Effectiveness of Video Assisted Teaching Regarding Knowledge and Practice of Intra-Venous Cannulation for Under-five Children

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Abstract: *Intravenous cannulation is a very common therapeutic procedure performed by nurses in patient care. The present study was conducted with an objective to evaluate effectiveness of video assisted teaching regarding knowledge and practice of intravenous cannulation for under five children among staff nurses in selected hospital at Patiala. Sixty staff nurses (30 each in experimental and control group) were selected using purposive sampling technique. A quasi experimental research design was adopted. The tools used for data collection were self administered structured knowledge questionnaire and structured practice checklist on I.V. Cannulation. The mean post-test knowledge score, 23.4, of staff nurses in experimental group was significantly higher than the mean pre-test knowledge score, 19.2 with calculated 't' of 2.97. The data further reveals that the mean post-test practice score, 22.43 of staff nurses in experimental group was significantly higher than the mean pre-test practice score, 16.36 with calculated 't' of 8.43. Whereas the mean pre-test and post-test knowledge and practice score of staff nurses in control group was not significantly different with calculated 't' of 0.04. Thus, the video-assisted teaching programme regarding intravenous cannulation for under five children was effective in enhancing the knowledge and improving the practice of staff nurses.*
Keywords: *Video-Assisted teaching Programme, Knowledge, Practice, Intra-venous Cannulation,*

I. Introduction

Nurses do various functions in their routine work in the clinical setting and one among them is Intravenous cannulation and it is a very common therapeutic procedure in patient care. Nurses are responsible for the insertion, manipulation, infusion, intact maintenance, care of catheter and safe removal. Nurses should be skillful and show enough expertise in intravenous cannulation to reduce tissue damage, blood loss, frequent punctures into the vein as it enhance health, reduce complications and duration of hospitalization of the clients.

Cannulation can be performed at the scene of an emergency by first responders who want to make sure that they will have access to a vein and it is also routinely done in hospital settings. Intravenous cannulation is one of the earliest skills learned by health care providers like doctors, nurses, and paramedics. In the case of fluid, electrolyte, and acid-base imbalance, the nurse must have adequate knowledge on physiology, pathophysiology, pharmacology and previous experience on peripheral intravenous cannulation. The nurse must also have critical thinking attitudes to identify, diagnosis and to plan successful interventions.

II. Statement Of Problem

A study to evaluate the effectiveness of video assisted teaching regarding knowledge and practice of intravenous cannulation for under five children among staff nurses in a selected hospital at Patiala.

Objectives
➤ To assess the knowledge and practice of intravenous cannulation of under five children among staff nurses in the control group and experimental group before and after the intervention.
➤ To correlate the knowledge and practice of intravenous cannulation of under five children among staff nurses in between before and after intervention in both groups.

Hypothesis
H_0- There will be no significant difference between knowledge and practice score of control and experimental group before and after intervention.
H_1 -There will be significant difference between knowledge and practice score of experimental and control group before and after intervention.
H_3- There will be a significant relationship between knowledge and practice score of staff nurses regarding intra venous cannulation at 0.05 level of significance.
Conceptual Framework
Based on Ludwig Von Bertalanffy's General System Theory

III.   Methods And Materials

***Research approach*:** A quantitative research approach
Research design: Quasi-experimental design
Research setting of study: Rajindra hospital, Patiala.
Variables under study
✓   ***Independent variable****:* Video Assisted Teaching Program
✓   ***Dependent variable***: Knowledge and Practice of staff
Sample size: 60 staff nurses (30 staff nurses each in experimental and control group)**.**
Sampling technique: Purposive sampling technique
Inclusion criteria
Staff nurses who;
✓   work in paediatric ward of selected hospital, Patiala.
✓   can read and write English.
✓   were present during the period of data collection.
✓   were willing to participate in the study.
✓   were registered with state registration council.
Data Collection tool and technique: Self Administered structured knowledge questionnaire and an observational check-list
Ethical consideration-
Prior to the study,
➢   Permission was obtained from the research committee of Adarsh College of Nursing, Patiala and the authorities of selected hospitals, Patiala.
➢   Informed consent was obtained from the staff nurses who are willing to participate in the study.
➢   Anonymity and confidentiality of the study participants was maintained.

