Original Research

A study to evaluate the effectiveness of structured teaching programme on knowledge regarding complication of intravenous therapy its prevention and management among staff nurse in selected hospital in Noida

[1]Prasidh Narayan Pathak, [2]Monika Dean

[1]Assistant Professor, Department of Medical Surgical Nursing(Critical care), Kailash Institute of Nursing and Paramedical Science, Greater Noida, India;
[2]PhD Scholar, Department of Obstetrics and Gynaecology, Teerthanker Mahaveer College of Nursing,, Moradabad, India

ABSTRACT:
Aim: A Study to evaluate the effectiveness of structured teaching programme on knowledge regarding complication of intravenous therapy its prevention and management among staff nurse in selected hospital in Noida. **Material and methods:** The sample for the present study comprised of 50 staff nurses who were present in kailash hospital in the time of data collection and were selected by using purposive sampling technique. The participants who were registered in the nursing council, willing to participate in the study and present at the time of study were included in the study. One group pre-test design with pre-experimental approach was adopted in this study. In this design, the dependent variable is measured before the introduction of the treatment. The treatment is then introduced and the dependent variable is measured again after the treatment. O1: Administration of structured knowledge questionnaire on knowledge regarding complication of intravenous therapy its prevention and management. X: Conducting planned teaching program on knowledge regarding complication of intravenous therapy its prevention and management O2: Administration of structured knowledge quessionnaire on knowledge regarding complication of intravenous therapy its prevention and management on 3rd day. The schematic representation of study design is presented in 3 phase. **Results:** The findings of the present study reveal that highest percentage (84%) of the respondents had average knowledge, (10%) had poor knowledge and only (6%) of the respondent have good knowledge regarding complication intravenous therapy. The above findings reveal that most of the staff nurses had average knowledge regarding complication intravenous therapy. Thus Staff nurses need to be educated regarding complication intravenous therapy. The findings of the present study reveal that highest percentage (92%) of the respondents had good knowledge, (0%) had Poor knowledge and (8%) of the respondent have average knowledge regarding complication intravenous therapy. The above findings reveal that most of the staff nurses had Good knowledge regarding complication intravenous therapy. Now the majority of Staff nurses need effective knowledge regarding complication intravenous therapy. These findings indicate that there is significant increase in the knowledge scores of staff Nurses regarding complications of intravenous therapy after the planned teaching programme. **Conclusion:** The study demonstrates that a structured teaching program significantly enhances the knowledge of staff nurses regarding complications of IV therapy, its prevention, and management. This is evident from the substantial increase in post-test knowledge scores compared to pre-test scores. The findings align with other studies in the field, suggesting that educational interventions are crucial in bridging knowledge gaps and improving clinical practice among nurses. Continuous education and professional development should be integral components of nursing practice to ensure high standards of patient care and safety.
Keywords: Structured teaching programme, Complication, Intravenous Staff nurse

INTRODUCTION

Intravenous therapy (abbreviated as IV therapy) is a medical technique that delivers a liquid directly into a person's vein. The intravenous route of administration is commonly used for rehydration solutions or to provide nutrition in those who cannot consume food or water by mouth. It may also be used to administer medications or other medical therapy such as blood products or electrolytes to correct electrolyte imbalances. Attempts at providing intravenous therapy have been recorded as early as the 1400s, but the practice did not become widespread until the 1900s after the development of techniques for safe, effective use.[1,2]

The intravenous route is the fastest way to deliver medications and fluid replacement throughout the body as they are introduced directly into the circulatory system and thus quickly distributed throughout the body. For this reason, the intravenous route of administration is also used for the consumption of some recreational drugs.[3,4] Many therapies are administered as a "bolus" or one-time dose, but they may also be administered as an extended infusion or drip. The act of administering a therapy intravenously, or placing an intravenous line ("IV line") for later use, is a procedure which should only be performed by a skilled professional. The most basic intravenous access consists of a needle piercing the skin and entering a vein which is connected to a syringe or to external tubing. This is used to administer the desired therapy.[5,6] In cases where a patient is likely to receive many such interventions in a short period (with consequent risk of trauma to the vein), normal practice is to insert a cannula which leaves one end in the vein and subsequent therapies can be administered easily through tubing at the other end.[7-10] In some cases, multiple medications or therapies are administered through the same IV line. IV lines are classified as "central lines" if they end in a large vein close to the heart, or as "peripheral lines" if their output is to a small vein in the periphery, such as the arm. An IV line can be threaded through a peripheral vein to end near the heart - this is termed a "peripherally inserted central catheter" or PICC line. If a person is likely to need long-term intravenous therapy, a medical port may be implanted to enable easier repeated access to the vein without having to pierce the vein itself each time.[11,12] A catheter can also be inserted into a central vein through the chest - which is termed a tunneled line. The specific type of catheter used and site of insertion are affected by the desired substance to be administered and the health of the veins in the desired site of insertion.[10]

