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Evaluate the Effectiveness of Structured Teaching Programme on Knowledge regarding Intravenous Access Care among Nursing Students: Pre-Experimental Research Design

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Abstract: ***Introduction: Intravenous access devices are used to administer fluids and medications among patients undergoing long term treatment, especially chemotherapy. Though it has many advantages, they are not free from complications such as sepsis, thrombotic complications, local tissue damage etc. Aim: The aim of the study is to evaluate the effectiveness of structured teaching programme on knowledge regarding intravenous access care among nursing students of University College of Nursing, Faridkot, Punjab. Materials and Methods: A quantitative approach with Pre- experimental (one group pre-test post-test research design) was used. The 50 samples were selected using convenient sampling technique from the University College of Nursing, Faridkot, Punjab. Self-structured knowledge questionnaire was used to assess the pre-test knowledge level and after providing structured teaching programme the post-test knowledge level was checked with the help of self-structured knowledge questionnaire after 7 days. Results: The mean score of knowledge regarding Intravenous access care was increased from 9.5 to 18.8 in the post test after structured teaching programme. The results show that there is statistically significant increase in post-test mean score after structured teaching programme. Conclusion: Hence, it is concluded that the structured teaching programme was effective. The knowledge regarding Intravenous access care among nursing students was improved with structured teaching programme.***

Keywords: Intravenous access care, knowledge, effectiveness, structured teaching programme, nursing students

1. Introduction

Intravenous therapy is one of the most frequently used therapeutic intervention performed in hospital settings. It is used to administer fluid, nutrients, medications or other medical therapy such as blood products or electrolytes to correct electrolyte imbalance directly into the veins. [1] Intravenous access can be of two type: Peripheral intravenous cannulation and Central venous catheter.

Peripheral intravenous cannulation is a procedure in which a thin hollow plastic tube is inserted into the patient's veins for the short-term administration of drugs, fluids, blood, nutrition. [2] Although it is an easy and uncomplicated procedure, but sometimes microbes may enter the blood stream through broken skin or vein wall. The common complications associated with peripheral intravenous cannulation is phlebitis, infiltration and thrombus formation that can further increase the hospital stay.[3]

Central venous catheter (CVC) are integral part of patient treatment admitted in intensive care unit. CVC is used for long term administration of antibiotics, Total Parental Nutrition, chemotherapy, Blood transfusion and frequent blood sampling. CVC is a thin, flexible indwelling tube inserted into large, central vein such as internal jugular, subclavian or femoral vein.[4] It is a deeply invasive procedure which possess significantly higher risk of infection than peripheral catheters. The complications associated with CVC are thrombosis, thrombophlebitis, extravasation, and Central line associated blood stream infection (CLABSI).[5]

These complications can be minimized by following standard practice, having adequate knowledge, proficiency in carrying out procedure, inspection of cannula site and frequent dressing changes. Inspection of the site should be done by visual Phlebitis scale. The dressing must be kept clean, dry, intact, and secure. Lumen of catheter should be flush with heparin or saline solution.[6]

Majority of nurses know how to insert cannula but fails to take care of insertion site due to many reasons like increased workload, negligence and lack of knowledge and practice to maintain the peripheral intravenous line. Nursing student and nursing staff are the primary caregiver who play a vital role in assessing the cannula. Due to inadequate knowledge regarding the assessment of intravenous cannula this leads to various complications such as thrombophlebitis, infiltration, extravasation and bloodstream. To prevent these infections and complications and to prevent the death due to inadequate assess of cannula, Investigator choose this study. The aim of the study is to determine and assess the knowledge of students regarding intravenous access care and enhance their knowledge by providing structured teaching program.

2. Material and Methods

The pre-experimental, one group pre and post-test design was used for the study. The study was conducted in the month of June 2023.

Inclusion Criteria
B.Sc. Nursing 2nd year students who were willing to participate.

Exclusion Criteria
Students who were absent at the time of data collection.

Sample and sample technique
50 students enrolled in B.Sc Nursing 2nd year were selected for the present study with convenient sampling technique.

Phase I Selection of sample (Pretest)
The sample selection was done using non-probability Convenient sampling technique. The students were given a self-administered questionnaire. Pretest on knowledge (20-25min) was conducted.

Phase II planned teaching programme intervention for the study group
The intervention was given to students after pre-test on the same day in the class room of B.Sc. Nursing 2nd year student after a formal written permission. The lecture was delivered by using power point presentation using lecture cum discussion method.

Phase III (Post- test)
On the 7th day after Structured Teaching Programe, the post-test was conducted with the same group by using the same tool for knowledge.

Description of tool
Section I- It consist of age, gender, any previous teaching attending regarding IV access care.
Section II- It consist of self-structured knowledge questionnaire consisted of 25 self-administered multiple-choice questions for Knowledge.
It includes six components of IV access care.
Knowledge on venous system, selection of vein and cannula, pre-cannulation Procedure, IV Cannula insertion, Post-cannulation procedure and complication.

Scoring and interpretation

Level of Knowledge	Score	Percentage
Good	>19	>75%
Average	16-18	61-74%
Poor	≤15	<60%

Maximum Score- 25 **Minimum Score-0**

Each item had a single correct answer. Every correct answer was awarded score of one and every wrong was given zero score. The maximum score was 25 and minimum possible score was 0.

