subjects doing GNM, 21.67% (13) of them B.Sc. Nursing, 28.33%(17) Post Basic B.Sc. Nursing and 5.00% (3) of them are M. Sc. Nursing.

Table 1.4 Work Experience wise classifications of respondents

S. NO.	VARIABLE		FREQUENCY	PERCENTAGE
4	Work Experience	1-2years	7	11.67%
		3-4 years	12	20.00%
		5-6 years	19	31.66%
		6 years above	22	36.67%

Table 1.4: The above table 1.4 and figure 5 shows the classification of respondents according to Work Experience group, out of 60 staff, 11.67% (7) of the subjects belongs to the work experience group of 1-2 years and 20.00% (12) in the age group of 3-4 years and 31.66% (19) of them are in work experience group 5-6 years and 36.67% (22) in the work experience above 6 years.

Table 1.5 PREVIOUS KNOWLEDGE REGARDING CVP WISE CLASSIFICATION OF RESPONDENTS

S. NO.	VARIABLE		FREQUENCY	PERCENTAGE
5.	Previous knowledge regarding CVP	Yes	13	21.67%
		No	47	78.33%

Table 1.5: The above table 1.5 and figure 6 shows the classification of respondents according to knowledge about central venous pressure is that 78.33% (47) does not have idea about CVP and 21.67% (13) has the knowledge about CVP.

Table 1.6 SOURCE OF INFORMATION ABOUT CVP WISE CLASSIFICATION OF RESPONDENTS

S. NO.	VARIABLE		FREQUENCY	PERCENTAGE
6	SOURCE OF INFORMATION	Mass media	10	16.67%
		Newspaper	15	25%
		Books	27	45%
		Others	8	12.9%

Table 1.6: The above table 1.6 and figure 7 shows the classification of respondents according to source of information, out of 60 subjects 16.67% (10) of the subjects belongs to mass media, 25% (15) belongs to newspaper,45%(27) belongs to books, and 12.9% (8) belongs to others source of information.

PART-2 ANALYSIS OF PRE-TEST AND POST- TEST KNOWLEDGE REGARDING CENTRAL VENOUS PRESSURE MONITORING BY CVP MANOMETER

Table 2: PRETEST LEVEL OF KNOWLEDGE

Level of knowledge	No. of staff nurses	%
Inadequate knowledge	35	58.3%
Moderate knowledge	19	31.7%
Adequate knowledge	6	10.0%
Total	60	100%

Table No. 2: The above table 2 and figure 8 shows the staff nurses level of knowledge on central venous pressure monitoring by CVP manometer. In general 58.3% of staff nurses are having inadequate, knowledge and 31.7% of them having moderate knowledge and 10.0% of them are having adequate knowledge

Knowledge Score Interpretation:

Min=0 Max=1 Total questions=30 Maximum marks= 30.

S. no.	Grade	Percentage	Marks
1.	Inadequate knowledge	0–50%	<15
2.	Moderate knowledge	50–75%	16-22
3.	Adequate knowledge	76–100%	23-30

Table 3: OVERALL PRETEST KNOWLEDGE SCORE

	No. of questions	Min–Max score	Knowledge score	
			Mean ±SD score	%
Overall score	30	0-30	13.73±4.42	45.76%

Table no. 3: Shows, pre-test percentage of knowledge on central venous pressure monitoring by CVP manometer. Overall pre-test percentage of knowledge score is 45.76% among staff nurses who have working in MICU in selected hospital, Jaipur.

PART-3: EVALUATION OF EFFECTIVENESS OF INFORMATION BOOKLET ON KNOWLEDGE REGARDING CENTRAL VENOUS PRESSURE MONITORING BY CVP MANOMETER.