IV.   Results

Table 1 indicates maximum numbers of staff nurses 21(70%)in control group and 18(60%) in experimental group were in age of 18-28 years. Most of staff nurses 16(53.30%) in control group and 20 (66.67%) in experimental group belongs to sikh religion. Maximum numbers of staff nurses 17 (56.67%) in control group, 13 (43.33%) in experimental group were G.N.M. Most of staff nurses are married 16 (53.33%)in control group, 19 (63.33%) in experimental group. Majority 18 (60%) in both groups of staff nurses had income of Rs. 10000-15001/month. Maximum staff nurses work experience 19 (63.34%) in control group, 21 (70%) in experimental group were 0-5 years. Maximum of staff nurses 28(93.33%) in control group and 27(90%) in experimental group had not attending the programme on intravenous cannulation.

Table-1: *Frequency and Percentage distribution of staff nurses*

N=60

Socio demographic variables	Control group		Experimental group	
	Frequency (f)	**Percentage (%)**	**Frequency (f)**	**Percentage (%)**
Age in years				
18-28	21	70.00	18	60.00
29-39	05	16.67	08	26.67
40-50	02	06.66	02	06.66
51-60	02	06.66	02	06.66
Religion				
Sikh	16	53.33	20	66.67
Hindu	10	33.33	06	20.00
Muslim	02	06.66	02	06.66
Christian	02	06.66	02	06.66
Other	00	00.00	00	00.00
Education				
G.N.M.	17	56.67	13	43.33
P.B.Sc. Nursing	10	33.33	12	40.00
B.Sc. Nursing	03	10.00	05	16.66
M.Sc. Nursing	00	00.00	00	00.00
Marital status				
Married	16	53.33	19	63.33
Unmarried	08	26.66	05	16.66
Widow	04	13.33	04	13.33
Divorced	02	06.66	02	06.67
Monthly Income				
<10000	03	10.00	03	10.00
10001-15000	18	60.00	18	60.00

15001-20000	04	13.33	04	13.33
>20000	05	16.67	05	16.67
Clinical work experience				
0-5 Years	19	63.34	21	70.00
>5-10 Years	07	23.34	05	16.66
>11-15 Years	01	03.33	01	03.33
Above 15 Years	03	10.00	03	10.00
Pediatric ward experience				
0-5 Years	24	80.00	26	86.66
>5-10 Years	03	10.00	02	06.67
>11-15 Years	02	06.67	01	03.33
Above 15 Years	01	03.33	01	03.33
In-service education(IV cannulation)				
Yes	02	06.67	03	10.00
No	28	93.33	27	90.00

Table 2 depicts the knowledge score of experimental group of staff nurses of under five children pre-test was 19.2, standard deviation was 5.42, median was 19.5 and the range was 09-28. The knowledge score of experimental group of staff nurses of under five children pre-test was 23.4, standard deviation was 5.51, median was 23.5 and the range was 11-34.

Table 2: *Range, Mean, Median and SD score of pre-test and post-test knowledge score of staff nurses.*

N=60

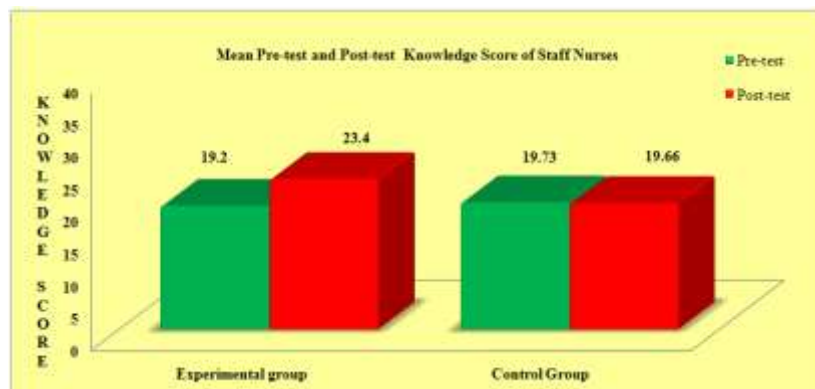|		Range	Mean	Median	SD
Experimental Group	Pre-test	9-28	19.2	19.5	5.42
	Post-test	11-34	23.4	23.5	5.51
Control Group	Pre-test	9-29	19.73	20	5.04
	Post test	10-28	19.66	21	5.32

Maximum Score=40

Fig.1- Bar Graph Showing the Mean Pre-Test and Mean Post-Test Knowledge Score obtained by Staff nurses