Placement of an IV line may cause pain, as it necessarily involves piercing the skin. Infections and inflammation (termed phlebitis) are also both common side effects of an IV line. Phlebitis may be more likely if the same vein is used repeatedly for intravenous access, and can eventually develop into a hard cord which is unsuitable for IV access. The unintentional administration of a therapy outside a vein, termed extravasation or infiltration, may cause other side effects.[11]

MATERIAL AND METHODS

In the present study, population includes registered nurses with diploma and degree who were working in the selected hospital in Noida at the time of data collection. The sample for the present study comprised of 50 staff nurses who were present in kailash hospital in the time of data collection and were selected by using purposive sampling technique. The participants who were registered in the nursing council, willing to participate in the study and present at the time of study were included in the study. The nurses who were on long leave and those who were not willing to participate were excluded from this study.

One group pre-test design with pre-experimental approach was adopted in this study. In this design, the dependent variable is measured before the introduction of the treatment. The treatment is then introduced and the dependent variable is measured again after the treatment.

O1: Administration of structured knowledge questionnaire on knowledge regarding complication of intravenous therapy its prevention and management.

X: Conducting planned teaching program on knowledge regarding complication of intravenous therapy its prevention and management

O2: Administration of structured knowledge quessionnaire on knowledge regarding complication of intravenous therapy its prevention and management on 3rd day.

The schematic representation of study design is presented in 3 phase.

Phase I: Pre-test was conducted on the first day for Staff Nurses and knowledge on knowledge regarding complication of intravenous therapy its prevention and management was assessed by using structured knowledge questionnaire.

Phase II: Planned teaching Programme on knowledge regarding complication of intravenous therapy its prevention and management was given on the same day by using charts, models and blackboard.

Phase III: Post-test was conducted for staff nurses on the third day by using the same tool.

The average time taken to complete the knowledge questionnaire was 25 minutes for each subject and one hour of planned teaching programme which was acceptable by the subjects. No changes were made in the tool.

Part 1: Structured Questionnaire to Collect the demographic data (5 items): -

It included identification of data such as age, gender, educational qualification, working experience and current working position.

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Part II - Structured knowledge questionnaire to measure the knowledge on complication and prevention of intravenous therapy (35 items).

It included various item on knowledge on knowledge regarding complication of intravenous therapy its prevention and management under the following areas.

• Anatomy – 3 items.
• Phlebitis- 5 items
• Procedure of cannulation – 7 items.
• Signs and symptoms phlebitis– 8items
• Classification of phlebitis– 3 items
• Causes/ predisposing factors – 4items
• Assessment – 4 items
• Prevention of phlebitis – 5 items
• Management of phlebitis – 4 items

The structured knowledge questionnaire was administered to find out the pre – test knowledge, on knowledge regarding complication of intravenous therapy its prevention and management. The planned teaching programme was given on the same day for a period of one and a half hour in one sessions for 50 nurses. The A.V aids used for planned teaching programme are ppt and marker board. The post test was conducted on third day of teaching programme by administering same structured knowledge questionnaire.

A planned teaching programmeon knowledge regarding complication of intravenous therapy its prevention and management was developed for staff nurses. It was developed based on extensive review of researched and non – researched literature and expert's opinion from the related field. An evaluation criteria check list for content validity of the Planned Teaching Programme for assessing the appropriateness, adequacy and accuracy of formulation of objectives, selection and organization of the content, presentation language and practicability was prepared.

DATA ANALYSIS
Data was planned to be analysed on the basis of objectives and hypothesis. Demographic data would be analysed in terms of frequency and percentage. The knowledge scores of staff nurses before and after the planned teaching Programme would be analysed in terms of frequency, percentage mean median and standard deviation. The significant difference between the mean of pre and post-test knowledge scores would be determined by Paired 't' test.