Table 4: POSTTEST LEVEL OF KNOWLEDGE

Level of knowledge	No. of parents	%
Inadequate knowledge	6	10.0%
Moderate knowledge	12	20.0%
Adequate knowledge	42	70.0%
Total	60	100%

Table No.4: The above table 4 and figure 9 shows the parents level of knowledge on regarding central venous pressure monitoring by CVP manometer. In general 10.0% of the parents are having inadequate level of knowledge score, 20.0% of them having moderate level of knowledge score and 70.0% of them are having adequate level of knowledge score.

Table 5: OVERALL POST-TEST KNOWLEDGE SCORE

	No. of questions	Min–Max score	Knowledge score	
			Mean ±SD score	%
Overall score	30	0-30	22.98±3.87	76.60%

Table no. 5: Shows, post-test percentage of knowledge score regarding central venous pressure monitoring by CVP manometer. Overall post-test percentage of knowledge score is 76.60% among staff nurses.

Table 6: COMPARISON OF OVERALL KNOWLEDGE SCORE BEFORE AND AFTER SELF-INSTRUCTION MODULE

	No. o f parent	Pretest Mean ±SD	Posttest Mean ±SD	Mean difference Mean ±SD	Student's paired t-test
Overall Knowledge Score	60	13.73±4.42	22.98±3.87	9.25±0.55	t=12.45P=0.001*** DF=59,significant

Table no 6 shows the comparison of overall knowledge before and after the administration of SIM.

On an average, parents are improved their knowledge from 13.73 to 22.98 after the administration of structured teaching programme. Or we can say, in pre-test they are able to answer only 10 questions before administration of SIM, after administration of SIM they are able to answer up to 25 questions. Due to SIM they are able to answer 10 more questions correctly. This difference is statistically significant. Statistical significance was calculated by using student's paired 't' test.

Table 7: COMPARISON OF PRETEST AND POSTTEST LEVEL OF KNOWLEDGE SCORE

Level of knowledge	Pre-test		Post-test		Generalized Mc Nemar's test
	n	%	N	%	
Inadequate knowledge	35	58.3%	6	10.0%	$\chi 2$=46.33 P=0.001***(S)
Moderate knowledge	19	31.7%	12	20.0%	
Adequate knowledge	6	10.0%	42	70.0%	
Total	60	100.0%	60	100.0%	

Table no.7: The above table 7 and figure-10 shows the pre-test and post-test level of knowledge among staff nurses Before SIM, 58.3% of the staff nurses are having inadequate level of knowledge score, 31.7% of them having moderate level of knowledge score and 10.0% of them are having adequate level of knowledge score.

After SIM, 10.0% of the staff nurses are having inadequate level of knowledge score, 20.0% of them having moderate level of knowledge score and 70.0% of them are having adequate level of knowledge score.

Level of knowledge gain of between pre-test and post-test was calculated using Generalised Mc Nemar's chi-square test.

TABLE 8: EFFECTIVENESS AND GENERALIZATION OF STRUCTURED TEACHING PROGRAMME

	Max score	Mean score	Mean Difference of knowledge gain score with 95% Confidence interval	Percentage Difference of knowledge gain score with 95% Confidence interval
Pre-test	30	13.73	9.25(7.76–10.73)	30.83%(25.86%–35.76%)
Post-test	30	22.98		

Table no. 8: shows the effectiveness of self-instruction module regarding of central venous pressure monitoring by CVP manometer among staff nurses who have working in MICU in selected hospital, Jaipur. On an average, in post-test after having SIM, staff nurses are gained 30.83% more knowledge score than pre-test score.

