



EFFECTIVENESS OF STRUCTURED TEACHING PROGRAMME ON KNOWLEDGE REGARDING USE OF VISUAL INFUSION PHLEBITIS SCALE AMONG NURSING INTERN STUDENTS IN SELECTED NURSING COLLEGES: A QUASI-EXPERIMENTAL STUDY

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ABSTRACT

Healthcare workers insert peripheral intravenous (PIV) catheters daily into patients in acute care facilities, with an estimated 150 million catheters inserted annually in the United States. Early studies found that 25%-70% of patients receiving PIV therapy developed infusion-related phlebitis, a vein inflammation, with an acceptable rate of phlebitis at 5%. The visual infusion phlebitis (VIP) scale, a modified version of the original Maddox scale, was developed to numerically rate phlebitis based on observable symptoms. This scale recommends specific actions for each numeric rating, eliminating dwell time as the predominant variable for changing peripheral PIV sites. **Objective:** To assess the effectiveness of a structured teaching program on knowledge regarding the use of the VIP scale among nursing intern students in selected nursing colleges. To determine association between post-test knowledge score regarding Use of Visual Infusion Phlebitis (VIP) Scale among Nursing Intern Students in selected Nursing Colleges. The hypothesis is tested at a 0.05 level of significance, with no significant difference between the effectiveness of the structured teaching program and the knowledge score among nursing intern students. **Methodology:** A quantitative, one group pre-test post-test research design was adopted. A total 120 Nursing Intern Students were selected using a non-probability purposive sampling technique and pre-test and post-test knowledge score were measured using self-structured questionnaire. Data were analyzed using descriptive and inferential statistics. **Result:** The study assessed the knowledge of Nursing Intern Students regarding the use of the Visual Infusion Phlebitis (VIP) Scale in selected nursing colleges. 85% of students had good knowledge (41-60%), while 15% demonstrated average knowledge (21-40%). None scored in the very good or excellent categories. However, after the structured teaching program, post-test results showed a significant improvement, with 25.83% achieving good knowledge (41-60%), 71.67% achieving very good knowledge (61-80%), and 2.5% reaching excellent knowledge (81-100%). The Chi-square test revealed no significant association between pre-test knowledge and demographic characteristics, suggesting that prior knowledge levels were independent of demographic characteristics. The results were statistically significant, with a t-value of 25.345, indicating that the structured teaching program was effective in significantly improving participants' knowledge regarding the use of the VIP Scale. The null hypothesis (H_0) was rejected, and the alternative hypothesis (H_1) was accepted. These findings highlight the effectiveness of the structured teaching program in enhancing students' knowledge regarding the use of the VIP Scale and emphasize the need for continued educational interventions in nursing training.

KEYWORDS

Structured Teaching Program, Knowledge, Visual Infusion Phlebitis Scale, Nursing Intern Students.

INTRODUCTION

**"An Ounce of Prevention is Worth a Pound of Cure"
-Benjamin Franklin**

Peripheral intravenous (IV) therapy is a commonly performed clinical procedure but is frequently associated with phlebitis, a preventable complication that may lead to infection, thrombophlebitis, or sepsis if not identified early. Phlebitis can be mechanical, chemical, bacterial, or post-infusion in origin and may occur during catheterization or up to 96 hours after catheter removal.¹

Globally, over one billion peripheral intravenous catheters (PIVCs) are inserted annually. An international audit across 14 hospitals in 13 countries involving 479 patients reported that 59% had at least one PIVC in situ, 16% had idle PIVCs, and 12% showed symptoms of phlebitis.² The Visual Infusion Phlebitis (VIP) Scale, adapted from the Maddox scale, is a validated tool that enables standardized assessment and timely management of phlebitis.³

Nursing interns play a key role in IV therapy administration and monitoring; however, studies indicate gaps in their knowledge and use of the VIP Scale. Strengthening educational interventions through structured teaching programmes can enhance early detection of phlebitis, reduce IV-related complications, and improve patient safety and quality of care.⁴ Strengthening educational interventions through structured teaching programmes can enhance interns' knowledge and application of the VIP Scale, facilitate early identification of phlebitis, reduce IV-related complications, and improve the overall quality of patient care.

