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Research Article

Exploring The Effectiveness Of Lecture Cum Demonstration In Improving Nursing Students' Competency In Iv Cannulation And Care

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ABSTRACT

This study is mainly concerned about the care and maintenance of peripheral intravenous cannulation: to determine the knowledge and practice of nurses towards care and maintenance of IV cannula and to find out the obstacles encountered in caring and maintaining IV cannula. Intravenous cannulation is a common procedure performed by nurses in every hospital and closely associated with the risk of nosocomial infections if standard care is not provided. Nurses are the frontline health care providers in all hospital settings and nurses performing the IV cannulation procedure should be well trained as many complications can arise from intravenous cannulation. An experimental research design was used in the study. Total 60 nursing students were enrolled using total enumeration sampling technique. The self-structured knowledge questionnaire and OSCE checklist were adopted to collect the data regarding intravenous cannulation and its care. Data were collected from 19 February 2024 to 28 February 2024. The obtained data was analysis by using descriptive and inferential statistics and SPSS software. The Pre-test knowledge were notify that mean 16.75, standard deviation is 3.93 and minimum value 6.00 or maximum value is 25.00. The Post-test knowledge were notify that mean 26.30, standard deviation is 4.27 and minimum value 13.00 or maximum value is 35.00. Pre-test practice were notify that mean 20.51, standard deviation is 6.57 and minimum value 6.00 or maximum value is 33.00. The Post-test practice were notify that mean 39.50, standard deviation is 5.05 and minimum value 15.00 or maximum value is 48.00. After completing this study, study came to the conclusion that the students of B.Sc. Nursing in a selected university in Dehradun, Uttarakhand, had little understanding of cannulation and it's care.

INTRODUCTION –

The skill of intravenous cannulation must be practiced regularly to maintain a high level of competency. This is important to gain quick and efficient intravenous access in populations when required. The insertion of intravenous catheters into peripheral veins is probably the most commonly performed invasive medical procedure in hospitals. This procedure could be difficult sometimes requiring several attempts and causing distress to patients. Health care professionals are expected to have a basic understanding of all procedures performed on the patient. Their knowledge has direct implications on patients' morbidity. Intravenous cannula is a little plastic tube that has been mounted on a needle for insertion into the client's vein that requires frequent access to the blood stream. Intravenous cannula insertion needs a sterile technique as it enters into the client's vein. Intravenous cannulation and its care are a therapeutic procedure in patient care. Nurses should be skillful and show enough expatriation in intravenous cannulation to reduce tissue damage, blood loss, frequent punctures into the vein as it enhances health, reduce complications and duration of hospitalization of the clients. Nurses are responsible for the insertion, manipulation, infusion, intact maintenance, care of catheter and safe removal. Intravenous cannulation is one of the most common invasive procedures that nurses perform and it carries with it a high risk of complication. For example, phlebitis rates

reported for patients receiving intravenous therapy have been as high as 80% with the rates in most hospitals ranging between 20% and 80%.

MATERIAL AND METHOD –

A quantitative research approach with a quasi- experimental (pre-test and post-test) research design was adopted in this study to assess the effectiveness of lecture cum demonstration regarding cannulation and its care among nursing students in selected university of Dehradun, Uttarakhand. The study was conducted in SON 1st semester, Dev Bhoomi Uttarakhand University of Dehradun, Uttarakhand. The sample size for the present study was 60 students of B.Sc. nursing 2nd semester. Students who were available and willing to participate in the study were included while students who were absent due to any medical condition were excluded from the study. For this study Demographic Performa, Self-structured knowledge questionnaire & OSCE Checklist tools were prepared to assess the effectiveness of lecture cum demonstration regarding cannulation and it's care among nursing students. Content validity was established by obtaining the suggestions from the field validators The tool was sent along with the research objectives and criteria checklist to 5 experts of similar fields to validate the tool from medical surgical nursing. Written permission was obtained from the principal Dev Bhoomi Institute of Nursing and School of Nursing, ethical committee of Dev Bhoomi Uttarakhand University, Dehradun, Uttarakhand. The written consent was obtained from each study participants before starting data collection. After getting administration approval and ethical clearance from ethical committee tools were administered to 60 students of B.Sc. nursing. The data was collected from 19th February 2024 to 28th February 2024.The analysis was done as per the objectives. Data analysis was done by using descriptive and inferential statistics and SPSS software.

