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"Effectiveness of Self-Designed Instructional Module (SIM) on Knowledge and Practice Regarding Modified Protocol-Based Insertion of IV-Line Cannula Among Nurses in Western UP."

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ABSTRACT

Background of the study: *Clinical practice is where intravenous (IV-line) cannulation is most commonly utilized. The process is intrusive. The most often performed procedure in a hospital or community setting is peripheral IV-line cannulation. According to reports, the complication rates of contemporary catheter-style devices range from 0% to 78%. Over the past few years, the incidence has stayed largely unchanged. 95% of IV-line cannulas are removed due to the following primary contraindications: infiltration, thrombophlebitis, catheter embolism, bleeding, tendon or ligament damage, sepsis, leaking, and occlusion.*

Aim: *The study aims to assess the effectiveness of Self-Instructional Modules (SIMs) in enhancing nurses' knowledge and adherence to protocol-based practices for IV-line cannula insertion. It seeks to identify existing gaps and improve patient care by promoting standardized, evidence-based nursing practices.*

OBJECTIVE:

1. To assess the pre-test and post-test level of knowledge regarding protocol-based insertion of IV-line cannula among nurses in the experimental group and control group.
2. To assess the pre-test and post-test level of practice regarding protocol-based insertion of IV-line cannula among nurses in the experimental group and control group.
3. To evaluate the effectiveness of the Self-Instructional Module on knowledge and practice regarding protocol-based insertion of IV-line cannula among nurses in the experimental group.
4. To find the relationship between the level of knowledge and practice regarding protocol-based insertion of IV-line cannula among nurses.
5. To find the association between the post-test level of knowledge and practice regarding protocol-based insertion of IV-line cannula among nurses and their selected demographic variables.

HYPOTHESIS

H_1- There is a significant difference between the mean pre-test and post-test scores on knowledge regarding protocol-based insertion of IV-line cannula among staff nurses in the experimental and control groups.
H_2- There is a significant difference between the mean pre-test and post-test scores on practice regarding protocol-based insertion of IV-line cannula among staff nurses in the experimental and control groups.
H_3- There is a significant correlation between the level of knowledge and practice regarding protocol-based insertion of IV-line cannula in the experimental and control groups.
H_4- There is a significant association between the post-test level of knowledge among the staff nurses regarding protocol-based insertion of IV-line cannula and their selected demographic variables.
H_5- There is a significant association between the post-test level of practice among the staff nurses regarding protocol-based insertion of IV-line cannula and their selected demographic variables.

MATERIAL AND METHODOLOGY

A quasi experimental research approach was used to carry out the study. The population comprised of registered staff nurses who working in selected Hospital, Meerut UP. The sample size was 60 (30 in experimental and 30 in control group).

Non probability purposive sampling technique was used for the sample of study. The tools used for study were a questionnaire for knowledge and checklist were used for the practice. It consists of different sections:

Section I: Data on demographic variables of staff nurses

Section II: Data on knowledge regarding modified protocol-based insertion of IV-line cannula among nurses

Section III: Data on practice regarding modified protocol-based insertion of IV-line cannula among nurses

Section IV: Data on the effectiveness of SIM on knowledge and practice regarding modified protocol-based insertion of IV-line cannula among nurses

Section V: Data on the relationship between knowledge and practice regarding modified protocol-based insertion of IV-Line cannula among nurses

Section VI: Data on the association between knowledge and practice of staff nurses with their selected demographic variables.

Section I: Data on demographic variables of staff nurses

Table 1: Frequency and Percentage distribution of demographic variables of staff nurses in the Experimental Group and Control Group. N=60 (Experimental group=30 & control group=30)

