

Full Length Research Paper

A study of pre and post test knowledge score of nurses on care of patient with central venous access devices in selected oncology hospital of Bangalore

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Central venous access devices are small, flexible tubes placed in large veins for people who require frequent access to the bloodstream. Educational programs that advance knowledge, skill and competence and determine performance levels for nurses caring for patients with central venous access devices will be effective. Development of criteria rating scale, preparation of Structural Teaching Programme (STP) and content validity were the steps followed to develop STP. The present study was conducted at the New Building of Bangalore Institute of Oncology. Staff nurses had the highest mean percentage (70%) in complications and its management concept, and lowest (66%) in the area of concept with standard deviation of 1.1 and 1.5 respectively. The overall pre-test knowledge mean percentage was 67%. Staff nurses had the highest mean percentage (91%) in the complications and its management, and lowest (85%) in the area of concept with standard deviation of 1.2 and 1.6 respectively. The overall post test knowledge mean percentage was 87%. Overall, mean percent of pre test knowledge score was 67% and post test knowledge score was 87%. The data further supports that post test knowledge scores were greater than the pre test knowledge scores. So, there was 20% enhancement in the overall knowledge after the structured teaching program. The statistical paired 't' test for overall knowledge was found as 8.5 (p-value = 0.0001) which emphasizes that the difference in pre test and post test knowledge score was found to be statistically significant at 0.0001 level. This implies that the teaching programme on care of patient with central venous access device among staff nurses is effective.

Key words: Nurse, central venous access devices, structural teaching programme.

INTRODUCTION

Patient care is part of a nurse's role. Nursing care is increasingly framed in best practice, which is the application of evidence-based concepts to patient problems in a particular setting. Nurses provide ongoing assessment of people's health. Their round-the-clock presence, observation skills, and vigilance allow doctors

to make better diagnosis and propose better treatments. Many lives have been saved because an attentive nurse picked upon early warning signs of upcoming crisis. Venous access devices that can be implanted under the skin were introduced in 1982. Central venous access devices are small, flexible tubes placed in large veins for people who require frequent access to the bloodstream. It is often referred to as venous access ports or catheters, because they allow frequent access to the veins without deep needle sticks. Venous access devices typically remain in place for long periods, weeks, months, or even

longer. The main advantages of using these devices are that it allows large volumes of fluids, and medications can be administered quickly and safely (Menamin, 1993). Central venous catheterization are mainly used to monitor central venous pressure, administer large amounts of intravenous fluids such as colloids, blood products, hyper-osmolar drugs and fluids, for example Noradrenalin/Adrenaline, Parenteral Nutrition and chemotherapy to provide long term access to frequent or prolonged uses of chemotherapy, antibiotics, blood sampling, haemodialysis (Heard, 2001; Baranowski, 1993).

In India, the use of central venous catheter (CVC) is routine in critically ill patients, in fact 78% of the patients had some form of central venous catheter. Central venous catheterization may cause different complications including infection, haemorrhage and thrombosis. Catheter related bacteraemia is a major and common clinical problem particularly in critically ill patients. Catheter related bacteraemia rates up to 43% (Schulmeister, 1998). Nurses are responsible for teaching patients about device care and how to troubleshoot complications. Nurses must be aware of factors that can affect learning, such as the patient's age, physical and emotional status, educational level, and current stress level. Failure to provide proper instruction may resort in the omission of vital steps, which may create problems with any type of device. Educational programs that advance knowledge, skill and competence and determine performance levels for nurses caring for patients with central venous access devices will be effective. Specific policies and procedures, based on the current evidence can be implemented and these can evaluate and review the process (Talbot, 1995).

Approximately, 3.4 million central venous access catheters are placed in patients, in each year. Every year, almost 6,000 patients acquire a catheter-related bloodstream infection. Catheter malfunction has an incidence of 10-20%. Catheter fracture is rare (<1%). A total of 41% of central venous catheters (CVC) result in thrombosis of the blood vessel. The major thrombotic complication of CVCs is deep venous thrombosis. These mural thrombi may partially or completely block the blood vessel and involve 12 – 74% of all CVCs (Abedin, 2008).

Central line placement in the emergency department is a common practice. The studies have quoted mechanical complication rates in emergency medicine patients of 10-15%. A study was conducted over 6 months to determine the rate of infection associated with short-term central venous catheters. The investigators examined 448 catheters in 209 patients. Out of 309 catheters in 158 patients, a total of 5 clinical line infections were found. The infection rates were 1.6% for catheters, 2.8 infections per 1000 catheter days, and 3.2% per patient. The clinical line infection rates found in this study compare favourably with other rates reported (Fardo, 2005).