RESULT - Section A

Table no1: -Frequency and percentage distribution of demographic characteristic of study participants.

n=60

S.NO	Demographic variable		Frequency	Percentage %
1.	Age	18-20	53	88.4%
		21-23	7	11.7%
2.	Gender	Female	23	38.3%
		Male	37	61.7%
3.	Educational medium	Hindi	30	50%
		English	30	50%
4.	Father Occupation	Self Employed	24	40%
		Government	20	33.3%
		Private	16	26.7%
5.	Mother Occupation	Home-maker	50	83.3%
		Government	7	11.7%
		Private	3	5%
6.	Previous knowledge	Yes	17	28.3%
		No	43	71.7%

Table No 1 Manifest demographic of the study participants. It depicts that of major portion i.e (88.4%) of participants belonged to 18-20 years, majority 37(61.7%) are males, 30 (50%) belongs to Hindi medium and 30(50%) belongs to English medium, majority 24(40%) having father occupation Self-employed, majority 50(83.3%) having mother occupation home maker, 43(71.7%) having no previous knowledge.

Section B

Table No 2: - Pre-test and Post-test Knowledge level

S. no.	Knowledge Level	Pre Test		Post Test	
		Frequency	Percentage (%)	Frequency	Percentage (%)
1	Inadequate (0-20))	51	85%	6	10%
2	Moderate (21-30)	9	15%	45	75%
3	Adequate (31-40)	0	0%	9	15%

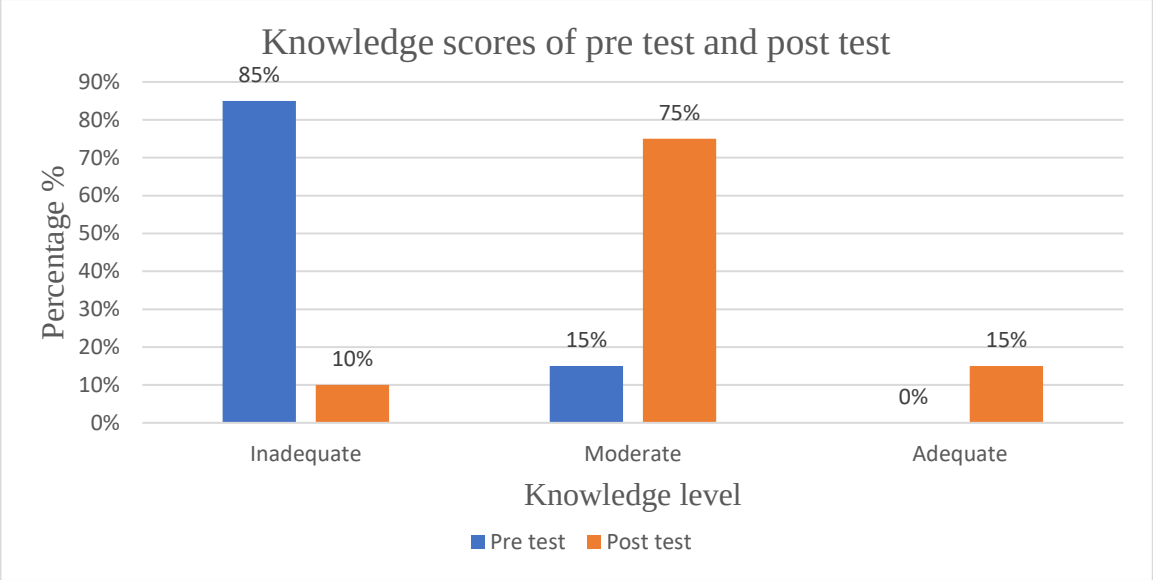

Table 2 Manifest Pre-test and post-test knowledge level of Participants. It depicts that of major portion of the pre-test is (0%) of participants had adequate knowledge, few participants (15%) had moderate knowledge and majority of participants (85%) had inadequate knowledge and here by the post-test depict that 15% of participants had adequate knowledge, majority of participants (75%) had moderate knowledge and few of participants (10%) had inadequate regarding intravenous cannulation and it's care.