PART-4: ASSOCIATION BETWEEN PRETEST LEVEL OF KNOWLEDGE AND THEIR DEMOGRAPHIC VARIABLES

TABLE 9: ASSOCIATION BETWEEN PRETEST LEVEL OF KNOWLEDGE AND THEIR DEMOGRAPHIC VARIABLES

Demographic variables		Pre test level of knowledge score						N	Chi square test
		Inadequate		Moderate		Adequate			
		n	%	N	%	n	%		
Age	21-25years	15	83.33%	3	16.67%	0	0.00%	18	**χ2=13.29 P=0.04* (S)**
	26-30years	12	63.15%	7	36.84%	0	0.00%	19	
	31-35years	6	42.85%	5	35.71%	3	21.42%	14	
	35-40years	2	22.22%	4	44.44%	3	33.34%	9	
Sex	Male	18	54.55%	12	36.36%	3	9.09%	33	χ2=0.75 P=0.68 (NS)
	Female	17	62.96%	7	25.93%	3	11.11%	27	
Education	GNM	14	51.85%	11	40.74%	2	7.41%	27	χ2=6.90 P=0.33 (NS)
	BSc Nursing	10	76.92%	1	7.69%	2	15.38%	13	
	P.BSc Nursing	10	58.82%	6	35.29%	1	5.88%	17	
	MSc nursing	1	33.33%	1	33.33%	1	33.33%	3	
Experience Of staff	1-2years	6	85.71%	1	14.29%	0	0.00%	7	**χ2=12.71 P=0.05* (S)**
	3-4years	10	83.33%	2	16.67%	0	0.00%	12	
	5-6years	11	57.89%	4	21.05%	2	10.52%	19	
	> 6years	6	27.27%	12	54.54%	4	18.18%	22	
Previous knowledge regarding CVP	Yes	6	46.15%	3	23.08%	4	30.77%	13	**χ2=7.96 P=0.02* (S)**
	No	29	61.71%	16	34.04%	2	4.25%	47	
Source of information	Mass media	4	50.00%	2	25.00%	2	25.00%	8	χ2=4.25 P=0.64 (NS)
	Newspaper	8	72.73%	3	27.27%	0	0.00%	11	
	Books	10	52.63%	7	36.84%	2	10.53%	19	
	Others	4	44.44%	4	44.44%	1	11.11%	9	

Table no 9: Shows the association between pre-test level of knowledge and their demographic variables. Youngers, more years of experience and previous source of knowledge staff nurses are having more knowledge than others. Statistical significance was calculated using Pearson chi square test.

Table 9.1: ASSOCIATION BETWEEN PRETEST LEVEL OF KNOWLEDGE AND THEIR DEMOGRAPHIC VARIABLES

Demographic variables		Pre-test level of knowledge score						n	Chi square test
		Inadequate		Moderate		Adequate			
		N	%	n	%	N	%		
Age	21-25years	15	83.33%	3	16.67%	0	0.00%	18	**χ2=13.29 P=0.04* (S)**
	26-30years	12	63.15%	7	36.84%	0	0.00%	19	
	31-35years	6	42.85%	5	35.71%	3	21.42%	14	
	35-40years	2	22.22%	4	44.44%	3	33.34%	9	

Table 9.1: The above table 9.1 and figure 12 shows the association between pre-test level of knowledge score and age group.

The above table 9.1 show the chi-square test values was found to be c2= 8.76 hence, it is found to be significant.

Table 9.2: ASSOCIATION BETWEEN PRETEST LEVEL OF KNOWLEDGE AND THEIR DEMOGRAPHIC VARIABLES

Demographic variables		Pre-test level of knowledge score						N	Chi square test
		Inadequate		Moderate		Adequate			
		N	%	n	%	N	%		
Experience of staff	1-2years	6	85.71%	1	14.29%	0	0.00%	7	**χ2=12.71 P=0.05*(S)**
	3-4years	10	83.33%	2	16.67%	0	0.00%	12	
	5-6years	11	57.89%	4	21.05%	2	10.52%	19	
	> 6years	6	27.27%	12	54.54%	4	18.18%	22	

Table 9.2: The above table 9.2 and figure 13 shows the association between pre-test level of knowledge score and years of experience.

The above tables 9.2 show the chi-square test a value was found to be c2=12.71 hence, it is found to be significant.

