The Effectiveness of Planned Teaching Program on the Knowledge Regarding Visual Infusion Phlebitis (VIP) Score Among the Final Year Nursing Students of Selected Nursing Colleges: A Quasi-Experimental Study

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Abstract—Background: Visual infusion phlebitis (VIP) is a common complication of intravenous therapy that can affect patient outcomes. Adequate knowledge among nursing students is essential for early identification and prevention.

Objectives: To assess the effectiveness of a planned teaching program on the knowledge regarding VIP score among final-year nursing students.

Methods: A quasi-experimental design was adopted. Seventy final-year nursing students from selected colleges were selected through convenience sampling. A structured questionnaire assessed pre-test and post-test knowledge. The intervention consisted of a planned teaching program on VIP score. Data were analysed using descriptive statistics, paired t-test, and chi-square test for associations.

Results: Pre-test knowledge indicated that 56.56% of students had average knowledge, 33.78% had poor knowledge, and only 9.66% had good knowledge. Post-test results showed a significant improvement, with 96.67% achieving excellent knowledge. Paired t-test revealed a statistically significant difference between pre-test and post-test scores ($t = 37.85$, $p < 0.001$). Gender and previous knowledge were significantly associated with post-test scores ($p < 0.05$).

Conclusion: The planned teaching program was highly effective in improving knowledge regarding VIP score among final-year nursing students. Integrating such educational interventions into nursing curricula can enhance patient care outcomes.

Index Terms—Visual Infusion Phlebitis, VIP Score, Nursing Students, Planned Teaching Program, Quasi-Experimental Study

I. INTRODUCTION

Intravenous (IV) therapy is one of the most common and essential procedures in healthcare settings, widely used for administering medications, fluids, and blood products. However, IV therapy is not without complications, and one of the most frequent adverse events associated with IV therapy is phlebitis, an inflammation of the vein. Phlebitis can cause pain, redness, swelling, and discomfort for patients, and if left untreated, may lead to serious complications such as thrombophlebitis or infection.

Early detection and timely management of phlebitis are crucial to prevent complications. The Visual Infusion Phlebitis (VIP) Score is a standardized tool used to assess and monitor the severity of phlebitis. It provides a systematic approach for nurses to identify early signs of vein inflammation and take appropriate interventions, thereby improving patient safety and the quality of nursing care.

Nursing students, particularly those in their final year, are future healthcare providers who play a vital role in the administration and monitoring of IV therapy. Adequate knowledge regarding the VIP score is essential to ensure accurate assessment, early detection of phlebitis, and effective patient management. Studies have shown that gaps in knowledge among nursing students regarding phlebitis assessment may compromise patient care outcomes.

Planned teaching programs are structured educational interventions designed to enhance knowledge and skills in a targeted area. Such programs have been proven effective in improving knowledge, clinical

competence, and professional confidence among nursing students. Therefore, implementing a planned teaching program regarding the VIP score could empower final-year nursing students with the necessary knowledge to assess and manage IV therapy complications more effectively.

This study aims to evaluate the effectiveness of a planned teaching program on the knowledge regarding the Visual Infusion Phlebitis score among final-year nursing students in selected nursing colleges, thereby contributing to improved patient care practices and reducing IV-related complications.

Background of the Study: Intravenous (IV) therapy is an indispensable component of modern healthcare, widely employed for administering fluids, medications, and nutritional supplements. Despite its routine use, IV therapy is associated with several complications, among which phlebitis—inflammation of the vein—is one of the most common. Phlebitis can lead to pain, redness, swelling, and tenderness along the vein, and in severe cases, it may result in thrombophlebitis, infection, or compromised vascular access. Studies indicate that the incidence of phlebitis in hospitalized patients ranges from 2% to 67%, depending on various factors such as catheter material, insertion technique, duration of therapy, and patient-related conditions.

Early identification of phlebitis is critical for effective management and prevention of complications. The Visual Infusion Phlebitis (VIP) Score is a validated tool designed to assess the severity of phlebitis systematically. It grades the condition from 0 (no signs of phlebitis) to 5 (severe phlebitis), guiding nurses in timely interventions such as catheter removal, site rotation, or medical referral. Despite its importance, studies have shown that nursing students and even practicing nurses often have limited knowledge and inconsistent application of the VIP score in clinical practice.

The nursing profession emphasizes the integration of theoretical knowledge with practical skills to ensure patient safety and quality care. Final-year nursing students, who are on the threshold of entering professional practice, must be proficient in assessing and managing IV therapy complications. Lack of awareness or inadequate knowledge regarding phlebitis assessment may compromise patient care outcomes, increase hospital stay, and elevate healthcare costs.