Table No 3:- Pre-Test and Post-test practice level of Participants.

n=60

S. no.	Practice Level	Pre-Test		Post-Test	
		Frequency	Percentage (%)	Frequency	Percentage (%)
1	Substandard (0-25)	49	31.7%	1	1.7%
2	Average (26-35)	11	18.3%	8	13.3 %
3	Standard (36-50)	00	0%	51	85.0%
4	TOTAL	60	100%	60	100%

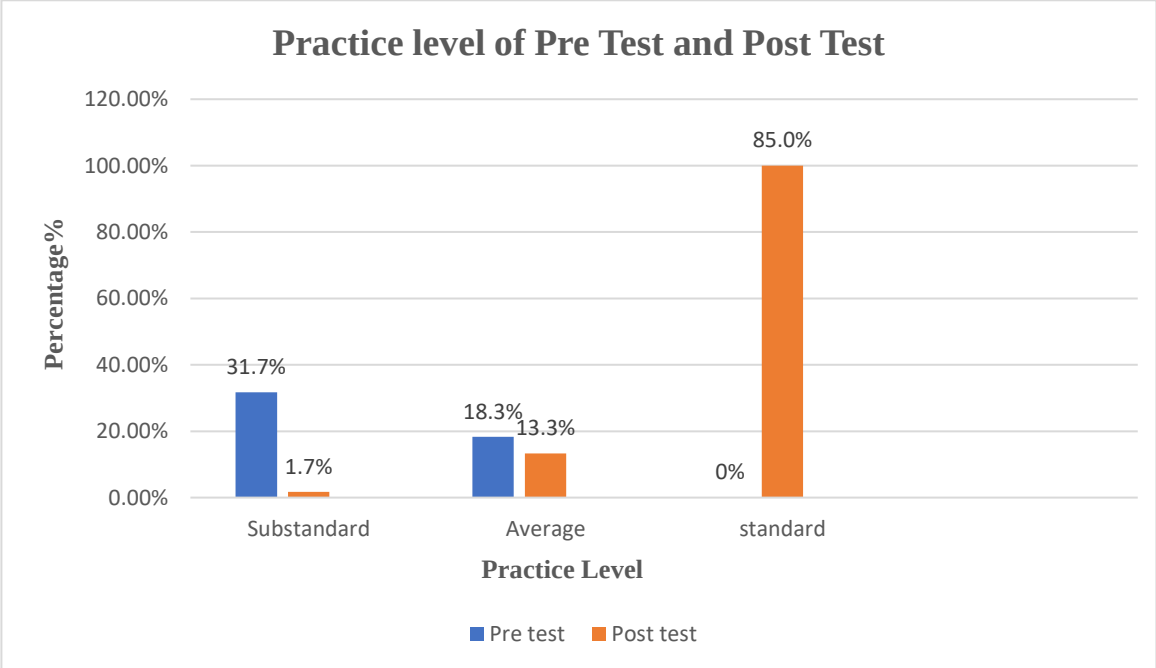

Table 3 Manifest Pre-test and post-test knowledge level of Participants. It depicts that of major portion of the pre-test is (0%) of participants had standard practice level, few participants (18.3%) had average practice level and only (31.7%) participants had substandard practice level and here by the post-test depict that majority

(85.0%) of participants had standard Practice level, only (13.0%) participants had average practice level and few of participants (1.7%) had substandard practice level regarding intravenous cannulation and it's care.

