



Effectiveness of planned teaching program on knowledge and practice regarding Paediatric intravenous therapy among Staff Nurses in selected hospital at Bareilly U.P.

¹Khushboo, ^{2*}Dr Anitha P.

¹Second year M.Sc. Nursing Student, Rohilkhand College of Nursing, Bareilly-243006, U.P. India

^{2*}Professor, Department of Child Health Nursing, Rohilkhand College of Nursing, Bareilly-243006, U.P. India

Submission: June 3, 2026; Revised: June 23, 2026; Published: June 30, 2026

Corresponding author:

Dr Anitha P.

Professor, Department of Child Health Nursing, Rohilkhand College of Nursing, Bareilly-243006, U.P. India,

Email id: hiitsanitha@gmail.com

ABSTRACT

The intravenous route seems to be a best possible and the fastest way for delivering fluids or drugs. Even it carries most risk than other routes, so it is important to reduce the risk thus it is essential for the practitioners to exhibit their ability to practice safely. The study was aimed to assess the effectiveness of planned teaching program on knowledge and practice regarding paediatric intravenous therapy. A quantitative approach with pre-experimental; one group pre-test & post-test design was adopted for the study and purposive sampling technique was used to select 60 Staff Nurses of Rohilkhand Medical College & Hospitals, Bareilly, U.P. Self-structured questionnaire & structured checklist was administered with pen & paper method & observation method to collect the data. Pre-test sampling was conducted on the same day planned teaching program was given & after a period of 7 days Post-test was observed. The collected data was analysed by using SPSS version 22 (Descriptive & Inferential statistics were used mean, median, range, frequency, percentage, standard deviation, chi-square & paired 't' test). Analysis revealed that the mean of post-test was higher than mean of pre-test, paired 't' test value was found to be highly statistically significant at significance level of $p < 0.001$ for knowledge & practice. Chi-square revealed there is no association between pre-test knowledge & practice scores with their selected demographic variables. Through the result study concluded that after planned teaching program, the mean of post-test gets improved compared to pre-test. Hence, planned teaching program is effective in imparting the knowledge and improving practice regarding paediatric intravenous therapy.

Keywords: Assess; knowledge; practice; effectiveness; paediatric intravenous therapy; Staff Nurses.

INTRODUCTION

Intravenous (IV) therapy involves administering fluids or medications directly into a vein using a thin, flexible catheter connected to a tubing system and an infusion bag. Once secured, the IV should not cause pain. Computerized infusion pumps regulate the flow to ensure accurate dosage and timing for pediatric patients [1].

IV rehydration is routinely performed and generally safe, but complications may occur, including air embolism, collapsed veins, hematoma, infection, infiltration, and phlebitis[2]. Prompt identification and management of these issues are essential to prevent harm.

Nurses play a crucial role in IV administration, especially for hospitalized patients requiring prolonged treatment. Although IV therapy is the fastest and most effective route for delivering medications and fluids, it carries higher risks than other methods. Therefore, safe practice and strong clinical competency are vital. According to the CDC, approximately 1.7 million hospital-acquired infections and 99,000 related deaths occur annually in the U.S., many linked to IV cannula use. Prolonged cannula placement increases the risk of cellulitis, phlebitis, sepsis, and infections such as MRSA. Current U.S. guidelines recommend replacing IV cannulas every 96 hours to reduce these complications. The Infusion Nurses Society further emphasizes that nurses must be knowledgeable about adverse effects and appropriate interventions during IV drug and fluid administration [3].

Objectives

1. To assess the level of knowledge and practice regarding paediatric intravenous therapy among the staff Nurses.
2. To evaluate the effectiveness of planned teaching program on knowledge regarding paediatric intravenous therapy among the staff nurses.
3. To associate the pre- test knowledge and practice score regarding paediatric intravenous therapy with their selected socio-demographic variables among the staff nurses.

MATERIALS & METHODS

- Research Approach: Quantitative Approach
- Research Design: Pre-experimental (one group pre-test & post-test)
- Setting of the study: Rohilkhand Medical College & Hospital, Bareilly, UP
- Population: Staff Nurses
- Sample: Staff Nurses of Rohilkhand Medical College & Hospital, Bareilly UP
- Sampling technique: Purposive Sampling technique

Inclusion Criteria

- Staff nurses whose are available at the time of data collection.
- Staff nurses who gave consent.