S. No	Demographic variables	Experimental group		Control group	
		(f)	f (%)	(f)	f (%)
1	**Age in years**				
	20-30	19	63.33%	13	43.3%
	31-40	8	26.67%	15	50.0%
	41-50	2	6.67%	02	6.7%
	Above 50	1	3.33%	0	0.0%
2	**Gender**				
	Male	10	33.33%	13	43.3%
	Female	20	66.67%	17	56.7%
	Transgender	0	0%	00	0.0%
3	**Marital status**				
	Married	15	50%	21	70.0%
	Unmarried	15	50%	09	30.0%
	Divorce/ widow/ separated	0	0%	00	0.0%
4	**Education status**				
	GNM	11	36.67%	21	70.0%
	B.Sc. Nursing	7	23.33%	04	13.3%
	Post B.Sc. Nursing	7	23.33%	05	16.7%
	M. Sc. Nursing	5	16.67%	00	0.0%
5	**Duration of working experience**				
	<1 year	4	13.33%	04	13.3%
	1-5 years	22	73.33%	11	36.7%
	6-10 years	3	10%	13	43.3%
	Above 10 years	1	3.33%	02	6.7%
6	**Area of working**				
	ICU	23	76.67%	08	26.7%
	Emergency	3	10%	02	6.7%
	Surgical ward	4	13.33%	16	53.3%
	General word	0	0%	04	13.3%
7	**Number of patients attended per day**				
	1-10	13	43.33%	7	23.3%
	11-20	10	33.33%	2	6.7%
	21-30	3	10%	6	20.0%

	Above 30	4	13.33%	15	23.3%
8	**Frequency of IV-line insertion**				
	Daily	27	90%	26	86.7%
	Weekly	2	6.7%	2	6.7%
	Occasionally	1	3.33%	2	6.7%
9	**Experience with complications**				
	Infection	7	23.33%	6	20.0%
	Phlebitis	5	16.67%	2	6.7%
	Infiltration	3	10%	3	10.0%
	All of the above	15	50%	19	63.3%

Section II: Data on knowledge regarding modified protocol-based insertion of iv-line cannula among nurses

Table 2: Frequency and percentage distribution on knowledge regarding modified protocol-based insertion of IV-line cannula among nurses in the experimental group
N=30

S.No	Level of Knowledge	Scoring	Pretest		Post test	
			f	f%	f	f%
1	Poor	0-9	3	10%	0	0%
2	Adequate	10-25	27	90%	6	20%
3	Excellent	26-35	0	0%	24	80%

The experimental group's knowledge Prior to the intervention, 27 (90%) of the participants showed that they knew enough about the protocol-based insertion of IV-line cannulas. None of the participants had excellent knowledge, and only three (10%) had poor knowledge. There was a discernible improvement following the intervention (post-test). Six participants (20%) showed adequate knowledge, while the majority of 24 participants (80%) attained excellent knowledge. Interestingly, the post-test did not classify any of the participants as having inadequate knowledge.

Table 3: Frequency and percentage distribution on knowledge regarding modified protocol-based insertion of IV-line cannula among nurses in the control group.
N=30

S.No	Level of Knowledge	Scoring	Pretest		Post test	
			f	f%	f	f%
1	Poor	0-9	6	17.14%	3	8.57%
2	Adequate	10-25	24	68.57%	27	77.14%
3	Excellent	26-35	0	0%	0	0%

The knowledge level of participants in the control group before and after the intervention is depicted in the above graph.
Six participants (17.14%) showed inadequate knowledge on the pre-test, whereas the majority of 24 participants (68.57%) showed adequate knowledge. Regarding the protocol-based insertion of IV-line cannulas, none of the participants demonstrated exceptional knowledge. There was a minor improvement in the post-test. Of the participants, 27 (77.14%) demonstrated adequate knowledge, while only 3 (8.57%) had poor knowledge. As with the pre-test, none of the participants scored exceptionally well on the post-test

Section III: Data on practice regarding modified protocol-based insertion of iv-line cannula among nurses

Table 4: Frequency and percentage distribution on practice regarding modified protocol-based insertion of IV-line cannula among nurses in the experimental group
N=30

S.No.	Level of Practice	Scoring	Pretest		Post test	
			f	f%	f	f%
1	Poor	0-6	5	16.67%	0	0%
2	Adequate	7-15	25	83.33%	7	23.33%
3	Excellent	16-24	0	0%	23	76.67%

Before intervention: The majority of participants, 25, (83.33%), had adequate practice prior to the intervention, while 5 participants (16.67%) showed poor practice. It was discovered that none of the participants had very good practice.
After intervention: 7 participants (2.33%) showed adequate practice following the intervention. Of the 23 participants, the majority (76.67%) demonstrated excellent practice. In terms of the experimental group's protocol-based IV-line cannula insertion, none of the participants continued to use subpar technique.