TABLE 9.3: ASSOCIATION BETWEEN PRETEST LEVEL OF KNOWLEDGE AND THEIR DEMOGRAPHIC VARIABLES

Demographic variables		Pre-test level of knowledge score						N	Chi square test
		Inadequate		Moderate		Adequate			
		N	%	N	%	n	%		
Previous knowledge regarding CVP	Yes	6	46.15%	3	23.08%	4	30.77%	13	**χ2=7.96**
	No	29	61.71%	16	34.04%	2	4.25%	47	**P=0.02* (S)**

Table 9.3: The above table 9.3 and figure 14 shows the association between pre-test level of knowledge score and previous knowledge on CVP.

The above tables 9.3 show the chi-square test a value was found to be c2=7.96 hence, it is found to be significant.

Table 10: ASSOCIATION BETWEEN POSTTEST LEVEL OF KNOWLEDGE AND THEIR DEMOGRAPHIC VARIABLES

Demographic variables		Post test level of knowledge score						N	Chi square test
		Inadequate		Moderate		Adequate			
		n	%	N	%	n	%		
Age	21-25years	3	16.67%	3	16.67%	12	66.67%	18	χ2=6.77 P=0.34 (NS)
	26-30years	0	0.00%	3	15.79%	16	84.21%	19	
	31-35years	2	14.29%	5	35.71%	7	50.00%	14	
	35-40years	1	11.11%	1	11.11%	7	77.78%	9	
Sex	Male	5	15.15%	7	21.21%	21	63.64%	33	χ2=2.42P= 0.30(NS)
	Female	1	3.70%	5	18.52%	21	77.78%	27	
Education	GNM	6	22.22%	7	25.93%	14	51.85%	27	χ2=11.67 P=0.07 (NS)
	BSc Nursing	0	0.00%	1	7.69%	12	92.31%	13	
	P.BSc Nursing	0	0.00%	3	17.65%	14	82.35%	17	
	MSc nursing	0	0.00%	1	33.33%	2	66.67%	3	
Experience Of staff	1-2years	1	14.29%	2	28.57%	4	57.14%	7	χ2=4.62 P=0.59 (NS)
	3-4years	2	16.67%	2	16.67%	8	66.67%	12	
	5-6years	3	15.79%	4	21.05%	12	63.16%	19	
	> 6years	0	0.00%	4	18.18%	18	81.82%	22	
Previous knowledge regarding CVP	Yes	0	0.00%	3	23.08%	10	76.92%	13	χ2=1.85 P=0.39(NS)
	No	6	12.77%	9	19.15%	32	68.09%	47	
Source of information	Mass media	1	12.50%	0	0.00%	7	87.50%	8	χ2=6.83 P=0.33 (NS)
	Newspaper	0	0.00%	3	27.27%	8	72.73%	11	
	Books	3	15.79%	4	21.05%	12	63.16%	19	
	Others	2	22.22%	0	0.00%	7	77.78%	9	

Table no. 10: Shows the association between post-test level of knowledge and their demographic variables. None of the variables are significant. Statistical significance was calculated using Pearson chi square test.