RESULTS
Gender wise distribution of the subjects shows that (3) were male and (47) of the subjects were female staff nurses.Age wise distribution of the subjects shows that (84%) were in the age group of 20-30, (16%) of the subjects was in the age group of 31-40 and no subjects were in the age group 41-50 and above 30. Percentage distribution of the staff nurses shows that highest percentage (60%) of the subjects were having diploma in nursing (GNM) (26%) B.Sc. Nursing and (24%) Post B.Sc. Nursing. Percentage distribution of the Staff Nurses according to their working experience shows that most (42%) of the staff nurses were having more than 3 years of experience, (34%) have 0-1 years of experience, (20%) have 1-2 year of experience and (4%) only have experience of 2-3 years. Percentage distribution of staff nurses according to their current working position shows that majority (50%) were working as an Junior Staff Nurse, (44%) were senior staff nurse and (6%) were working as ward in charge and no subjects comes under the category of ward supervisor.

Table: 1. Frequency and percentage distribution of the demographic variables

Variables	Frequency	Percentage
Gender		
Male	3	6%
Female	47	94%
Age (in years)		
20 – 30	42	84%
31 – 40	8	16%
41 – 50	-	
Above 30	-	
Educational Status		
ANM	-	-
GNM	30	60%
B.Sc. Nursing	13-	26%
Post-Basic B.Sc. Nursing	12	24%
Work experience (in years)		
0-1	17	34%
1-2	10	20%
2-3	2	4%
> 3	21	42%
Current Working Position		

Junior Staff Nurse	25	50%
Senior Staff Nurse	22	44%
Ward in-charge	3	6%
Ward Supervisor	-	-

The findings of the present study reveal that highest percentage (84%) of the respondents had average knowledge, (10%) had poor knowledge and only (6%) of the respondent have good knowledge regarding complication intravenous therapy.The above findings reveal that most of the staff nurses had average knowledge regarding complication intravenous therapy. Thus Staff nurses need to be educated regarding complication intravenous therapy

Table 2: Level of Knowledge of Staff Nurses regarding intravenous complication

Level of knowledge	Range of Scores	No. of respondents	Percentage (%)
Poor	0-15	05	10
Average	16 – 25	42	84
Good	26- 35	3	6
	Total	**50**	**100**

Table 3: Level of Knowledge of Staff Nurses regarding intravenous complication after intervention

Level of knowledge	Range of Scores	No. of respondents	Percentage (%)
Poor	0-15	0	0
Average	16 – 25	4	8
Good	26- 35	46	92
	Total	50	100

The findings of the present study reveal that highest percentage (92%) of the respondents had good knowledge, (0%) had Poor knowledge and (8%) of the respondent have average knowledge regarding complication intravenous therapy.The above findings reveal that most of the staff nurses had Good knowledge regarding complication intravenous therapy. Now the majority of Staff nurses need effective knowledge regarding complication intravenous therapy. These findings indicate that there is significant increase in the knowledge scores of staff Nurses regarding complications of intravenous therapy after the planned teaching programme.

Table 4: Table shows the mean value of Pre-Test and Post-test

	Mean Value	N	Std. Deviation	Mean percentage
Pre -test	20.3200	50	4.78279	58.05
Post -test	31.8600	50	2.92079	91.02

Table 5: Table shows the comparison of pre-test and post-test knowledge score

Group	Mean Score	Mean Percentage	Effectiveness
Pre-Test (X)	20.32	58.05	11.54
Post-Test (Y)	31.86	91.02	32.97%

The data presented in the table shows that mean percentage of knowledge score of the pre-test and post-test. Finding shows that pre-test mean percentage (58.05%) with mean (20.32). Whereas post-test mean percentage (91.02%) with mean value (31.86). It reveals an increase of (32.97%) in the total mean percentage of knowledge score of staff nurses regarding complication & prevention of intravenous therapy". This reveals that Planned Teaching Programme is very effective in increasing the knowledge of staff nurses on complication & prevention of intravenous therapy".To evaluate the effectiveness of planned teaching programme, a null hypothesis was framed. H1: There will be significant difference in the pre-test knowledge scores and post-test knowledge scores of staff nurse on knowledge regarding complications of intravenous therapy, its prevention and management. [Research hypothesis] H01: There will be no significant difference in the pre-test knowledge scores and post-test knowledge scores of staff nurse on knowledge regarding complications of intravenous therapy, its prevention and management. Paired "t" test was used to analyse the difference in knowledge scores of staff nurses in pre-test and post-test.