Table 5: Frequency and percentage distribution on practice regarding modified protocol-based insertion of IV-line cannula among nurses in the control group
N=30

S.No.	Level of Practice	Scoring	Pretest		Post test	
			f	f%	f	f%
1	Poor	0-6	4	13.33%	3	10%
2	Adequate	7-15	26	86.67%	27	90%
3	Excellent	16-24	0	0%	0	0%

Before intervention: Regarding the protocol-based insertion of IV-line cannulas, 4 participants (13.33%) demonstrated poor practice prior to the intervention, 26 participants (86.67%) had adequate practice, and none had excellent practice.
After intervention: Following the intervention, 3 participants (10%) showed poor practice, 27 participants (90%) showed adequate practice, and none of the control group had excellent practice with regard to the protocol-based insertion of an IV-line cannula.
Section IV: Data on the effectiveness of SIM on knowledge and practice regarding modified protocol-based insertion of iv-line cannula among nurses

Table 6: Mean, Standard Deviation, Mean Deviation, and 't' value of knowledge regarding Modified Protocol-Based Insertion of IV-line cannula Among Nurses
N=30

S. No.	Group	Knowledge				
		Mean	SD	MD	df	't' value
1	Experimental group	14.80	4.11	14.9	29	16.72
		29.70	5.66			
2	Control group	12.50	4.64	1.67		2.03
		14.17	4.39			

In the experimental group, knowledge scores improved significantly from the pre-test (M=14.80, SD=4.11) to the post-test (M=29.70, SD=5.66). The mean difference (MD) was 14.9 (t=16.72, p=2.11).
In the control group, scores also increased from the pre-test (M=12.50, SD=4.64) to the post-test (M=14.17, SD=4.39). The MD was 1.67 (t=2.03, p=4.30).

Table 7: Mean, Standard Deviation, Mean Difference, and 't' value of practice regarding Modified Protocol-Based Insertion of IV-line cannula Among Nurses
N=30

S. No.	Group	Practice				
		Mean	SD	MD	df	't' value
1	Experimental group	9.67	2.47	9.46	29	17.02
		19.13	3.62			
2	Control	9.7	1.91	1.1		3.01

	group	10.80	2.09			

Practice Score Comparison: The experimental group's practice scores increased significantly from the pre-test (M=9.67, SD=2.47) to the post-test (M=19.13, SD=3.62), with a mean difference (MD) of 9.46 (t=17.02, p=2.11).
With an MD of 1.1 (t=3.01, p=3.18), the control group's scores increased from the pre-test (M=9.7, SD=1.91) to the post-test (M=10.80, SD=2.09).
Section V: Data on the relationship between knowledge and practice regarding modified protocol-based insertion of IV-Line cannula among nurses

Table 8: To find the correlation coefficient between the knowledge and practice Regarding Modified Protocol-Based Insertion of IV-Line Cannula among Nurses
N=30

Variables	**Max. score**	**Pre-test**			**Post- test**		
		Mean	**Mean%**	**SD**	**Mean**	**Mean%**	**SD**
Knowledge	35	14.80	49.33	4.11	29.70	99%	5.66
Practice	24	9.67	32.23	2.47	19.13	63.76	3.62
Correlation coefficient (r)		**0.30**			**0.51**		

Table 8 Correlation Between Knowledge and Practice: The pre-test revealed a weak positive correlation (r=0.30) with regard to nurses' modified protocol-based IV-line cannula insertion, whereas the post-test revealed a strong positive correlation (r=0.51). However, at the $p<0.05$ significance level, the research hypothesis (H3) was rejected.

Section VI: Data on the association between knowledge and practice of staff nurses with their selected demographic variables.

Table 9: Frequency, 'p' value, Percentage distribution, and χ^2 value (Chi Square) of Knowledge regarding Modified Protocol-Based Insertion of IV-line cannula Among Nurses in Experimental Group (post-test)
N=30

S.No	**Demographic variable**	**Knowledge regarding protocol-based insertion of IV-line cannula Experimental Group**			**f**	**f%**	**df**	**'p' value**	**x^2 value**
		Poor	**Adequate**	**Excellent**					
1	**Age**								
	20-30	0	6	13	19	63.33%	3	7.82	4.34
	31-40	0	0	8	8	26.67%			
	41-50	0	0	2	2	6.67%			
	Above 50	0	0	1	1	3.33%			
2	**Gender**								
	Male	0	4	6	10	33.33%	2	5.99	2.34
	Female	0	3	17	20	66.67%			
	Transgender	0	0	0	0	0%			
3	**Marital status**								
	Married	0	6	9	15	50%	2	5.99	4.66
	Unmarried	0	1	14	15	50%			
	Divorce/ widow/ separated	0	0	0	0	0%			
4	**Education status**								
	GNM	0	5	6	11	36.67%	3	7.82	7.60
	B.Sc. Nursing	0	0	7	7	23.33%			