Exclusion Criteria

- Staff nurses who are not willing to participate in this study.
- Staff nurses working in causality.

Tools and technique

After a wide review of literature, conversation with experts in the field of paediatrics and with the investigator's personal experience, Self-Structured Knowledge Questionnaire & Practice checklist on pediatric Intravenous therapy were the tool for data collection.

Section A: Demographic data consist of 6 items including Age, Gender, Professional Education, Area of working, Years of experience, Training program attended regarding paediatric intravenous therapy.

Section B: A self-structured knowledge questionnaire was prepared consisting of 20 questions related to assessing the knowledge of nursing staff regarding the pediatric intravenous therapy. The maximum obtained score is 20. A right answer was given a score of one and for wrong answer a score zero is allotted.

Section C: Structured Checklist to assess the practice of pediatric intravenous therapy. It contains 15 steps, each statement will be scored by yes/no and yes contain 1 point and no contain zero points.

Reliability of tool

Reliability is the degree of consistency and accuracy with which an instrument measures the attribute for which it is designed to measure. The reliability of the research tools was established by a split half method. The tool was administered for 10 samples, questions were divided into two equal halves by first half and second half selection and correlation coefficient of half test was found by using Karl Pearson correlation

coefficient formula. The reliability of the whole test was established by the Spearman Brown prophecy formula. The knowledge & practice score for pediatric intravenous therapy was used to establish reliability. The reliability of the tool was found to be $r = 0.98$ & $r1 = 1.00$. Hence, the tool was found to be reliable

Data Collection

Data collection was carried out after obtaining permission from the Medical Superintendent of the selected hospital in Bareilly. Using purposive sampling, 60 participants were selected. The investigator introduced herself, explained the study purpose, and obtained informed consent, assuring participants that they could withdraw at any time.

Data were collected using pen-and-paper and observation methods. Knowledge was assessed through a 15-minute pre-test using a self-structured questionnaire, while practice related to pediatric intravenous therapy was evaluated for 5 minutes using a structured checklist. Data collection took place from July 24 to July 26, 2024, between 2:00 pm and 4:00 pm. On the same day, a 45-minute planned teaching program was administered. After seven days, post-test knowledge and practice were reassessed using the same tools over a total duration of 20 minutes (15 minutes for knowledge and 5 minutes for practice).

RESULT

Section-A: Description of Demographic Variables of Staff Nurses.

Table 1: Description of sample characteristics in terms of frequency and percentage. N = 60

S. N.	Demographic Variable		Frequency (f)	Percentage (%)
1.	Age	21-25 years	23	38.3
		26-30 years	33	55
		31-35 years	4	6.7
		35 years or above	0	0
2.	Gender	Male	31	51.7
		Female	29	48.3
3.	Professional Education	B.Sc. Nursing or M.Sc. Nursing	11	18.3
		GNM	28	46.7
		ANM	21	35
4.	Area of Working	Pediatric ward	6	10
		PICU/NICU	20	33.3
		OPD	4	6.7
		Other	30	50
5.	Year of Experience	0 to 3	23	38.3
		3 to 6	33	55
		6 to 9	4	6.7
		9 or above	0	0
6.	Training program attended regarding	Yes	35	58.3

	pediatric IV therapy			
		No	25	41.7

Section-B: Comparison of Pre-Test and Post-Test Knowledge Score Regarding Paediatric Intravenous Therapy.

Table 2: Comparison of Pre-test and Post-test knowledge score regarding Paediatric Intravenous therapy. N = 60

Test	Mean	Standard Deviation (SD)	Mean Difference	Paired 't' test
Pre-test	9.65	2.962	-5.917	t = -14.293 at p<0.001*
Post-test	15.57	1.917		

t (59) =3.234, p<0.001 *Highly significant

The above-mentioned table 2 represents that the post-test mean $\pm$ SD 15.57 $\pm$ 1.917 is greater because they went through treatment (planned teaching program regarding paediatric intravenous therapy) than compared to pre-test mean $\pm$ SD 9.65 $\pm$ 2.962 with the mean difference of -5.917. The calculated paired 't' test is t = -14.293, which was found to be highly statistically significant at p<0.001.