The use of central venous catheters for vascular

access is now common place in a variety of care settings. The nurse must be able to recognize the indications, advantages and disadvantages associated with each device, and to assist the patient in making an informed decision regarding the appropriate device for his or her therapy needs. It is essential that care and maintenance procedures be delivered by those whose knowledge base and experience make them competent care providers with the expertise to initiate appropriate prevention and troubleshooting measures, as well as to evaluate and implement nursing actions related to complications (Drewett, 2000).

As central venous catheters become more widely used in today's healthcare environment, nurses require expert knowledge in relation to central venous catheter maintenance to prevent complications and maximize efforts to optimize the individual's health status. Central venous catheters have begun to be used outside Intensive Care Units (for example, in general wards), and can be associated with high incidences of infection, occlusion and subsequent compromise in patient health. Nurses are responsible for the maintenance of central venous catheter resulting in a need for literature specific to the nursing aspects of management (Gilleece, 1997).

In all India Institute of Medical Sciences, New Delhi, over a 24 month period in a cardiac surgical intensive care unit was used to determine the incidence of infection associated with multi-lumen venous catheters. The influence of various factors including fever, peripheral blood culture, catheter site, catheter usage for monitoring central venous pressure and/ino-trope therapy on infection rates were statistically evaluated. Bacteraemia occurred in 3% of catheter insertions and catheter colonisation developed in 24%. The data indicate that the inability to identify —risk factorsll for catheter infection emphasise the need to maintain a high index of suspicion (Jansen, 1994).

According to a study which was conducted in Paediatric Haematology and Oncology, Rajiv Gandhi Cancer Institute and Research Centre, Delhi, peripherally inserted central venous catheters are a good option for prolonged venous access. The common reasons for catheter removal were suspected infection, breakage/leakage, dislodgement, phlebitis, and occlusion with rates of 1.27, 0.57, 0.31, 0.06, and 0.06 per 1,000 catheter days, respectively. The study concluded that peripherally inserted central venous catheters are convenient, cheap, safe, and reliable device for long term intravenous access in patients with malignancies. This was possible with the help of dedicated catheter care nurses (Thomas-Hawkins, 1996).

Registered nurses require specific education and training to attain the knowledge, assessment skills and technical expertise required to manage the care for patients who have central venous access devices and the device-related complications that patients may experience. The nursing role includes: educating the