BACKGROUND

Peripheral intravenous (IV) cannulation is a routine hospital procedure, yet phlebitis remains the most common associated complication. Indian studies report phlebitis prevalence ranging from 20% to 70%, causing pain, prolonged hospitalization, and increased risk of infection.⁵ The Visual Infusion Phlebitis (VIP) Scale is an internationally accepted, reliable tool for early detection and grading of phlebitis based on observable clinical signs, thereby improving patient safety and quality of care.⁶

Evidence from Indian and international studies indicates a high prevalence of phlebitis among patients with peripheral IV cannulas, with reported rates between 48% and 59% and incidence ranging from 5.2 to 8.1 per 100 catheter days.⁷ Regular surveillance, staff training, and timely interventions significantly reduce phlebitis rates.⁸ However, studies reveal gaps in nurses' knowledge, inconsistent documentation, and limited use of standardized assessment tools.⁹ Nursing interns play a crucial role in IV therapy management, yet inadequate training and inconsistent use of the VIP Scale remain common. Strengthening educational interventions through structured teaching programmes is essential for early recognition of phlebitis, reduction of IV-related complications, and improvement in overall patient care quality.¹⁰

Need For The Study

Peripheral intravenous (IV) therapy is a routine nursing procedure, yet phlebitis remains a common and preventable complication. Early detection using standardized tools such as the Visual Infusion Phlebitis (VIP) Scale is essential to reduce infection, patient discomfort, and healthcare costs. However, evidence indicates that nursing interns often lack adequate knowledge and confidence in using the VIP Scale due to limited training during undergraduate education.¹¹

Studies report phlebitis prevalence ranging from 25% to 59% in India, exceeding the acceptable benchmark of $\leq 5\%$. Research further shows a significant association between nurses' knowledge and practice levels, highlighting the need for structured educational interventions.¹² Nursing interns, being in a transitional phase, require focused training to bridge the gap between theory and clinical practice.

Therefore, evaluating the effectiveness of a Structured Teaching Programme (STP) on the use of the VIP Scale is necessary to enhance nursing interns' knowledge, promote early recognition of phlebitis, reduce IV-related complications, and improve the quality of patient care.

A study was conducted to assess the incidence and risk of infusion phlebitis with peripheral intravenous catheters (2024). The study

involved 300 patients over 18 years of age with PICCs in place from medical, surgical, and intensive care units of SKIMS, Srinagar. Factors such as age, gender, reason for cannulation, site of insertion, situation of insertion, cannula/catheter size, dwelling time of catheter, IV medications, and family history of thrombophlebitis were considered. The incidence of phlebitis was found to be 25.33%. The increased incidence rate was observed in the age group of 36-55 years, female gender, IV drug administration, large catheter size (18G), insertion in the dorsum of hand, catheters inserted in emergency situations, cannulation duration of 96 hours, and family history of thrombophlebitis. The study concluded that phlebitis is an adverse complication that needs to be arrested before it reaches the bloodstream. Prevention strategies include avoiding preventable risk factors, proper health professional practices, judicious intravenous medication administration, and daily catheter inspection.¹³

OBJECTIVE OF THE STUDY

Primary Objectives

1. To Assess the Effectiveness of structured teaching programme on knowledge regarding Use of Visual Infusion Phlebitis (VIP) Scale among Nursing Intern Students in selected Nursing Colleges.
2. To determine association between post-test knowledge score regarding Use of Visual Infusion Phlebitis (VIP) Scale among Nursing Intern Students in selected Nursing Colleges.

Secondary Objective

1. To assess the existing knowledge regarding Use of Visual Infusion Phlebitis (VIP) Scale among Nursing Intern Students in selected Nursing Colleges.