Table 11: ASSOCIATION BETWEEN KNOWLEDGE GAIN SCORE AND DEMOGRAPHIC VARIABLES

Demographic variables		Knowledge gain score						n	One way ANOVAF-test/t-test
		Pretest		posttest		Gain score = Post-Pre			
		Mean	SD	Mean	SD	Mean	SD		
Age	21-25years	13.22	3.89	18.22	4.29	5.00	6.39	18	**F=3.62 P=0 05*(S)**
	26-30years	14.53	4.68	23.00	2.71	8.47	5.10	19	
	31-35years	14.29	4.43	24.50	4.42	10.21	5.86	14	
	35-40years	13.33	5.45	26.11	4.37	12.78	6.08	9	
Sex	Male	14.15	3.93	22.27	3.93	8.12	5.34	33	t=1.70 P=0.09(NS)
	Female	13.22	5.00	23.85	3.69	10.63	6.03	27	
Education	GNM	14.33	3.54	21.37	4.30	7.04	5.36	27	F=2.54 P=0.10(NS)
	BSc Nursing	12.23	5.88	22.92	3.07	10.69	6.30	13	
	P.BSc Nursing	13.35	4.20	23.82	2.65	10.47	4.87	17	
	MSc nursing	17.00	5.57	26.33	4.62	9.33	3.51	3	
Experience Of staff	1-2years	16.86	5.43	22.86	4.56	6.00	5.89	7	**F=2.76 P=0.05*(S)**
	3-4years	13.25	4.16	20.75	4.75	7.50	7.08	12	
	5-6years	13.05	3.72	23.41	4.40	10.36	5.63	19	
	> 6years	13.59	4.69	26.23	2.60	12.64	5.03	22	
Previous knowledge regarding CVP	Yes	14.37	5.66	25.33	3.91	10.96	6.21	13	**t=2.24 P=0.05*(S)**
	No	13.10	2.66	20.77	3.76	7.67	5.36	37	
Source of information	Mass media	15.00	6.23	23.75	4.20	8.75	7.17	8	F=0.18 P=0. 90(NS)
	Newspaper	13.00	3.16	23.18	2.64	10.18	4.12	11	
	Books	14.26	4.17	22.74	4.19	8.47	5.87	19	
	Others	13.56	5.17	22.67	4.85	9.11	7.62	9	

Table no. 11: shows the association between level of knowledge gain score and their demographic variables.

DISCUSSION-

Data was collected from 60 MICU staff nurses selected by convenience sampling before administering self-instruction module data were collected using structured knowledge questionnaire. Then MICU staff nurses were asked to complete same questionnaire one week after the educational intervention. The collected data was tabulated, analyzed and interpreted by using descriptive and inferential statistics. The findings of the study have been discussed with reference to the objectives and hypotheses stated.

The data findings have been organized and finalized according to the plan for data analysis and are presented under the following sections.

- Part I: Description of the demographic variables of the MICU staff nurses.
- Part II: Analysis of pre-test and post-test knowledge scores of MICU staff nurses regarding central venous pressure monitoring by CVP manometer.
- Part III: Evaluation of effectiveness of the self-instructional module on central venous pressure monitoring by CVP manometer
- Part IV: Association of the pre-test knowledge scores with the selected demographic variables.

PART I: DESCRIPTION OF THE DEMOGRAPHIC VARIABLES OF THE MICU STAFF NURSES

The percentage distribution of subjects shows that majority 19(31.67%) of the MICU staff nurses were in the age group of 26-30 years, maximum number of subjects were male 33 (55.00%), maximum number 27 (45%) participated in the study were G.N.M. nurses, most of staff nurses 22 (36.67%) had more than 6 years of experience, staff nurses 47 (78.33%) were not having any previous exposure to in-service educational programme regarding CVP, and books (27) 45%) source of information.

In a self-instruction module study which the findings of the study demonstrated that among 364 staff nurses surveyed, A total of 364 nurses participated in the study, including 302 female nurses and 62 male nurses. The average age was 46.22 years and the male to female ratio was 1:4.8. In comparison with nurses working in MICU were more experienced having 6 or more years of experience (40.42% p<0.001), had more than 8 hours duty per day (38.70% p <0.001) and more hours of standing in working (57.14%, p <0.001.

Part II: ANALYSIS OF PRE-TEST AND POST-TEST KNOWLEDGE SCORES OF MICU STAFF NURSES REGARDING CENTRAL

VENOUS PRESSURE MONITORING BY CVP MANOMETER.

Assessment of the level of pretest knowledge score among MICU staff nurses depicts that, majority 35 (58.3%) of respondents had inadequate knowledge scores, moderate knowledge19 (31.7%) and 6 (10.0%) respondents had adequate knowledge. The finding of the study has revealed that there is an urgent need to educate the MICU staff nurses regarding central venous pressure monitoring by CVP manometer.