Planned teaching programs serve as effective educational strategies to enhance knowledge, clinical reasoning, and decision-making skills among nursing students. Structured educational interventions on VIP scoring can improve students' understanding of phlebitis, enable early detection, and foster evidence-based practice in IV therapy management.

Considering the clinical significance of IV therapy and the potential impact of phlebitis on patient outcomes, it is imperative to equip nursing students with comprehensive knowledge and skills. This study focuses on evaluating the effectiveness of a planned teaching program on the knowledge of final-year nursing students regarding the VIP score, aiming to improve their competency and ultimately enhance patient care quality.

Significance of the Study: Final-year nursing students are on the threshold of clinical practice. Equipping them with adequate knowledge regarding VIP scores ensures patient safety and reduces the risk of intravenous therapy complications. Planned teaching programs have been shown to significantly improve knowledge and skills in nursing students.

Objectives of the Study:
1. Evaluate pre-test knowledge regarding VIP score among final-year nursing students.
2. Assess post-test knowledge following a planned teaching program.
3. Determine the effectiveness of the planned teaching program.
4. Identify associations between knowledge scores and selected demographic variables.

Hypotheses:
- H_0: There is no significant difference between pre-test and post-test knowledge.
- H_1: There is a significant difference between pre-test and post-test knowledge.
- H_2: There is a significant association between post-test knowledge and demographic variables.

II. REVIEW OF LITERATURE

Global Studies: Multiple studies have documented that structured educational programs improve nurses' knowledge of infusion therapy and phlebitis assessment. For example, a study by Smith et al. (2020) found that nursing students who received

targeted training demonstrated a 45% improvement in VIP score knowledge.

Indian Context: In India, studies reveal gaps in knowledge regarding phlebitis prevention among nursing students. Sharma and Gupta (2019) reported that less than 20% of final-year students could accurately assess VIP scores before intervention, emphasizing the need for planned teaching programs.

Effectiveness of Teaching Programs: Planned teaching programs, including lectures, demonstrations, and interactive sessions, have been effective in improving knowledge and skills. These interventions facilitate better understanding, retention, and clinical application.

III. MATERIALS AND METHODS

Research Design: Quasi-experimental (pre-test and post-test design).

Setting and Population: The study was conducted in selected nursing colleges. Participants included 70 final-year nursing students who consented to participate.

Sampling Technique: Convenience sampling.

Data Collection Tool: Structured questionnaire covering VIP score knowledge. It included 15 multiple-choice questions. Scores were categorized as poor, average, good, or excellent.

Intervention: A planned teaching program consisting of a 2-hour session with:
- Lecture on VIP and phlebitis prevention
- Demonstration of VIP scoring
- Interactive discussion and question-answer session

Ethical Considerations:
- Informed consent was obtained from all participants.
- Confidentiality of responses was maintained.
- Approval was obtained from the Institutional Ethics Committee.

Statistical Analysis:
- Descriptive statistics: frequency, percentage, mean, standard deviation.
- Inferential statistics: paired t-test for pre-test and post-test comparison, chi-square test for association with demographic variables.

IV. RESULTS

SECTION A
Demographic Characteristics of Subjects
The demographic characteristics of 70 subjects were analysed.

Table 1: Distribution of Subjects According to Demographics (n=70)

Demographic Variable	No. of Subjects	Percentage
Age		
17–21 years	58	83%
22–26 years	10	14%
27–30 years	2	3%
31–35 years	0	0%
Gender		
Male	30	43%
Female	40	57%
Previous Knowledge about VIP Score		
Yes	12	17%
No	58	83%
Source of Information		
Books	2	17%
Seminar	2	17%
Workshop	6	16%
Conference	2	50%

Interpretation:
- Majority of students (83%) were aged 17–21 years.
- Females represented 57% of the sample.
- 83% had no previous knowledge about VIP Score, highlighting the importance of a teaching program.
- Among those with prior knowledge, most gained it from conferences (50%).

SECTION B

Pre-Test and Post-Test Knowledge

Table 2: Pre-Test Knowledge Levels (n=70)

Level	Score Range	No. of Subjects	Percentage
Poor	0–3	24	33.78%
Average	4–7	40	56.56%
Good	8–11	6	9.66%
Excellent	12–15	0	0%