	Post B.Sc. Nursing	0	1	6	7	23.33%			
	M. Sc. Nursing	0	0	5	5	16.67%			
5	**Duration of working experience**								
	<1 year	0	2	2	4	13.33%	3	7.82	6.96
	1-5 years	0	4	18	22	73.33%			
	6-10 years	0	0	3	3	10%			
	Above 10 years	0	1	0	1	3.33%			
6	**Area of working**								
	ICU	0	6	17	23	76.67%	3	7.82	1.02
	Emergency	0	0	3	3	10%			
	Surgical ward	0	1	3	4	13.33%			
	General word	0	0	0	0	0%			
7	**Number of patients attended per day**								
	1-10	0	2	11	13	43.33%	3	12.59	3.67
	11-20	0	2	8	10	33.33%			
	21-30	0	2	1	3	10%			
	Above 30	0	1	3	4	13.33%			
8	**Frequency of IV-line insertion**								
	Daily	0	6	21	27	90%	2	5.99	1.10
	Weekly	0	1	1	2	6.7%			
	Occasionally	0	0	1	1	3.33%			
9	**Experience with complications**								
	Infection	0	5	2	7	23.33%	3	7.82	15.24
	Phlebitis	0	0	5	5	16.67%			
	Infiltration	0	0	3	3	10%			
	All of the above	0	1	14	15	50%			

Significant at <0.05 level,
Not significant at >0.05 level

According to the information above, Table No. 9 revealed that, at the 0.05 level of significance, there was no association between the nurses' knowledge of IV-line cannula insertion and specific demographic variables, including age, gender, marital status, educational attainment, length of employment, experience in the field, number of patients seen each day, frequency of IV-line insertion, and experience with complications.
Consequently, in which suggested that there would be no meaningful association between the chosen demographic variables and post-test level of knowledge. Thus, at the $p<0.05$ level of significance, the research hypothesis (H_4) was rejected.

Table 10: Frequency, 'p' value, Percentage distribution, and x^2 value of Knowledge regarding Modified Protocol-Based Insertion of IV-line cannula Among Nurses in the Control Group (Post-Test)
N=30

S.No	Demographic variable	Knowledge regarding protocol-based insertion of IV-line cannula in Control Group			f	f%	df	'p' value	x^2 value
		Poor	Adequate	Excellent					
1	**Age**								
	20-30	1	12	0	13	43.3%	3	7.82	0.48

	31-40	2	13	0	15	50.0%			
	41-50	0	2	0	02	6.7%			
	Above 50	0	0	0	0	0.0%			
2	**Gender**								
	Male	1	12	0	13	43.3%	1	3.84	0.13
	Female	2	15	0	17	56.7%			
	Transgender	0	0	0	00	0.0%			
3	**Marital status**								
	Married	0	21	0	21	70.0%	1	3.84	0
	Unmarried	0	9	0	09	30.0%			
	Divorce/ widow/ separated	0	0	0	00	0.0%			
4	**Education status**								
	GNM	2	19	0	21	70.0%	2	5.99	0.93
	B.Sc. Nursing	1	3	0	04	13.3%			
	Post B.Sc. Nursing	1	4	0	05	16.7%			
	M. Sc. Nursing	0	0	0	00	0.0%			
5	**Duration of working experience**								
	<1 year	0	4	0	04	13.3%	3	7.82	1.09
	1-5 years	1	10	0	11	36.7%			
	6-10 years	2	11	0	13	43.3%			
	Above 10 years	0	2	0	02	6.7%			
6	**Area of working**								
	ICU	1	7	0	08	26.7%	3	7.82	0.83
	Emergency	0	2	0	02	6.7%			
	Surgical ward	2	14	0	16	53.3%			
	General word	0	4	0	04	13.3%			
7	**Number of patients attended per day**								
	1-10	1	6	0	7	23.3%	3	7.82	4.55
	11-20	1	1	0	2	6.7%			
	21-30	0	6	0	6	20.0%			
	Above 30	1	14	0	15	50.0%			
8	**Frequency of IV-line insertion**								
	Daily	3	23	0	26	86.7%	2	5.99	0.51
	Weekly	0	2	0	2	6.7%			
	Occasionally	0	2	0	2	6.7%			
9	**Experience with complications**								
	Infection	1	5	0	6	20%	3	7.82	0.85
	Phlebitis	0	2	0	2	6.7%			
	Infiltration	0	3	0	3	10%			
	All of the above	2	17	0	19	63.3%			