MATERIALS AND METHODS

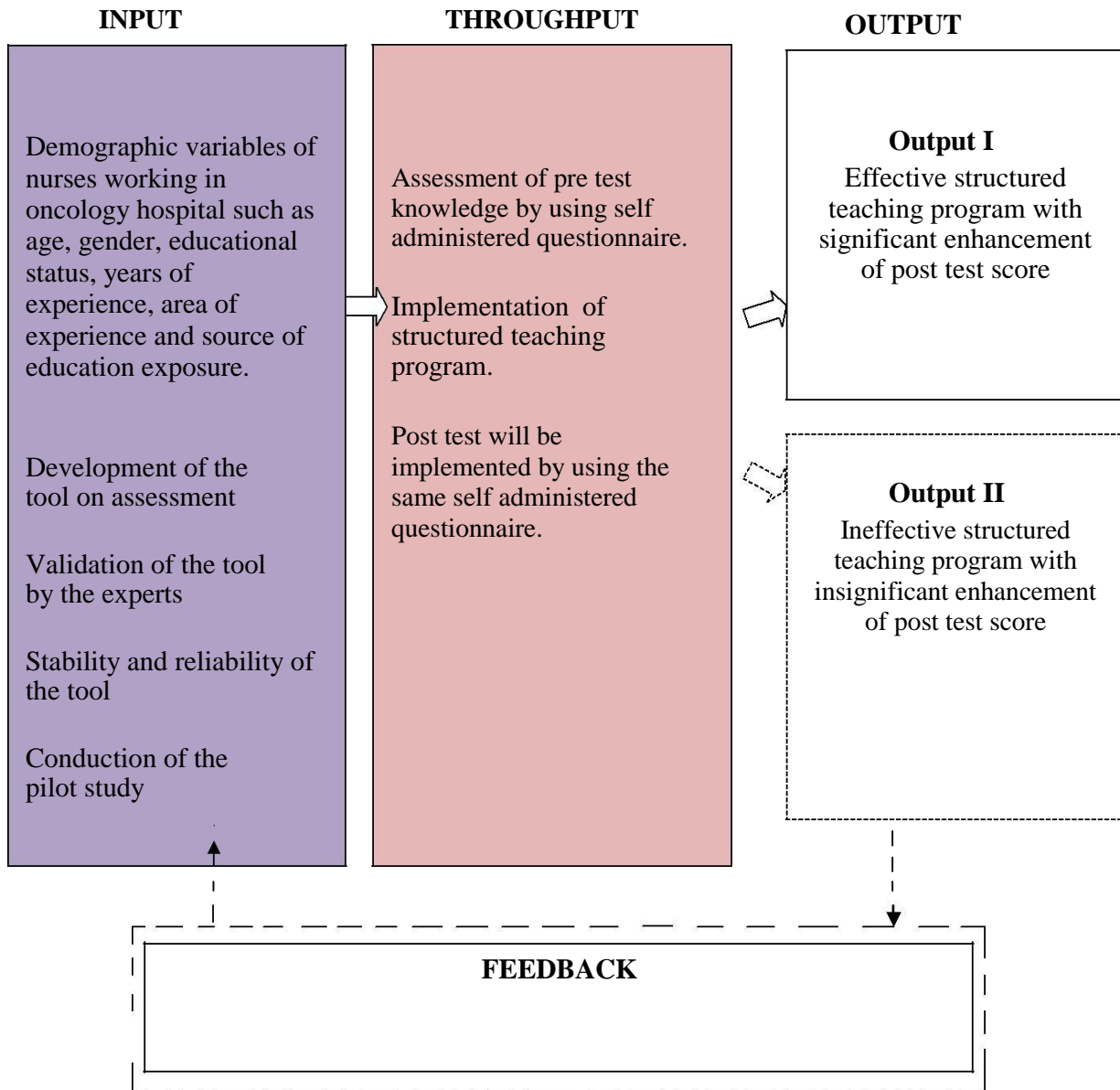


Fig-1: Conceptual frame work based on General Systems Theory

Figure 1. Conceptual frame work based on General Systems Theory. - Not included in the study; → - Not included in the study.

patient and the family about the device and its care, providing ongoing central venous access devices management, including the management of complications and the ability to advocate for the patient when necessary. The research study and working area created insight in the investigators' mind and they felt the need to design a study to conduct structured teaching programme for nurses who are working in oncology hospital where the staff nurses have to take care of patient with central venous access devices for the chemotherapy. This helped in improving the knowledge of nurses regarding care of patient with central venous

access devices.

MATERIALS AND METHODS

The conceptual frame work of this study based on General Systems Theory is depicted in Figure 1, while a schematic representation of the research design is given in Figure 2.