The above study findings were supported by a descriptive study to assess the knowledge central venous pressure monitoring by CVP manometer staff nurses with 60 nurses sample who care for patients with central venous pressure, Many of the subjects (58.0%) were having in adequate knowledge regarding central venous pressure, followed by 31.7% having average knowledge, and 10% were having very good knowledge. The mean percentage of overall level of knowledge was 59.64%.

Part III: EVALUATION OF EFFECTIVENESS OF THE SELF- INSTRUCTIONAL MODULE ON CENTRAL VENOUS PRESSURE MONITORING BY CVP MANOMETER

The knowledge scores of nurses regarding central venous pressure monitoring by CVP manometer has revealed that, post-test mean knowledge score was found higher 22.98 (76.60%) and SD of 3.87 when compared with pre-test mean knowledge score which was 13.73 (45.76%with SD of 4.42. The mean effectiveness score was 9.25 with SD of 0.55. The results of the study depicts that the self-instruction module was very effective in improving the knowledge of the MICU staff nurses regarding central venous pressure monitoring by CVP manometer.

Part IV: TESTING OF HYPOTHESES

Testing of hypothesis, H1

The hypothesis was tested using paired 't' test. The 't' value was calculated and compared with table value to analyze the difference in knowledge of MICU staff nurses regarding central venous pressure monitoring by CVP manometer. The result revealed that the mean post-test knowledge score (76.60%) was higher than the mean pre-test knowledge score (45.76%) with a mean difference of (30.83%) The calculated 't' value 12.45 was greater than the table value 1.664 at 0.05 level of significance.

Testing of hypothesis,H2

In a similar study which intended to identify if differences in knowledge of the staff nurses regarding lifestyle modifications of CVP due to nurses' education, work experiences, or home health care nurses' educational needs. The study found that there was a great deal of variation regarding depth of knowledge among the nurses. Level of education made no significant statistical difference.

NURSING IMPLICATION-

- Professional nursing practice is a commitment to compassion, caring and strong ethical values; continuous development of self and others; accountability and responsibility for insightful practice; demonstrating a spirit of collaboration and flexibility.
- Nurses working in surgical department must possess specialized skills and has to perform care these patients. It challenge the nurse's skills to be up-to-date with knowledge and competence.
- Staff development programmes through continuous education and training, teaching and learning materials like self-instruction module are major factors in shaping the future of the nursing profession.
- The findings of the study have several implications in the field of nursing practice, nursing education, nursing administration and nursing research.

Nursing administration-

- In order to support the patients' transition after central venous pressure and to help them have trust, adaptability and empowerment there is a need for team-based clinics with a structured follow-up programme.
- The MICU staff nurses could provide time to verbalize and allow discussions of holistic care face to face or in support groups.
- Educational information material consisting of brochures, videos, websites and other computer-based tools including a holistic perspective needs to be further developed.
- As the number of hospitals caring for central venous pressure diseases increases, there is a need for an organized forum for the MICU staff nurses aiming to discuss best clinical practice, educational strategies and support programmes to ensure that the patients receive equal care regardless of where they live and have their treatment and follow-up.
- Finally, different multidisciplinary interventions should be highlighted in the clinical guidelines for the healthy lifestyles.
- The findings of the study have shown that there is improvement in nurse's knowledge regarding central venous pressure monitoring by CVP manometer**.**

Nursing research-

- Nursing practice needs to be based on scientific inquiry to build up nursing profession. One of the aims of nursing research is to expand and broaden the scope of nursing. There is a need for evaluation of intervention programmes that include a holistic perspective of educational information.
- Although much research has been done on the central venous pressure knowledge in nursing, the effectiveness of self-instruction module on regarding central venous pressure monitoring by CVP manometer is least explored area. There is lot of scope for exploring this area.
- The use of the research findings should become part of the quality assurance evaluation to enhance the nursing profession as a whole.

The findings of the present study can be utilized by nurse researchers to contribute to the nursing profession to accumulate new knowledge regarding central venous pressure monitoring by CVP manometer.

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