Research Method and Material

A quantitative research approach was adopted for the present study, using a one-group pre-test post-test quasi-experimental research design. The study was conducted in selected nursing colleges, and the study population comprised Nursing Intern Students. A total of 120 nursing intern students were selected by using a non-probability purposive sampling technique. The research tool used for data collection was a self-structured knowledge questionnaire developed by the investigator to assess knowledge regarding the use of the Visual Infusion Phlebitis (VIP) Scale. The tool consisted of two sections: Section A, which included demographic variables such as age, gender, religion, nursing course, residential area, previous knowledge, and source of information; and Section B, which consisted of structured multiple-choice questions related to the VIP Scale. The questionnaire was validated by experts, and its reliability was established through appropriate statistical methods. A Structured Teaching Programme (STP) on the use of the Visual Infusion Phlebitis Scale was prepared and administered to the participants after the pre-test. The post-test was conducted using the same questionnaire to evaluate the effectiveness of the teaching programme. Data were analyzed using descriptive and inferential statistics, including mean, standard deviation, paired 't' test, and chi-square test to assess effectiveness and association with demographic variables.

RESULTS

The study findings revealed that the majority of nursing intern students were aged 20–21 years (54.17%), predominantly female (85%), and all were GNM interns. Most participants belonged to urban areas (73.33%), had prior knowledge of the Visual Infusion Phlebitis (VIP) Scale (60.83%), and obtained information mainly from mass media (68.33%). Pre-test assessment showed that most students had good knowledge of the VIP Scale, with a mean score of 15.05 ± 2.17 , while 15% had average knowledge and none scored in the poor, very good, or excellent categories. Following the Structured Teaching Programme, there was a marked improvement in knowledge, with 71.67% achieving very good knowledge, 25.83% good knowledge, and 2.50% excellent knowledge, and no participants remaining in the poor or average categories. The mean post-test knowledge score increased significantly to 19.441 ± 1.999 , and the paired t test ($t = 25.345$, $p = 0.000$) confirmed the effectiveness of the teaching programme. Chi-square analysis showed no significant association between post-test knowledge scores and selected demographic variables, indicating that the improvement in knowledge was consistent across all groups and primarily attributable to the Structured Teaching Programme.

Table 1: Comparison of the Knowledge Regarding use of Visual Infusion Phlebitis Scale Among Nursing Intern Students (Paired t test) n=120

Test	N	Mean	SD	t value	Significance (2 tailed)
Pre-Test	120	15.075	2.177	25.345	0.000
Post test	120	19.441	1.999		

DISCUSSION

The present study demonstrated that the Structured Teaching Programme was effective in improving nursing intern students' knowledge regarding the use of the Visual Infusion Phlebitis (VIP) Scale. Similar studies have reported significant improvement in nurses' knowledge and practices related to phlebitis assessment following structured educational interventions. Previous research also indicated no significant association between demographic variables and knowledge gain, which is consistent with the findings of this study. The improvement in post-test knowledge highlights the importance of structured education in enhancing theoretical understanding and clinical application. These findings support the need for continuous educational programmes to strengthen nursing interns' competence in intravenous therapy and promote patient safety.

CONCLUSION

The study found that nursing intern students had limited knowledge about Phlebitis complications in pre-test. However, after the introduction of a structured teaching program (STP), their post-test knowledge score significantly increased. The study found that demographic variables did not significantly influence knowledge scores. The investigator's written material, in the form of STP, significantly improved nursing intern students' knowledge on the Use of Visual Infusion Phlebitis scale. The intervention was effective across all demographic segments, emphasizing its value as a universal educational tool for improving clinical competence in infusion monitoring and patient safety. The findings provide strong evidence that the STP is a valuable educational tool for improving clinical competence in infusion monitoring and patient safety.

Recommendation

Further large-scale and comparative studies are recommended to evaluate and generalize the effectiveness of teaching programmes on the use of the Visual Infusion Phlebitis Scale among nursing interns across different settings.

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