Population

Population is a well defined set that has certain specified

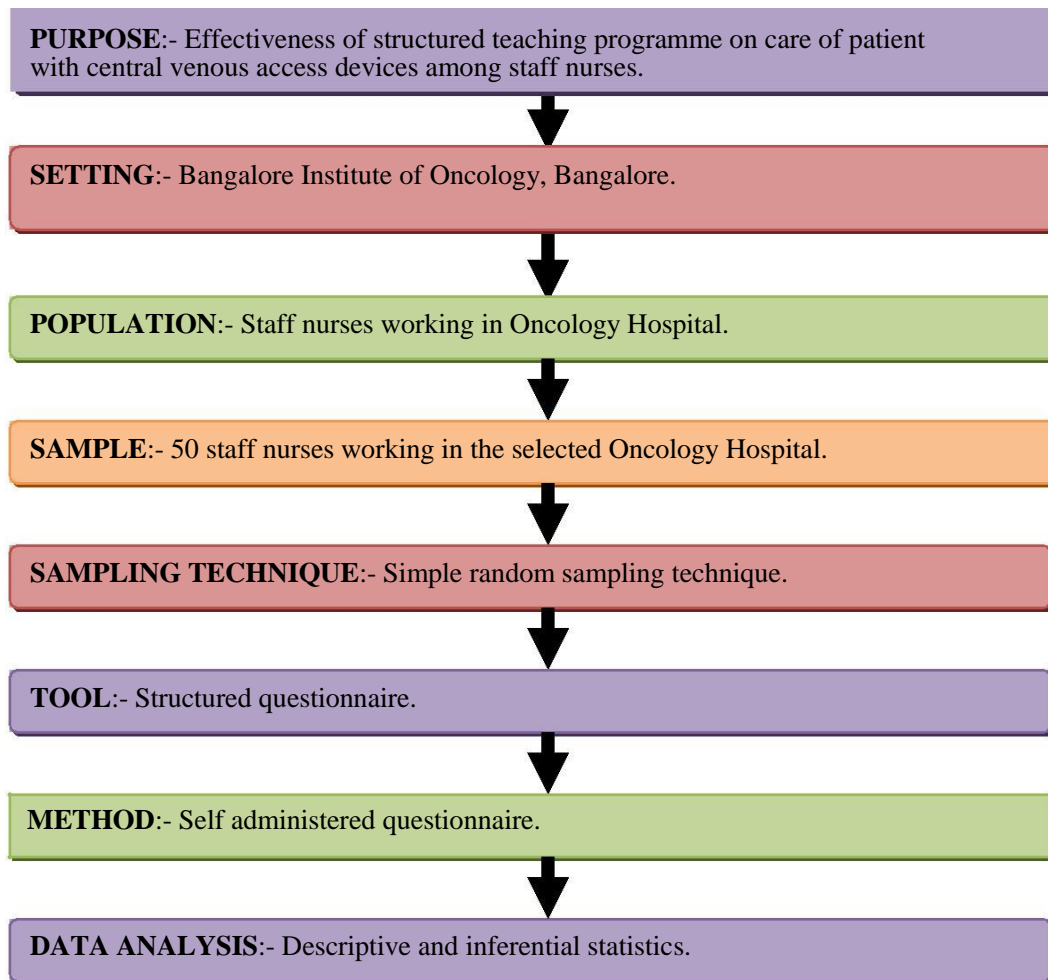


Figure 2. Schematic representation of the research design.

Fig. 2. Schematic representation of research design.

properties. In the present study, the population comprises both male and female staff nurses working in Oncology Hospital, Bangalore.

Sample

Sample is a subset of a population, selected to participate in a study. Staff nurses working in the Oncology Department of the selected oncology hospital of Bangalore made up the study's sample.

Sample size

In this study, the total sample size is 50 samples.

Sampling technique

Sampling is a process of selecting a subset of the population in which the entire population is represented. In the present study, 50 nurses out of 350 nurses working in the oncology hospital were selected with lottery

method of simple random sampling technique. It was suitable keeping in view the time provided for data collection in the study.

Sampling criteria

Inclusion criteria

- Staff nurses working in oncology hospital.
- Staff nurses who are willing to participate in the study.
- Staff nurses with qualification of GNM, B.Sc (N).
- Nurses who are present at the time of data collection.

Exclusion criteria

- Nurses on leave during the period of study.

Self administered questionnaire

The self administered questionnaire consisted of 2 parts: Part 1 deals with the demographic data which consist of

age, gender, educational status, years of experience, designation and exposure to central line education programme. However, the socio demographic data consist of 6 questions. Part 2 deals with knowledge questionnaires related to care of patient with central venous access devices which consist of 40 questions.

The questionnaire was organized into three sub areas:

- i) Concept - 32.5% (13 items);
- ii) Care of patient with central venous access devices - 50% (20 items);
- iii) Complication and its management - 17.5% (7 items).

Each multiple choice question was given 3 options out of which one is the correct response. For every correct response, a score of —one was awarded, and for every wrong response a —zero was awarded. The same questionnaire was used for the assessment of knowledge in pre and post test.

Development of the structured teaching program

The first draft of the Structured Teaching Program was prepared by the investigator by utilizing various sources like: related review of literature, based on opinion and suggestion of experts, discussion with colleague and personal experience in clinical setting, books, journals, etc.

The following steps were adopted for the development of Structured Teaching Program:

- Preparation of Structured Teaching Program;
- Development of criteria rating scale;
- Content validity.

Preparation of first draft of the structured teaching program

The first draft of the Structured Teaching Program was organized under the following headings:

- Concepts of central venous access devices;
- Care of patient with Central venous access devices;
- Complication and its management.

The Structured Teaching Program aimed to improve the knowledge of staff nurses on care of patients with central venous access devices.

Development of criteria rating scale

A criterion rating scale was prepared as a first step toward the development of STP after review of literature and consulting with the subject experts. The areas included in the criteria rating scale were:

- Objectives;

- Selection of content;
- Organization of content;
- Language;
- Practicability and feasibility of the STP.

The criteria rating scale for which the experts were asked to give their rating include very relevant, relevant, needs modification, not relevant and remarks of experts.

Content validity of the structured teaching plan

Content validity of the structured teaching program was validated by eleven experts and had 100% agreement of the contents.

Preparation of final draft of the structured teaching program

After obtaining the suggestions and advices from experts, the final draft of the structured teaching program visual aids were prepared according to the experts suggestions. It included flash cards, hand outs, power point.

Pilot study

Pilot study is a smaller version of a proposed study conducted to refine the methodology. It is developed with similar subjects, the same settings, and same data collection and analysis technique.