Analysis
The collected data were group and analyzed by descriptive statistics (Frequency, Percentage, mean, standard deviation) and inferential statistics paired t test was used to determine the difference between pre and post test score.

3. Results

Table 1: Distribution of study subject according to demographic variables, N = 50

Characteristics/ variables		Frequency	Percentage
Age (in years)	16 - 18	13	26%
	18 - 20	37	74%
Gender	Male	0	0%
	Female	50	100%
Any previous knowledge regarding Intravenous access care	Yes	37	74%
	No	13	26%

Table 1 Shows the distribution of study subjects according to demographic variables. In present study Majority of the subjects (74%) were in the age group of 16 -18 years, followed by 26% subjects between18-20 years. All the subjects were females. In present study most if the subjects (74%) had previous knowledge regarding intravenous access care whereas less than one-third had no previous knowledge regarding intravenous access care.

Table 2: Frequency and percentage distribution of pre-test and post-test knowledge score of subjects regarding intravenous assess care, N=50

Level of Knowledge	Range	Pre-test	Pre-test percentage	Post test	Post-test Percentage
Good	≥19	2	4%	27	54%
Average	16-18	17	34%	16	32%
Below average	≤15	31	62%	7	14%

It was seen that during pre-test near to two-third of subjects (62%) were having below average knowledge, 34% subjects had average knowledge and only 4% were having good knowledge regarding Intra venous assess care. After structured teaching programme, the knowledge of subjects increased.

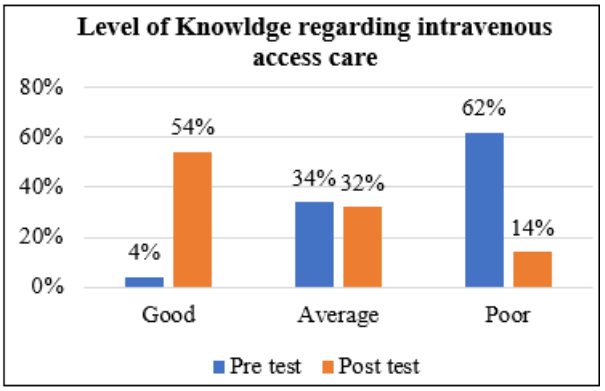

Figure 1: Bar graph showing the Pre-test and Post-test knowledge of subjects regarding Intravenous access care

Table 3: Mean, standard deviation of pre-test and post-test knowledge score of subjects regarding intravenous assess care, N=50

	Mean	Std. Deviation	Paired T test value	df	P value
Pre-test knowledge	9.5	6.29	8.17	49	0.0001
Post-test knowledge	18.8	2.77			

Finding revealed that the mean post-test score (18.8) of students was higher than mean pre-test score (9.5). The statistical paired 't' test for overall knowledge was found as 8.17 (p value=0.0001) which emphasizes that difference in the pre and post-test knowledge score was found to be statically significant at <0.05. Hence the null hypothesis is rejected.

4. Discussion

The finding indicated that before the intervention, significant proportion of students had only below average knowledge (62%), with 34% subjects had average knowledge and only 4% were having good knowledge regarding Intravenous

access care. Post-intervention, there was marked improvement with, more than half (54%) had good knowledge,32% had average knowledge and 7% had poor knowledge.

A similar study was conducted on the effectiveness of Structured Teaching Programme on Knowledge regarding Intravenous Cannulation among the Staff Nurses. A sample of 60 staff nurses were selected by using convenience sampling technique. The findings reveled that majority (86.7%) of the staff nurse had adequate knowledge in the post-test.[7]The finding is also consistent with study conducted by Subin S. on effectiveness of Structured Teaching Programme on knowledge regarding Intravenous Cannulation and its complications among staff nurses working in a selected hospital of Bhopal which revealed that pre-intervention 48.3% staff nurses had poor knowledge, 30% had average level of knowledge. Whereas after Structured Teaching Programme it is observed as near to half (45%) had good level of knowledge.[8]

In present study the finding revealed that the mean post-test score of nursing students was significantly higher than the mean pre-test score. The statistical paired 't' test for overall knowledge was found as 8.17 (p value=0.0001) which emphasizes that difference in the pre and post-test knowledge score was found to be statically significant at <0.05. these finding are consistent with the study conducted by Varinder K, Jasbir K, Devi TR (September 2019) titled cross-sectional interventional study to assess the Effectiveness of a Training Teaching Programme on Intravenous Cannula Therapy. A total of 30 samples were taken and training was given to them using a combination of different teaching methods. The findings of this study shown that there was highly statistically significant relation between pre-test scores (10.4 ± 2.26) and mean post-test scores (17.34 ± 1:325).[9]

5. Conclusion

The study demonstrated that a structed teaching program significantly enhance the knowledge of nursing students regarding intravenous access care. This is evident from the substantial increase in post-test knowledge scores and compared to pre-test scores. Educational interventions are crucial in bridging knowledge gaps and improving clinical practice among nursing students. Continuous education is an integral component of nursing practice to ensure high standard of patient care and safety.

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