The data presented in table 3 reveals that the mean post-test knowledge score of staff nurses regarding intravenous cannulation was 23.4 and the mean pre-test knowledge score was 19.2 with the mean difference of 4.2. The calculated 't' of 2.97 was found statistically significant at 0.05 level which represents that the mean difference between pre-test and post-test knowledge score was true difference and not by chance. The data further reveals that the mean post-test knowledge score of staff nurses regarding concepts 0f intravenous cannulation was 19.66 and the mean pre-test knowledge score was 19.73 with the mean difference of 0.07. The calculated 't' of 0.04 was found statistically not significant at 0.05 level which represents that the mean difference between pre-test and post-test knowledge score was not true difference and is by chance. Therefore, null hypothesis H_{01} was rejected and research hypothesis H_1 was accepted.

Table 3: *Mean, Mean Difference and Standard Error of Mean Difference and 't' of Pre-test and Post-test Knowledge Score of staff nurses*

N=30

	Knowledge score	Mean	M_D	SD_D	SE_{MD}	't'
Experimental group	Pre-Test	19.2	4.2	3.01	0.09	2.97*
	Post-Test	23.4				
Control group	Pre-Test	19.73	0.07	0.28	0.09	0.04
	Post-Test	19.66				

't' (29) = 2.05, *Significant (p $\leq$0.05)

Table 4 depicted that the practice score of experimental group of staff nurses of under five children pre-test mean was 16.36, standard deviation was 2.82, median was 16 and the range was 09-22. practice score of experimental group of staff nurses of under five children post-test mean was 22.43, standard deviation was 2.76, median was 22.43 and the range was 15-28. The practice score of control group of staff nurses of under five children pre-test mean was 15.33, standard deviation was 3.61, median was 16 and the range was 8-24. practice score of control group of staff nurses regarding iv cannulation post-test mean was 15.8, standard deviation was 3.51, median was 16 and the range was 9-24.

Table 4: *Range, Mean, Median and SD score of practice score of staff nurses*

N=30

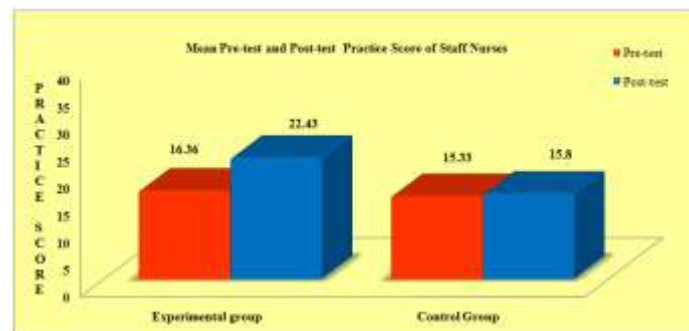|	Practice Score	Range	Mean	Median	SD
Experimental Group	Pre-test	9-22	16.36	16	2.82
	Post-test	15-28	22.43	23	2.76
Control Group	Pre-test	8-24	15.33	16	3.61
	Post test	9-24	15.80	16	3.51

Fig.2- Bar Graph Showing the Mean Pre-Test and Mean Post-Test Practice Score obtained by Staff nurses

The data presented in table 5 reveals that the mean post-test practice score of staff nurses regarding intravenous cannulation was 15.80 and the mean pre-test practice score was 15.33 with the mean difference of 0.47. The calculated 't' of 0.04 was found statistically no significant at 0.05 level which represents that the mean difference between pre-test and post-test knowledge score was true difference and not by chance. The data further reveals that the mean post-test practice score of staff nurses regarding concepts of intravenous cannulation was 22.43 and the mean pre-test practice score was 16.36 with the mean difference of 6.07. The calculated 't' of 8.43 was found statistically no significant at 0.05 level which represents that the mean difference between pre-test and post-test knowledge score was true difference and not by chance. Therefore null hypothesis H_{01} was rejected and research hypothesis H_1 was accepted.