Purposes of the study

- To assess the effectiveness of data collection plan and make due modification as required.
- To find out the feasibility of conducting the final study and to determine the methods of statistical analysis.

Formal permission was obtained from the authorities (Medical Superintendent of Bangalore Institute of Oncology 44-45/2, 2nd Cross, Raja Ram Mohan Roy Extension, Off Lalbagh Double Road, Bangalore) prior to the pilot study. 10 staff nurses were selected by lottery method of simple random sampling technique. The study was conducted on 24 August 2009 to 30 August 2009 at BIO in New Building.

Finding of the pilot study

- The total mean percentage of pre-test score was 15.9 with standard deviation of 7.49. The total mean percentage of post test score was 30.6 with standard deviation of 7.22. The mean post test score (30.6) was higher than the mean pre-test score (15.9) with t value (22.27) which was significant at 0.05 level.

- It was found that there was a significant association between knowledge and education status of respondents at 0.05 level with chi-square value (6.6).
- There was no significant association between other

Table 1. Frequency and percentage distribution of age of staff nurse (N=50).

Age of staff nurse	Frequency	Percent
21 - 22 years	17	34
23 - 24 years	15	30
25 - 26 years	10	20
27 years and above	8	16
Total	50	100

demographic variables and knowledge. The finding of the data revealed that this study is feasible.

Procedure for data collection

Data collection is the systematic gathering of information (data) relevant to the research purpose. Formal administration permission was obtained from medical director and nursing superintendent of the hospital prior to data collection. The main study data collection was done from 24 September 2009 to 1 October 2009 in the old building of Bangalore Institute of Oncology, Bangalore. Subjects were selected by lottery method of simple random sampling technique. The nursing superintendent informed all the respondents before conducting the study. The investigator introduced herself and explained the purpose of the study to the staff nurses, then obtained consent and planned the time schedule for collecting the data, after which seating arrangement was made in the lecture hall for the main study. Data were collected by administering self administration tool.

Plan for data analysis

The plan for data analysis is as follows:

- Description of demographic characteristics.
- Findings related to knowledge score of participants.
- Findings related to area wise pre-test and post-test knowledge score of staff nurses.
- Findings related to effectiveness of STP comparing the pre and post test knowledge score.
- Association between knowledge score and demographic variables.

RESULTS AND DISCUSSION

The purpose of this analysis is to identify the knowledge regarding care of patient with central venous access device among staff nurses, so that the research problems can be studied and tested.

Kerlinger (1976) defined analysis as —the categorizing, ordering, manipulating and summarizing of data to obtain assumptions, to research hypothesis questions. ll

Table 2. Frequency and percentage distribution of gender (N=50).

Gender	Frequency	Percent
Male	10	20
Female	40	80
Total	50	100

Table 3. Frequency and percentage distribution of educational status (N=50).

Educational status	Frequency	Percent
G.N.M	30	60
B.Sc Nursing	20	40

The analysis and interpretation of data in this study are based on data collected through self-administered questionnaire (N = 50). The results were computed using descriptive and inferential statistics based on the objectives of the study.

To begin with, the data were entered in a master sheet for tabulated and statistical processing. The data were analyzed and interpreted using descriptive and inferential statistics, after which they were organized as follows:

Demographic profile of staff nurses working in oncology hospitals

Here, this study deals with distribution of participants according to the demographic characteristics. The obtained data on sample characteristics were described under the sub-headings of age, gender, educational status, experience in years, area of experience, and source of education exposure.

Table 1 shows frequency and percentage distribution of age of staff nurses with majority of staff nurses 17 (34%) belonging to the age group of 21-22 years, followed by 15 (30%) belonging to the age group of 23-24 years, 10 (20%) belonging to the age group of 25-26 years and 8 (16%) belonging to the age group of 27 years and above.

Table 2 depicts the gender distribution of staff nurses conducted in this study in which majority of staff nurses were female 40 (80%) and few 10 (20%) were male.

Table 3 shows the educational status of staff nurses conducted in this study. It was observed that majority of staff nurses were G.N.M 30 (60%) and this was followed by B.Sc nurses 20 (40%).

Table 4 shows the experience in years of staff nurses conducted in this study. It was observed that majority of the staff nurses 20 (40%) were having 0-1 years of experience; similarly, 20 (40%) of the staff nurses had 1-2 years of experience. This was followed by 6 (12%) of the staff nurses having 2-3 years of experience and 4

Table 4. Frequency and percentage distribution of experience in years (N=50).