Significant at <0.05 level,
Not significant at >0.05 level

Nurses' pre-test knowledge of IV-line cannula insertion did not significantly correlate with certain demographic factors, including age, gender, educational attainment, length of employment, experience area, number of patients seen daily, frequency of IV-line insertion, and experience with complications, at the 0.05 level of significance. Nonetheless, a noteworthy correlation was discovered between the demographic variable "marital status" and the post-test knowledge of nurses. Consequently, the null hypothesis (H4), which claimed that there was no meaningful correlation between pre-test knowledge and particular demographics, was rejected.

Table 11: Frequency, 'p' value, Percentage distribution, and χ^2value of Practice regarding Modified Protocol-Based Insertion of IV-line cannula Among Nurses Experimental Group (Post- Test) N=30

S.No.	Demographic variable	Practice regarding protocol-based insertion of IV-line cannula Experimental Group			f	f%	df	'p' value	x^2 value
		Poor	Adequate	Excellent					
1	**Age**								
	20-30	0	6	13	19	63.33%	3	7.82	4.47
	31-40	0	1	7	8	26.67%			
	41-50	0	0	2	2	6.67%			
	Above 50	0	1	0	1	3.33%			
2	**Gender**								
	Male	0	2	8	10	33.33%	1	3.84	0.34
	Female	0	6	14	20	66.67%			
	Transgender	0	0	0	0	0%			
3	**Marital status**								
	Married	0	4	11	15	50%	1	3.84	0
	Unmarried	0	4	11	15	50%			
	Divorce/widow/ separated	0	0	0	0	0			
4	**Education status**								
	GNM	0	6	5	11	36.67%	3	7.82	4.59
	B.Sc. Nursing	0	1	6	7	23.33%			
	Post B.Sc. Nursing	0	1	6	7	23.33%			
	M. Sc. Nursing	0	2	3	5	16.67%			
5	**Duration of working experience**								
	<1 year	0	1	3	4	13.33%	3	7.82	3.80
	1-5 years	0	6	16	22	73.33%			
	6-10 years	0	0	3	3	10%			
	Above 10 years	0	1	0	1	3.33%			
6	**Area of working**								
	ICU	0	6	17	23	76.67%	2	5.99	0.08
	Emergency	0	1	2	3	10%			
	Surgical ward	0	1	3	4	13.33%			
	General word	0	0	0	0	0%			
7	**Number of patients attended per day**								
	1-10	0	5	8	13	43.33%	3	7.82	2.68
	11-20	0	2	8	10	33.33%			
	21-30	0	1	2	3	10%			
	Above 30	0	0	4	4	13.33%			
8	**Frequency of IV-line insertion**								
	Daily	0	7	20	27	90%	2	5.99	1.01
	Weekly	0	0	2	2	6.7%			
	Occasionally	0	0	1	1	3.33%			

9	**Experience with complications**								
	Infection	0	2	5	7	23.33%	3	7.82	4.28
	Phlebitis	0	0	5	5	16.67%			
	Infiltration	0	0	3	3	10%			
	All of the above	0	6	9	15	50%			

Significant at <0.05 level,
Not significant at >0.05 level

Selected demographic variables in the control group did not significantly correlate with nurses' IV-line cannula insertion practices at the 0.05 level of significance. Nonetheless, a noteworthy correlation was discovered between post-test practice and the demographic variable known as "marital status." Consequently, the null hypothesis (H5), which claimed that there was no meaningful correlation between post-test practice and particular demographic factors, was disproved.