Section C

Table No 4 :- Mean and Standard deviation of the knowledge score of participants.

n=60

Group	Mean	Standard deviation	Minimum	Maximum
Pre-test	16.75	3.93	6.00	25.00
Post-test	26.30	4.27	13.00	35.00

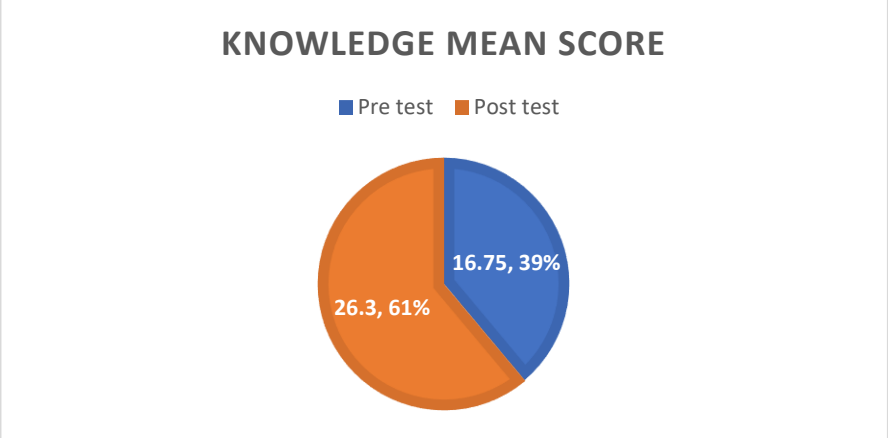

Table no 4 manifest the mean, median and standard deviation of the knowledge of the study participants. revealed that the obtain range of Pre-test knowledge were notify that mean 16.75, standard deviation is 3.93 and minimum value 6.00 or maximum value is 25.00. The Post-test knowledge were notify that mean 26.30, standard deviation is 4.27 and minimum value 13.00 or maximum value is 35.00.

Table No 5 :- Mean and Standard deviation of the practice score of participants.

n=60

Group	Mean	Standard deviation	Minimum	Maximum
Pre test	20.51	6.57	6.00	33.00
Post test	39.50	5.05	15.00	48.00

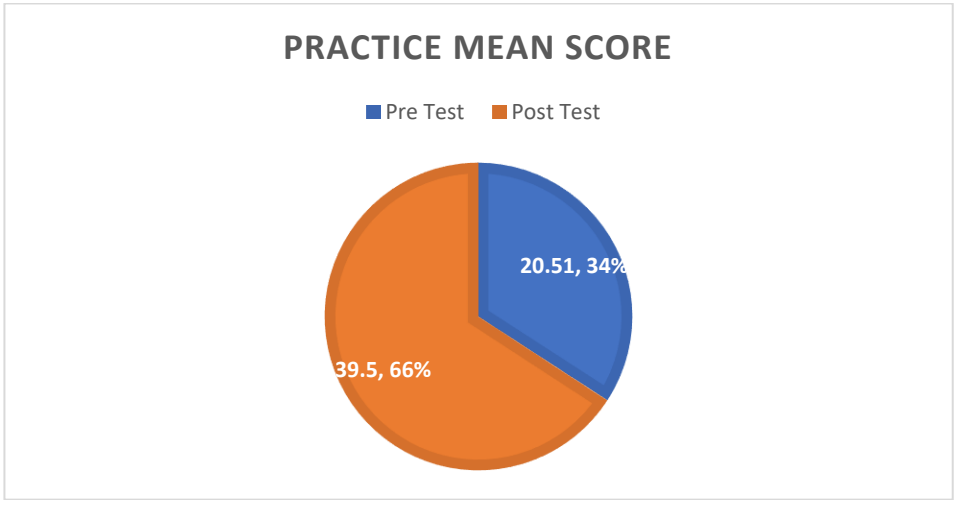

Table no 5 manifest the mean, median and standard deviation of the knowledge of the study participants. revealed that the obtain range of Pre-test practice were notify that mean 20.51, standard deviation is 6.57 and minimum value 6.00 or maximum value is 33.00. The Post-test practice were notify that mean 39.50, standard deviation is 5.05 and minimum value 15.00 or maximum value is 48.00.

Table No 6: - Effectiveness of Knowledge on lecture cum demonstration.

n=60

Variable	Mean	df	't' value	P value
Pre-Test	16.75	59	-15.88	0.000
Post-Test	26.30			

Table 6 manifest that effectiveness of knowledge on lecture cum demonstration depict that the pre-test mean value is 16.75 and post-test mean value is 26.30, Df value 59, t value is -15.88 and p value is 0.000.