Experience in years	Frequency	Percent
0 - 1 years	20	40
1 - 2 years	20	40
2 - 3 years	6	12
3 years and above	4	8
Total	50	100

Table 5. Frequency and percentage distribution of area of experience (N=50).

Area of experience	Frequency	Percent
Oncology units	30	60
Surgical wards	15	30
Intensive care units	5	10
Total	50	100

(8%) of the staff nurses having more than 3 years of experience.

Table 5 indicates the areas of experience of staff nurses conducted in this study. It was observed that majority of staff nurses 30 (60%) have experience in oncology unit. This was followed by 15 (30%) having experience in surgical wards and 5 (10%) having experience in intensive care units.

Table 6 highlights the education exposure of staff nurses conducted in this study. It was observed that majority of staff nurses 25 (50%) had no exposure to any education. This was followed by 10 (20%) having exposure to workshop; similarly, 10 (20%) had exposure to seminars and 5 (10 percent) had exposure to in-service education.

Area wise knowledge score of nurses on care of patient with central venous access devices by comparison of pre and post information

Area wise knowledge score

The findings related to knowledge score are organized in 2 parts:

- i) Area wise mean pretest knowledge score on care of patient with central venous access devices.
- ii) Area wise mean posttest knowledge score on care of patient with central venous access devices.

Table 7 shows the area wise pre test analysis. It was observed that staff nurses had the highest mean percentage (70%) in the complications and its management, and the lowest mean percentage (66%) in

Table 6. Frequency and percentage distribution of source of education exposure (N=50).

Source of education exposure	Frequency	Percent
Seminar	10	20
Work shop	10	20
In-service education	5	10
Nothing	25	50
Total	50	100

the area of care of patient with central venous access devices with standard deviation of 1.1 and 2.0 respectively. The overall pretest knowledge mean percentage was 67%.

Table 8 shows the area wise post test analysis. It was observed that staff nurses had the highest mean percentage (91%) in the complications and its management and the lowest mean percentage (83%) in the area of concept with standard deviation of 1.2 and 1.6 respectively. The overall post test knowledge mean percentage was 87%.

Comparison of pre-test and post-test

- Comparison of pre test and post test knowledge scores showing enhancement.
- Effectiveness of STP by Paired t test.

H₀: There is significant difference between pre and post test knowledge score of nurses on care of patient with central venous access devices in the selected oncology hospital of Bangalore.

Objective of the study

The objective of this study is to find out the significant difference between pre and post test knowledge score of nurses on care of patient with central venous access devices in selected oncology hospital of Bangalore.

Table 9 shows that the overall mean percent of pre test knowledge score was 67% and post test knowledge score was 87%. The data further support that post test knowledge scores were greater than the pre test knowledge scores. So, there is 20% enhancement in overall knowledge after the structured teaching program.

H₁: There is a significant difference between the effectiveness of knowledge of pre and post group means.

Table 10 reveals that the obtained paired t test value for overall knowledge was found to be 8.5 which is significant at 0.0001 level. It implies that the teaching programme on care of patient with central venous access device among staff nurses is effective.

Table 7. Area-wise pretest knowledge scores.

S/N	Area	No. of items	Mean	Mean (%)	S.D
1	Concept	13	8.9	68	1.5
2	Care of patient with central venous access devices	20	13.2	66	2.0
3	Complications and its management	7	4.9	70	1.1
	Overall knowledge	40	26.9	67	2.8

Table 8. Area-wise post test knowledge scores.

S/N	Area	No. of items	Mean	Mean (%)	S.D
1	Concept	13	10.8	83	1.6
2	Care of patient with central venous access devices	20	17.6	88	1.7
3	Complications and its management	7	6.4	91	1.2
	Overall knowledge	40	34.8	87	2.5

Table 9. Comparison of pre-test and post-test knowledge scores showing enhancement.

S/NArea	Pre test		Post test		Enhance ment	Enhance ment (%)	
	Mean	Mean (%)	Mean	Mean (%)			
1	Concept	8.9	68	10.8	83	1.9	15
2	Care of patient with central venous access devices	13.2	66	17.6	88	4.4	22
3	Complications and its management	4.9	70	6.4	91	1.5	21
	Overall Knowledge	26.9	67	34.8	87	7.9	20

Table 10. Effectiveness of the structured teaching program.

Knowledge score	Mean	SD	t-value	Df	(p-value)
Pre-test	26.9	2.8			
Post-test	34.8	2.5	8.5	49	0.0001

Testing of H_1

There is significant difference between pre test and post test knowledge scores among staff nurses on care of patient with central venous access devices. It indicates that the research hypothesis (H_1) is accepted.