With 95% confidence interval of the difference, at df 59 & in Sig (2-tailed) is 8.0278E-21. Therefore, the effectiveness of planned teaching program on knowledge regarding paediatric intravenous therapy is proven. **Research hypotheses (H1) is accepted.**

Section-C: Comparison of Pre-Test and Post-Test Practice Score Regarding Paediatric Intravenous Therapy

Table 3: Comparison of Pre-test and Post-test Practice score regarding Paediatric Intravenous therapy. N=60

Test	Mean	Standard Deviation (SD)	Mean Difference	Paired 't' test
Pre-test	6.70	1.465	-5.150	t = -20.963 at p<0.001*
Post-test	11.85	1.260		

t (59) =3.234, p<0.001 *Highly significant

The above mentioned table 3 represents that the post-test mean $\pm$ SD 11.85 $\pm$ 1.260 is greater because they went through treatment (planned teaching program regarding paediatric intravenous therapy) than compared to pre-test mean $\pm$ SD 6.70 $\pm$ 1.465. The calculated paired 't' test is t = -20.963, which was found to be highly statistically significant at p<0.001, with 95% confidence interval of the difference, at df 59 & in Sig (2-tailed) is 5.0262E-29. Therefore, the effectiveness of planned teaching program on practice regarding paediatric intravenous therapy is proven. **Research hypotheses (H1) is accepted.**

Section-D: Association of Pre-Test Knowledge and Practice Score Regarding Paediatric Intravenous Therapy with their Selected Demographic Variables

Table 4: Association of pre-test knowledge score of Staff Nurses regarding paediatric Intravenous therapy according to age, gender, professional education, area of working, years of experience & Training program attended regarding paediatric IV therapy. N=60

S. No.	Demographic Variable		Total Sample (n)	LEVEL OF KNOWLEDGE						Chi-square Table Value, df	Chi-square (p value)
				f	%	f	%	f	%		
1.	Age	21-25 years	23	2	3.3	16	27	5	8.3	9.488,4	2.493 (0.646)
		26-30 years	33	4	6.7	25	42	4	6.7		
		31-35 years	4	0	0.0	4	6.7	0	0		
		35 years or above	0	0	0.0	0	0	0	0		
2.	Gender	Male	31	2	3.3	23	38	6	10	5.991,2	1.624 (0.444)
		Female	29	4	6.7	22	37	3	5		
3.	Professional Education	B.Sc. Nursing or M.Sc. Nursing	11	1	1.7	8	13	2	3.3	9.488,4	0.131 (0.998)
		GNM	28	3	5.0	21	35	4	6.7		
		ANM	21	2	3.3	16	27	3	5		
4.	Area of Working	Paediatric ward	6	1	1.7	5	8.3	0	0	12.592,6	7.4333 (0.283)
		PICU/NICU	20	3	5.0	13	22	4	6.7		
		OPD	4	0	0.0	2	3.3	2	3.3		
		Other	30	2	3.3	25	42	3	5		
5.	Year of Experience	0-3	23	2	3.3	16	27	5	8.3	9.488,4	2.493 (0.646)
		6-Mar	33	4	6.7	25	42	4	6.7		
		9-Jun	4	0	0.0	4	6.7	0	0		
		9 or above	0	0	0.0	0	0	0	0		
6.	Training program attended	Yes	35	5	8.3	26	43	4	6.7	5.991,2	2.263 (0.323)
		No	25	1	1.7	19	32	5	8.3		

Table 4 mentioned above states, the Comparison of pre-test knowledge score of Staff Nurses regarding paediatric intravenous therapy according to age, gender, professional education, area of working, years of experience & training program attended regarding paediatric IV therapy, shows no significant association as the depicted in the table. **Therefore, research hypotheses (H2) is not accepted.**

Table 5: Association of pre-test practice score of Staff Nurses regarding paediatric Intravenous therapy according to age, gender, professional education, area of working, years of experience & Training program attended regarding paediatric IV therapy. N = 60