Table 5: *Mean, Mean Difference and Standard Error of Mean Difference and 't' of Pre-test and Post-test practice Score of staff nurses.*

N=30

	Practice score	Mean	M_D	SD_D	SE_{MD}	't'
Experimental group	Pre-Test	16.36	6.07	0.06	0.72	8.43*
	Post-Test	22.43				
Control group	Pre-Test	15.33	0.47	0.1	0.84	0.04[N/S]
	Post-Test	15.80				

't' (29) = 2.05, *Significant (p ≤0.05)

The data presented in table 6 reveals that the mean post-test experimental group practice score of staff nurses regarding concepts of intravenous cannulation was 22.4 and the mean post-test control group practice score was 15.8 with the mean difference of 7.4. The calculated 't' of 8.28 was found statistically no significant at 0.05 level which represents that the mean difference between pre-test and post-test knowledge score was true difference and not by chance. Therefore null hypothesis H_{02} was rejected and research hypothesis H_2 was accepted.

Table 6: *Mean, Mean Difference and Standard Error of Mean Difference and 't' of Post-test Practice Score of experimental and control group of Staff nurses.*

N=30

Practice score	Mean	M_D	SD_D	SE_{MD}	't'
EXPERIMENTAL GROUP: Post-Test	22.40	7.4	0.75	0.81	8.28*
CONTROL GROUP: Post-Test	15.80				

't' (58) = 2.00, *Significant (p ≤0.05)

The data presented in table 7 reveals that the co-efficient of correlation between post-test knowledge score and post-test practice score of experimental and control group is –o.17 and 0.07 respectively, suggesting a no significant correlation between post-test knowledge score and post-test practice score. Therefore null hypothesis H_{03} was accepted and research hypothesis H_3 was rejected.

Table 7: *Correlation Between Post–test Knowledge Score and Post–test Practice Score of staff nurses*

N=30

TEST	KNOWLEDGE SCORE		PRACTICE SCORE		r
	Mean	SD	Mean	SD	
Experimental group	23.4	5.51	22.43	2.82	-0.17[N/S]
Control group	19.66	5.32	15.8	3.51	0.07[N/S]

r(28) = 0.3061   *Significant (p $\leq$0.05)

Implications
The findings of the study have implications in the field of nursing practice, nursing education and nursing administration.
Implications in Nursing Practice
As India is a developing country with limited resources and high neonatal mortality rate, the increase in knowledge and practice will help the staff nurses to provide effective care and better intravenous cannula insertion thereby reducing the no. of attempts to insert intravenous cannula and chances of transmission of infection. Efforts should be made to sensitize and educate all levels of staff dealing with children.

Implications in Nursing Education
Today's students are the future nurses who will be working at bed side. Though intravenous cannulation is there as a topic in the curriculum still the staff nurses don't have sufficient knowledge and practice regarding it. So, the teachers should emphasize on this topic. Use of interactive teaching methods such as demonstration, documentary, role play, use of audio-visual tapes, slide shows etc. add an important dimension to the presentation thereby increasing the understanding and retention level and help the learner to use their visual capacity.

Implications in Nursing Administration
Today, there is an increasing demand for quality of care. Nurse administrators are in a key position to prepare policies, its execution and evaluation to provide quality care. The nurse administrator should make collaborative efforts with neonatologists and staff nurses working in the paediatric and allied units to develop nursing practice standards, protocols and manuals for planning and incorporation of video-teaching programme in high –tech paediatric and allied units to teach staff nurses regarding intravenous cannulation of under five children.

V.   Conclusion
The following conclusions are drawn from the study:
❑ The staff nurses working in paediatric and allied units had significant gain in knowledge and improvement in practice after the administration of video-teaching programme regarding the intravenous cannulation for under five children.
❑ There was no significant correlation of the knowledge and practices of staff nurses in the post-test.
Thus, the video-teaching programme regarding intravenous cannulation for under five children was effective in enhancing the knowledge and improving the practice of staff nurses. The increase in knowledge and practice will help the staff nurses to carry out intravenous cannulation effectively thereby reducing the no. of attempts to insert intravenous cannula and chances of transmission of infection.

VI.   Recommendations
▪ A true experimental study can be replicated on a larger sample of staff nurses from selected hospitals of Punjab for wider generalization of the findings.
▪ A study on development of the standardized tools to assess the knowledge and practice of staff nurses regarding intravenous cannulation for under five children.
▪ A study can be undertaken to assess the impact of reinforced teaching on knowledge and practice of staff nurses regarding intravenous cannulation for under five children.
▪ A study can be carried out by using other teaching strategies like information booklet, SIM, manual, computer assisted instruction, or competency based teaching.

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