Findings of the association of demographic variables of post knowledge score of staff nurses working in Oncology Hospital

H₂: There is an association between the knowledge of post test with demographic variables such as age, gender, educational status, experience in years, area of experience, and source of education exposure of staff

nurses working in Oncology hospital.

Objective of the study

This study aims to find out the association between knowledge of post test with demographic variables such as age, gender, educational status, experience in years, area of experience, source of education exposure of staff nurses working in oncology hospital.

The obtained χ^2 values (15.394 and 25.149) are greater than the table values (11.34 and 10.83) at 0.01 and 0.001 levels respectively (Table 11). It indicates that there is significance association between post-test knowledge level of staff nurses with age and gender. Hence, the research hypothesis is accepted and the null hypothesis

Table 11. Association between post-test knowledge scores with age and gender.

S/N	Post-Test	Below mean	Above mean	Chi-Value	df	Sig.	Table value	Decision
Age in years								
1	21 - 22 years	4	13	15.394	3	0.01	11.34	S
	23 - 24 years	10	5					
	25 - 26 years	0	10					
	27 years and above	1	7					
Gender								
2	Male	10	0	25.149	1	0.001	10.83	S
	Female	5	35					

Table 12. Association between post-test knowledge scores with educational status and area of experience.

S/N	Post-Test	Below mean	Above mean	Chi-value	df	Sig.	Table value	Decision
Educational status								
3	G.N.M	10	20	0.397	1	0.05	3.84	NS
	B.Sc Nursing	5	15					
Area of experience								
4	Oncology units	9	21	0.317	2	0.05	5.99	NS
	Surgical wards	4	11					
	Intensive care units	2	3					

Table 13. Association between post-test knowledge scores with years of experience and source of education exposure.

S/N	Post-test	Below mean	Above mean	Chi-value	df	Sig.	Table value	Decision
Experience in years								
5	0 - 1 years	10	10	22.222	3	0.001	16.27	S
	1 - 2 years	0	20					
	2 - 3 years	1	5					
	3 + years	4	0					
Source of education exposure								
6	Seminar	5	5	7.142	30.05	0.05	7.82	NS
	Work shop	5	5					
	In-service education	0	5					
	Nothing	5	20					

is rejected.

The obtained χ^2 values (0.397 and 0.317) are lesser than the table values (3.84 and 5.99) at 0.05 level which indicates that there is no significant association between post-test knowledge level of staff nurses with educational status and area of experience (Table 12). Hence, the research hypothesis is rejected and the null hypothesis is accepted.

The obtained χ^2 value (22.222) is greater than the table values (16.27) at 0.001. It indicates that there is

significant association between post-test knowledge levels of staff nurses with years of experience (Table 13). Hence, the research hypothesis is accepted and the null hypothesis is rejected.

The obtained χ^2 value (7.142) is lesser than the table value (7.82) at 0.05 level which indicates that there is no significant association between post-test knowledge level of staff nurses with source of education exposure. Hence, the research hypothesis is rejected and the null hypothesis is accepted.

Testing of H₂

There is a significant association between the knowledge of post test with demographic variables such as age, gender, and experience in years of staff nurses working in oncology hospital. So, the research hypothesis (H₂) is accepted.

The findings are discussed under the following sub headings depending upon the objectives of the study:

1. Demographic characteristics of the samples.
2. Pretest knowledge level on care of patient with central venous access devices.
3. Posttest knowledge level on care of patient with central venous access devices.
4. Effectiveness of 'structured teaching program' on care of patient with central venous access devices.
5. Association between knowledge and selected demographic variables of samples.

Description of demographic characteristics of the sample

The study reveals that majority of staff nurses 17 (34%) belonged to the age group of 21-22 years. It was also observed that majority of the staff nurses were female 40 (80%) and majority of the staff nurses were G.N.M 30 (60%). Most of the staff nurses 20 (40%) were having 0-1 years of experience, majority of staff nurses 30 (60%) are having experience in Oncology unit, and a higher percentage of staff nurses 25 (50%) had no exposure to any education.

Similar findings were found in a study conducted by Haller (1992) that 50% of staff nurses did not get any source of education programme about care of patient with central venous access devices.

Pre test knowledge level on care of patient with central venous access devices

The mean pretest knowledge score of staff nurses on care of patient with central venous access devices is 26.9. This finding is in accordance with that of the study conducted by Cornock (1996) which shows similar mean knowledge score.

Post test knowledge level on care of patient with central venous access devices

The mean post-test knowledge score of staff nurses on care of patient with central venous access devices is 34.8. Similar findings were found in a study conducted by Hadaway (1998) who stated that the mean post test score was 38.7.