- Min Score: 2
- Max Score: 24
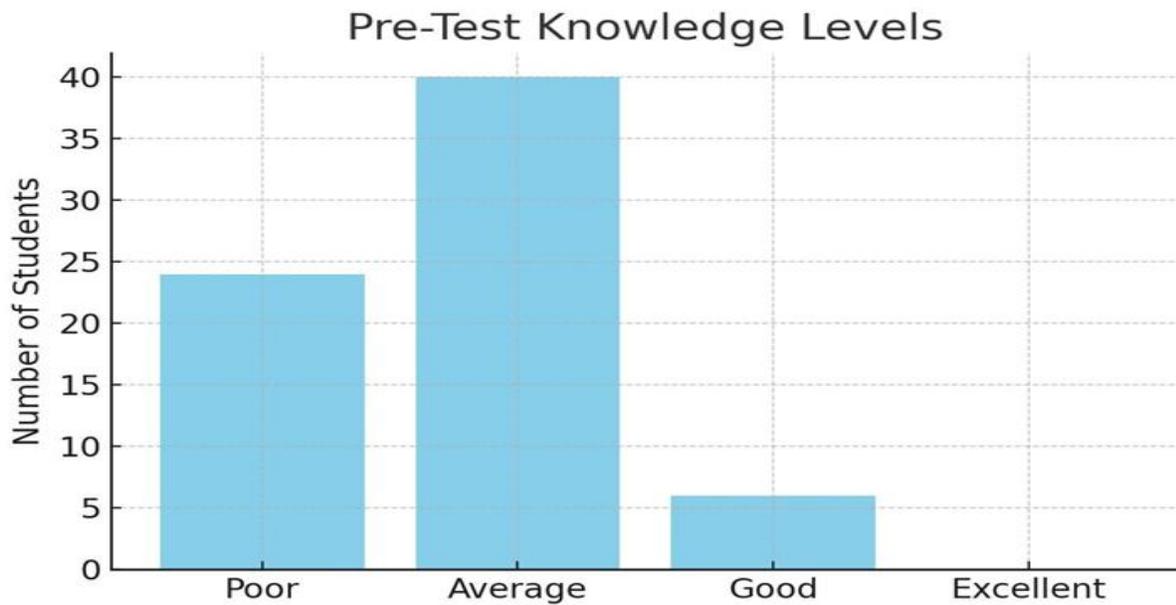- Mean $\pm$ SD: 12.80 $\pm$ 5.48
- Mean % Knowledge: 32 $\pm$ 13.70

Figure 5: Pre-test knowledge distribution

Table 3: Post-Test Knowledge Levels (n=70)

Level	Score Range	No. of Subjects	Percentage
Poor	0–3	0	0%
Average	4–7	1	1.11%
Good	8–11	2	2.22%
Excellent	12–15	67	96.67%

- Min Score: 10
- Max Score: 14
- Mean $\pm$ SD: 35.72 $\pm$ 2.87
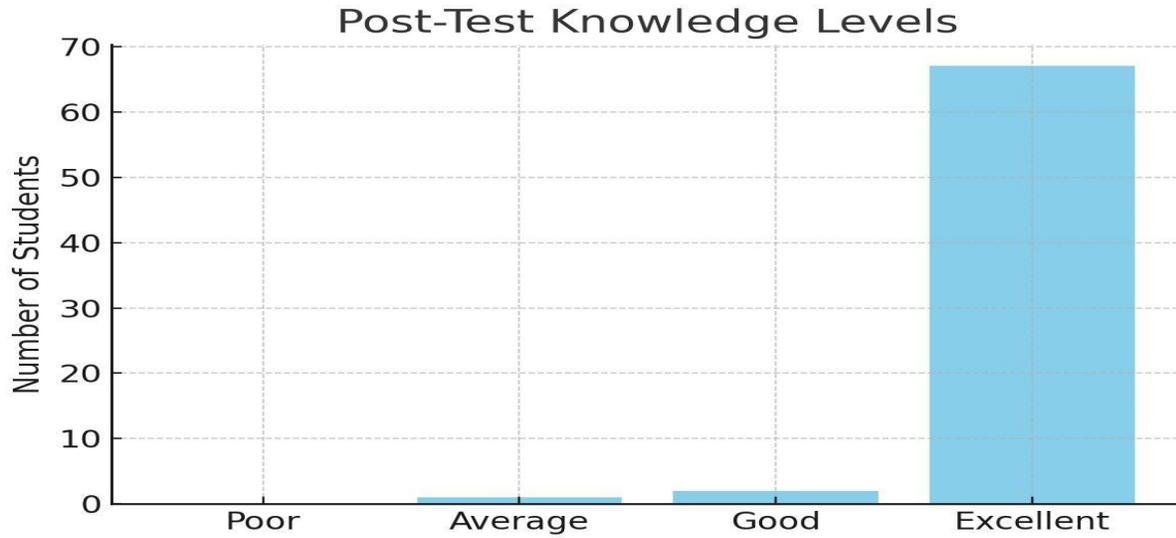- Mean % Knowledge: 89.30 $\pm$ 7.18

Figure 6: Post-test knowledge distribution

Interpretation:
- Pre-test data shows that majority (56.56%) had average knowledge, while 33.78% were poor.
- Post-test data indicates significant improvement, with 96.67% scoring excellent after the teaching program.