Table 12: Frequency, 'p' value, Percentage distribution, and x^2 value of Practice regarding Modified Protocol-Based Insertion of IV-line cannula Among Nurses in Control Group (Post- Test)
N=30

S. No.	Demographic variable	Practice regarding protocol-based insertion of IV-line cannula Control Group			f	f%	df	'p' value	x^2 value
		Poor	Adequate	Excellent					
1	**Age**								
	20-30	0	13	0	13	43.3%	2	5.99	0.0
	31-40	0	15	0	15	50%			
	41-50	0	02	0	02	6.7%			
	Above 50	0	0	0	0	0.0%			
2	**Gender**								
	Male	0	13	0	13	43.3%	1	3.84	0.0
	Female	0	17	0	17	56.7%			
	Transgender	0	00	0	00	0.0%			
3	**Marital status**								
	Married	0	21	0	21	70.0%	1	3.84	0.0
	Unmarried	0	09	0	09	30.0%			
	Divorce/widow/ separated	0	00	0	00	0.0%			
4	**Education status**								
	GNM	0	21	0	21	70%	2	5.99	0.0
	B.Sc. Nursing	0	04	0	04	13.3%			
	Post B.Sc. Nursing	0	05	0	05	16.7%			
	M. Sc. Nursing	0	00	0	00	0.0%			
5	**Duration of working experience**								
	<1 year	0	04	0	04	13.3%	3	7.82	0.0
	1-5 years	0	11	0	11	36.7%			
	6-10 years	0	13	0	13	43.3%			
	Above 10 years	0	02	0	02	6.7%			
6	**Area of working**								
	ICU	0	08	0	08	26.7%	3	7.82	0.0
	Emergency	0	02	0	02	6.7%			

	Surgical ward	0	16	0	16	53.3%			
	General word	0	04	0	04	13.3%			
7	**Number of patients attended per day**								
	1-10	0	7	0	7	23.3%	3	7.82	0.0
	11-20	0	2	0	2	6.7%			
	21-30	0	6	0	6	20%			
	Above 30	0	15	0	15	50%			
8	**Frequency of IV-line insertion**								
	Daily	0	26	0	26	86.7%	2	5.99	0.0
	Weekly	0	2	0	2	6.7%			
	Occasionally	0	2	0	2	6.7%			
9	**Experience with complications**								
	Infection	0	6	0	6	20%	3	7.82	0.0
	Phlebitis	0	2	0	2	6.7%			
	Infiltration	0	3	0	3	10%			
	All of the above	0	19	0	19	63.3%			

The information in Table No.12, which is displayed above, indicated that there was an association between the nurses' practices regarding IV-line cannula insertion and a few demographic variables, including age, gender, marital status, educational attainment, length of employment, experience in the field, number of patients seen each day, frequency of IV-line insertion, and experience with complications in the control group, at the 0.05 level of significance.
Consequently, in which that "there is significant association between post-test levels of practice and their selected demographic variable, such as age, gender, and marital status, educational background, length of employment, experience in the field, number of patients seen daily, frequency of IV line insertion, and experience with complications. ." (H_5) was **accepted.**

DISCUSSION

The findings of the present study discussed with other related studies and organized under the following discussion.
Description of demographic data of the sample

Regarding demographic variable of staff nurses, total number of staff nurses are 60.

- **Regarding Age Distribution:** Experimental group: Majority (63.33%) aged 20 to 30 years. Control group: Majority (50%) aged 31 to 40 years.
- **Regarding Gender:** Experimental group: 66.67% female, 33.33% male. Control group: 56.7% female, 43.3% male.
- **Regarding Marital Status** Experimental group: 50% married, 50% single. Control group: 70% married, 30% single.
- **Regarding Educational Status:** Experimental group: GNM – 36.67%, B.Sc. Nursing – 23.33%, Post B.Sc. Nursing – 23.33%, M.Sc. Nursing – 16.67%.Control group: GNM – 70%, B.Sc. Nursing – 13.3%, Post B.Sc. Nursing – 16.7%, M.Sc. Nursing – 0%.
- **Regarding Work Experience:** Experimental group: 1 to 5 years – 73.33%, less than 1 year – 13.33%, 6 to 10 years – 10%, 10 years – 3.33%. Control group: 6 to 10 years – 43.3%, 1 to 5 years – 36.7%, less than 1 year – 13.3%, 10 years – 6.7%.
- **Regarding Work Area:** Experimental group: ICU – 76.67%, Surgical ward – 13.33%, Emergency – 10%. Control group: Surgical ward – 53.3%, ICU – 26.7%, General ward – 13.3%, Emergency – 6.7%.
- **Regarding Patients Attended Daily**: Experimental group: 1 to 10 patients – 43.33%, 11 to 20 – 33.33%, and 21 to 30 – 10%, more than 30 – 13.33%. Control group: more than 30 – 50%, 21 to 30 – 20%, 1 to 10 – 23.3%, 11 to 20 – 6.7%.
- **Regarding Frequency of IV-Line Insertion**: Experimental group: Daily – 90%, Weekly – 6.7%, Occasionally – 3.33%. Control group: Daily – 86.7%, Weekly – 6.7%, Occasionally – 6.7%.