Table No 7: - Effectiveness of Practice on lecture cum demonstration.

n=60

Variable	Mean	df	't' value	P value
Pre-Test	20.51	59	18.26	0.000
Post-test	39.50			

Table 7 manifest that effectiveness of knowledge on lecture cum demonstration depict that the pre-test mean value is 20.51 and post-test mean value is 39.50, Df value 59, t value is -18.26 and p value is 0.000.

Table no 8: - Findings related to association between pre-test knowledge score with their demographic variable.

n=60

S.NO	Demographic variable		Inadequate	Moderate	Chi square value	DF value	p-Value	Inference
1.	Age	18-20	48	5	11.110	2	0.00	**S***
		21-23	3	4				
2.	Gender	Female	19	4	0.167	1	0.68	NS
		Male	32	5				
3.	Educational medium	Hindi	26	4	0.131	1	0.71	NS
		English	25	5				
4.	Father Occupation	Self Employed	21	3	0.294	2	0.86	NS
		Government	17	3				
		Private	13	3				
5.	Mother Occupation	Home-maker	42	8	0.571	3	0.90	NS
		Government	6	1				
		Private	3	0				
6.	Previous knowledge	Yes	14	3	0.130	1	0.71	NS
		No	37	6				

Table no 8 Despite the association between pre-test knowledge score and demographic data. The demographic variable age were found to be significantly association with the pre-test knowledge score. Hence accept the research hypothesis and reject null hypothesis.

Table no 9: - Findings related to association between pre-test practice score with their demographic variable.

n=60

S.NO	Demographic variable		Sub-standard	Average	Chi square value	DF value	p-Value	Inference
1.	Age	18-20	43	10	0.329	2	0.848	NS
		21-23	6	1				
2.	Gender	Female	17	6	1.498	1	0.22	NS
		Male	32	5				
3.	Educational medium	Hindi	23	7	1.002	1	0.317	NS
		English	26	4				

4.	Father Occupation	Self Employed	18	6	1.224	2	0.54	NS
		Government	17	3				
		Private	14	2				
5.	Mother Occupation	Home-maker	42	8	3.667	3	0.30	NS
		Government	4	3				
		Private	3	0				
6.	Previous knowledge	Yes	15	2	0.684	1	0.408	NS
		No	34	9				

Table no 8 Despite the association between pre-test practice score and demographic data. There is no significance association between pre-test practice and demographic data. Hence accept the research hypothesis and reject null hypothesis.

CONCLUSION –

Cannulation is the act of inserting a catheter into a vein or bodily cavity to allow for a number of medical procedures, including blood sampling and intravenous therapy. It is an essential nursing skill. Sufficient cannulation knowledge and competence are required to ensure patient safety and comfort while reducing complications such as infection, phlebitis, and infiltration. As part of the understanding evaluation procedure, students' theoretical knowledge as well as their practical skill with cannulation techniques were tested. Using a mixed-methods approach, the study evaluated nursing students' practical competencies and depth of knowledge via qualitative interviews and quantitative surveys. The findings revealed that many of the participants struggled to grasp essential concepts such as the architecture of the circulatory system, how to select a suitable location, and the specific procedural approaches required for effective cannulation. Furthermore, many students were unaware of cannula site maintenance protocols, such as cleaning and monitoring for potential problems. This lack of knowledge could be caused by a variety of factors, including gaps in the nursing curriculum, a lack of opportunities for practical training, or a lack of exposure to clinical circumstances in which these talents are required. Nursing education plays an important role in developing competent healthcare providers; hence curricula should be improved to include more extensive training on cannulation methods and care. To summarize, bridging this educational gap is critical for increasing nursing students' skill in cannulation and its management, which will eventually enhance patient outcomes and clinical safety. Subsequent research may look into the efficacy of targeted educational interventions aimed at improving students' comprehension and performance in this critical area of nursing practice.

Conflict of Interest - Author declares no any conflict of interest.

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