Effectiveness of structured teaching program on care of patient with central venous access devices

The mean pre test knowledge score of staff nurses on

care of patient with central venous access devices is 26.9, whereas the mean post test knowledge score is 34.8.

The statistical paired 't' test for overall knowledge was found as 8.5 (p-value = 0.0001) which emphasizes that the difference in the pre and post test knowledge score was found to be statistically significant at 0.0001 level. This implies that the teaching programme on care of patient with central venous access device among staff nurses is effective. Similar findings were found in a study conducted by Gabriel (1996) in which the statistical paired 't' test was found as 8.5 (p-value = 0.0001) which indicates that the teaching programme was effective.

Association between Knowledge and selected Demographic variables of samples

There was statistical significant association between the knowledge and post test with staff nurses' age, gender and years of experience. The researcher accept the null hypothesis for the area of experience, education status and source of education exposure were not associated.

Conclusion

This study reveals that majority of staff nurses 17 (34%) belonged to the age group of 21-22 years, most of the staff nurses were female 40 (80%). Majority of staff nurses were G.N.M 30 (60%), most of the staff nurses 20 (40%) were having 0-1 years of experience, majority of staff nurses 30 (60%) had experience in Oncology unit, and a higher percentage of staff nurses 25 (50%) had no exposure to any education.

The mean pre test knowledge score of staff nurses on care of patient with central venous access devices is 26.9, whereas the mean post test knowledge score is 34.8.

The statistical paired 't' test for overall knowledge was found as 8.5 (p-value = 0.0001) which emphasizes that the difference in the pre and post test knowledge score was found to be statistically significant at 0.0001 level. This implies that the teaching programme on care of patient with central venous access device among staff nurses is effective.

There was statistical significant association between knowledge and post test with staff nurses' years of experience, age and gender. The researcher accepts the null hypothesis which states that the area of experience and source of education exposure were not associated (p-value >0.05). This indicates that there are no differences in education status, area of experience and education exposure.

IMPLICATION OF THE STUDY

The findings of this study have implications in the following areas:

- Nursing practice;
- Nursing education;
- Nursing administration;
- Nursing research.

Nursing practice

The role of staff nurses in care of patient with central venous access device is an important one. Nurses are the one who can provide specialized assessment and interventions to the patients. This study implies that staff nurses can use the knowledge which was gained through structured teaching programme for carrying out the nursing care in an effective manner. From this study, it is seen that nurses should be periodically evaluated to determine their level of knowledge and skill based on which appropriate education programme can be planned (Smeltzer and Bare, 2008).

Nursing education

Implications for nursing education should emphasize more on prospective nurses on care of patient with central venous access devices. Nurses are more educated to be critical thinkers and to take care of patient with central venous access devices. Nurses have a major role in care of patient with central venous access devices where the main objectives are to sustain life and enhance early recovery by preventing potential complications. Hence, to achieve the above objectives, educational programme should include lecture, demonstration and simulated environment which will provide to the nurses in additional knowledge and learning opportunities. The findings of the present study suggest that 'nursing educational programme' need to be specified in the curriculum and in conducting research programme on care of patient with central venous access devices (Black and Jacobs, 2001).

Nursing administration

Administration plays a major role in regulating and coordinating the laws. The quality of an administrator is determined by the quality of her subordinates. A nursing administrator has a significant role in encouraging and motivating the staff nurses to improve their knowledge in order to keep in pace with changing needs of the society. Nurse administrators need to encourage and plan for staff development programme in the care of patient with central venous access devices. This programme will promote efficient use of hospital resources and encourage cost effectiveness for the patients with central venous access devices.

Nursing research

The deficiencies in the knowledge among nurses can

result in poor quality of services to the clients. The findings of the present study can form a basis for future research. Research will not only help nurses in improving their knowledge but also refine their quality of care provided to the patient. The findings of this study serve as a basis for the professional and the student nurses to conduct the future quantitative and qualitative research on knowledge of staff nurses regarding care of patient with central venous access devices.

RECOMMENDATIONS

- A similar study can be replicated on a large sample for wider generalization.
- It is the responsibility of nurse teachers, clinical supervisors, nurse administrators and policy makers to make adequate facilities to increase the inputs of learning in different nursing programmes.

LIMITATIONS OF THE STUDY

- The sample size was restricted due to administrative constraints.
- This study was limited to the staff nurses working in Bangalore Institute of Oncology.
- The knowledge of staff nurses was assessed only through the self administered questionnaire.

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