- **Regarding Experience with Complications**: Experimental group: Infection, phlebitis, and infiltration – 50%, Infection only – 23.33%, Phlebitis – 16.67%, Infiltration – 10%. Control group: Infection, phlebitis, and infiltration – 63.3%, Infection only – 20%, Phlebitis – 6.7%, Infiltration – 10%.

Assess the knowledge regarding modified protocol-based insertion of IV-line cannula among nurses in experimental group

The experimental group's knowledge prior to the intervention, 27 (90%) participants shows that adequate knowledge. None of the participants had excellent knowledge, and 3 (10%) had poor knowledge. After intervention (post-test). 6 participants (20%) adequate knowledge, 24 participants (80%) attained excellent knowledge. Interestingly, the post-test did not classify any of the participants as having inadequate knowledge.

Assess the knowledge regarding modified protocol-based insertion of IV-line cannula among nurses in control group

Knowledge Levels on Protocol-Based IV-Line Cannula Insertion:

Pre-test: Poor knowledge: 6 participants (17.14%), Adequate knowledge: 24 participants (68.57%), Excellent knowledge: 0 participants (0%)

Post-test: Poor knowledge: 3 participants (8.57%), Adequate knowledge: 27 participants (77.14%), Excellent knowledge: 0 participants (0%).

Assess the practice regarding modified protocol-based insertion of IV-line cannula among nurses in experimental group

Before the intervention, 83.33% (25) of participants had adequate practice, 16.67% (5) had poor practice, and none showed very good practice. After the intervention, only 7 participants (23.33%) stayed at an adequate level, while 76.67% (23) improved to excellent practice. No participants continued with poor practice.

Assess the practice regarding modified protocol-based insertion of IV-line cannula among nurses in control group

Before the intervention, 13.33% (4) showed poor practice, 86.67% (26) had adequate practice, and none demonstrated excellent practice. After the intervention in the control group, 10% (3) had poor practice, while 90% (27) maintained adequate practice, with no participants achieving excellent practice.

Finding the association between level of knowledge and practice of staff nurses with their demographic variables.

The finding that standard deviation is revels that correlation coefficient between the knowledge and practice Regarding Modified Protocol-Based Insertion of IV-Line Cannula among Nurses

Chi square test used to find out the association between the level of knowledge and practice of staff nurses with their demographic variables.

The result of our study shows that the staff nurse's knowledge 6 participants (20%) adequate knowledge, 24 participants (80%) attained excellent knowledge. Interestingly, the post-test did not classify any of the participants as having inadequate knowledge and practice only 7 participants (23.33%) stayed at an adequate level, while 76.67% (23) improved to excellent practice. No participants continued with poor practice.

CONCLUSION

Following the intervention, the experimental group's knowledge and practice scores significantly improved, as indicated by the unpaired t-test. The knowledge scores before and after the test showed a significant increase, with a mean difference (MD) of 14.9, a t-value of 16.72, and a p-value of 2.11. The practice scores also demonstrated a significant improvement, with a p-value of 2.11, a t-value of 17.02, and an MD of 9.46. These findings suggest that, whereas the control group showed minimal treatment, the intervention effectively increased participants' comprehension and practical skills. The experimental group's lower p-values, which demonstrate strong statistical significance, support the intervention's efficacy.

RECOMMENDATION

To increase generalizability, future research should employ a bigger, more varied sample from different hospital settings. The most successful strategy can be found by contrasting the Self-Designed Instructional Module (SIM) with alternative training techniques (such as workshops, e-learning, and simulation). Additionally, studies should evaluate how better nurse practices affect patient outcomes, like fewer IV-site infections. Adding qualitative methods like interviews or focus groups can offer deeper insights into nurses' experiences and training needs.

ETHICAL CLEARANCE: Prior permission was obtained by Principal, College of Nursing, LLRM Medical College, Meerut.

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