S. N.	Demographic Variable		Total Sample (n)	LEVEL OF PRACTICE						Chi-square Table Value, df	Chi-square (p value)
				Satisfactory		Moderately Satisfactory		Unsatisfactory			
				f	%	f	%	f	%		
1.	Age	21-25 years	23	0	0.0	18	30	5	8.33	5.991,2	0.520 (0.771)
		26-30 years	33	0	0.0	28	47	5	8.33		
		31-35 years	4	0	0.0	3	5	1	1.67		
		35 years or above	0	0	0.0	0	0	0	0		
2.	Gender	Male	31	0	0.0	24	40	7	11.7	3.841,1	0.773 (0.379)
		Female	29	0	0.0	25	42	4	6.67		
3.	Professional Education	B.Sc. Nursing or M.Sc. Nursing	11	0	0.0	9	15	2	3.33	5.991,2	2.556 (0.279)
		GNM	28	0	0.0	25	42	3	5		
		ANM	21	0	0.0	15	25	6	10		
4.	Area of Working	Paediatric ward	6	0	0.0	6	10	0	0	7.815,3	2.894 (0.408)
		PICU/NICU	20	0	0.0	15	25	5	8.33		
		OPD	4	0	0.0	4	6.7	0	0		
		Other	30	0	0.0	24	40	6	10		
5.	Year of Experience	0-3	23	0	0.0	18	30	5	8.33	5.991,2	0.520 (0.771)
		6-Mar	33	0	0.0	28	47	5	8.33		

		9-Jun	4	0	0.0	3	5	1	1.67		
		9 or above	0	0	0.0	0	0	0	0		
6.	Training program attended regarding paediatric IV therapy	Yes	35	0	0.0	29	48	6	10	3.841,1	0.080 (0.778)
		No	25	0	0.0	20	33	5	8.33		

Table 5 mentioned above states, the Comparison of pre-test practice score of Staff Nurses regarding paediatric intravenous therapy according to age, gender, professional education, area of working, years of experience & training program attended regarding paediatric IV therapy, shows no significant association as the depicted in the table. **Therefore, research hypotheses (H2) is not accepted.**

DISCUSSION

The study findings show a significant improvement in both knowledge and practice regarding pediatric intravenous therapy after the planned teaching program. The post-test knowledge mean score (15.57 ± 1.917) was higher than the pre-test score (9.65 ± 2.962), with a mean difference of - 5.917. The paired-t value ($t = -14.293$, $p < 0.001$) confirms a highly significant effect, supporting the research hypothesis (H1).

Similarly, the **post-test practice mean score (11.85 ± 1.260)** was greater than the **pre-test score (6.70 ± 1.465)**. The paired-t value ($t = -20.963$, $p < 0.001$) indicates strong statistical significance, further proving the effectiveness of the planned teaching program on practice levels.

These findings align with the study by **Anandhan Divya & Dhandapani Geetha (2023)**, who also reported marked improvements in knowledge (mean difference -8.77, $t = 26.7$) and practice (mean difference -4.43, $t = 8.215$). This consistency strengthens the evidence that structured teaching programs effectively enhance knowledge, improve standardized practice, and increase awareness regarding pediatric intravenous therapy [4].

Analysis of the association between pre-test knowledge and practice scores with selected demographic variables showed **no significant relationship**, leading to the rejection of research hypothesis (H2).

CONCLUSION

It was concluded that staff nurses at Rohilkhand Medical College & Hospital, Bareilly, U.P., initially demonstrated moderately adequate knowledge and moderately satisfactory practice regarding pediatric intravenous therapy. Following the planned teaching program, both knowledge and practice scores improved significantly in the post-test. Therefore, the intervention was effective in enhancing nurses' understanding and skills related to providing intravenous therapy to pediatric patients.

CONFLICT OF INTEREST

Authors declare for none conflict of interest.

REFERENCES

- [1]. Intravenous therapy [Internet]. Children's Minnesota. 2023; Available from: <https://www.childrensmn.org/educationmaterials/childrensmn/article/16057/intravenous-therapy>
- [2]. IV Fluids (Intravenous Fluids), medicine given, vein Cleveland Clinic. 2023; Available from: <https://my.clevelandclinic.org/health/treatments/21635-iv-fluids>
- [3]. Researchgate.net. 2023; Available from: https://www.researchgate.net/publication/359686594_
- [4]. Divya A, Vijayasamundeeswari P, Geetha D. Effectiveness of Planned Teaching Program on Knowledge and Practice Regarding Intravenous Therapy among Paediatric Nurses. Journal of Clinical & Diagnostic Research. 2021; 1: 15(9).