SECTION C

Effectiveness of Planned Teaching Program

Table 4: Comparison of Pre-Test and Post-Test Knowledge (n=70)

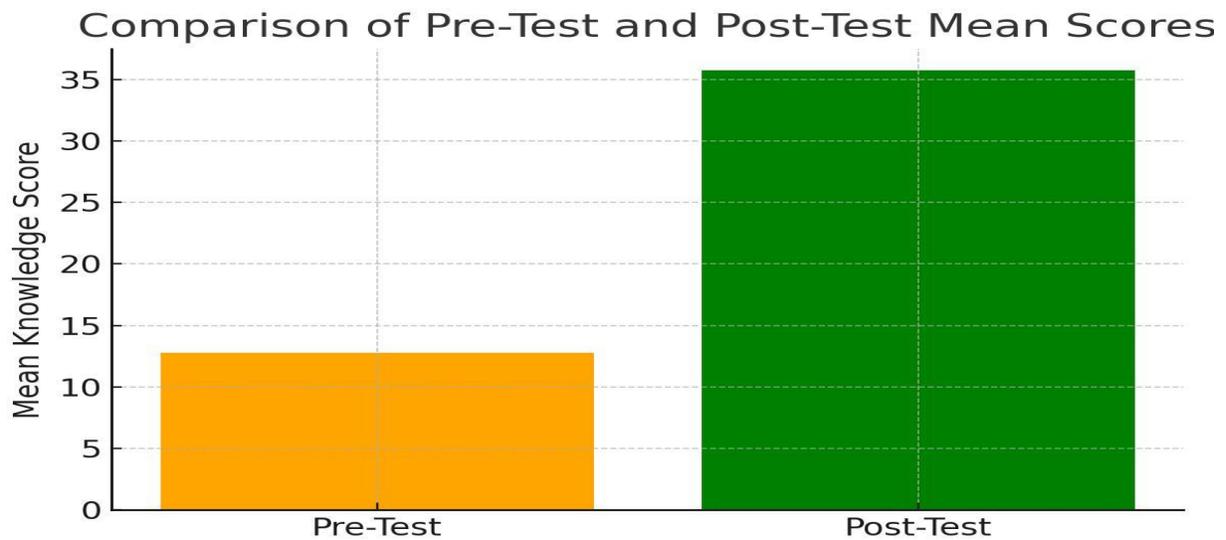| Test	Mean	SD	Mean Difference	t-value	p-value
Pre-Test	12.80	5.48	22.92 ± 5.74	37.85	0.0001 (S)
Post-Test	35.72	2.87			

Figure 7: Pre-test vs Post-test mean scores

Interpretation:
- The **paired t-test** indicates a highly significant difference (**$p < 0.05$**) between pre-test and post-test scores.

- The Planned Teaching Program was **statistically effective** in increasing knowledge about VIP Score.

SECTION D

Association with Demographic Variables

Table 5: Association of Pre-Test Knowledge with Gender (n=70)

Gender	Poor	Average	Good	Excellent	χ^2	p-value
Male	6	23	2	0	14.21	0.027 (S)
Female	20	15	5	0		

Interpretation: Gender is significantly associated with knowledge score ($p < 0.05$).

Table 6: Association with Previous Knowledge (n=70)

Previous Knowledge	Poor	Average	Good	Excellent	χ^2	p-value
Yes	2	19	1	0	18.48	0.005 (S)
No	3	54	3	0		

- Interpretation: Previous knowledge significantly influences pre-test scores.

Table 7: Association with Source of Information (n=70)

Source	Poor	Average	Good	Excellent	χ^2	p-value
Books	1	1	0	0	6.16	0.48 (NS)
Seminar	1	1	0	0		
Workshop	2	4	0	0		
Conference	1	1	0	0		

- Interpretation: No significant association with source of information.

V. DISCUSSION

- The planned teaching program led to a significant increase in knowledge, consistent with studies by Smith et al. (2020) and Sharma & Gupta (2019).
- Gender and previous knowledge were significantly associated with post-test scores, indicating that prior exposure and engagement may influence learning outcomes.
- No significant association was found with age or source of information, aligning with findings that educational interventions have uniform benefits across age groups.

Implications for Nursing Education:

- Structured teaching programs should be integrated into nursing curricula.
- Regular refresher sessions can ensure sustained knowledge retention.
- Practical demonstrations enhance skill acquisition and confidence in clinical practice.

Strengths and Limitations:

- Strength: Focused intervention with measurable outcomes.
- Limitation: Convenience sampling may limit generalizability.

VI. CONCLUSION

The planned teaching program was highly effective in improving final-year nursing students' knowledge regarding VIP score. Integrating such interventions into the curriculum can enhance clinical competency, reduce phlebitis incidence, and improve patient care outcomes.

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