Table 6: Significance of difference between the pre-test and post-test knowledge scores of staff nurses regarding complication & prevention of intravenous therapy"

Pair 1	Mean	N	Std. Deviation	Std. Error Mean
Pretest	20.32	50	4 .783	0.676
Posttest	31.86	50	2.921	0.413
Posttest	31.86	50	2.921	0.413

Finding revealed that the mean post-test score of staff nurses was significantly higher than mean pre-test score. The calculated "t" value was greater than the table value at 0.01% level. Hence the null hypothesis was rejected and research hypothesis was accepted indicating that the gain in knowledge was not by chance. Therefore it is concluded that the gain in knowledge of staff nurses through planned teaching programme on prevention complication and management of intravenous therapy. Asses the knowledge regarding complications of intravenous therapy, its prevention and management among staff nurse .

Table 7: Level of knowledge

Level of knowledge	Range of Scores	No. of respondents	Percentage (%)
Poor	0-15	05	10
Average	16 – 25	42	84
Good	26- 35	3	6
	Total	50	100

The findings of the present study reveal that highest percentage (84%) of the respondents had average knowledge, (10%) had poor knowledge and only (6%) of the respondent have good knowledge regarding complication intravenous therapy. The above findings reveal that most of the staff nurses had average knowledge regarding complication intravenous therapy. Thus Staff nurses need to be educated regarding complication intravenous therapy.

DISCUSSION
The study conducted to evaluate the effectiveness of a structured teaching program on knowledge regarding complications of intravenous (IV) therapy, its prevention, and management among staff nurses shows significant findings. The demographic analysis revealed that the majority of the subjects were female (94%), aged between 20-30 years (84%), and had a diploma in nursing (GNM) (60%). This demographic distribution aligns with global nursing demographics, where female nurses typically dominate the workforce, especially in younger age groups .The educational background of the nurses showed that 60% had a General Nursing and Midwifery (GNM) diploma, 26% had a Bachelor of Science in Nursing (B.Sc. Nursing), and 24% had a Post-Basic B.Sc. in Nursing. This indicates a mix of foundational and advanced nursing education among the participants, which could impact their baseline knowledge and receptivity to additional training .
The findings indicated that before the intervention, a significant proportion of the nurses had only average knowledge (84%) regarding the complications of IV therapy, with 10% having poor knowledge and only 6% having good knowledge. Post-intervention, there was a marked improvement, with 92% demonstrating good knowledge, 8% average, and none with poor knowledge. This improvement is statistically significant as evidenced by the paired t-test results, where the mean pre-test score was 20.32 (58.05%) and the mean post-test score was 31.86 (91.02%). The effectiveness of the teaching program is underscored by the 32.97% increase in knowledge scores .

These findings are consistent with other studies that have evaluated educational interventions for healthcare professionals. For instance, a study by Amrein et al. found that targeted educational programs significantly improved the knowledge and practice behaviors of nurses regarding critical care protocols . Similarly, Zittermann et al. demonstrated that structured educational interventions led to improved knowledge and clinical outcomes in nursing practices .[6]

In another study by Parekh et al., a structured teaching program on managing acute lung injuries among nurses resulted in a significant improvement in knowledge and application of clinical guidelines .[7] This further corroborates the findings of the current study, indicating that well-structured educational interventions are highly effective in enhancing the knowledge base and clinical competencies of nursing staff.

The results of this study underscore the importance of continuous education and training for nursing staff. The significant increase in knowledge post-intervention suggests that regular, structured educational programs can effectively address knowledge gaps and improve clinical practice standards. Hospitals and healthcare institutions should therefore prioritize ongoing professional development programs to ensure that nursing staff are well-equipped to manage and prevent complications associated with IV therapy .

Moreover, the study highlights the need for tailored educational content that addresses specific knowledge deficiencies and aligns with the existing educational

background of the nursing staff. Given the diversity in nursing education and experience, as reflected in the study demographics, personalized and adaptive teaching strategies may further enhance learning outcomes and clinical efficacy .

CONCLUSION

The study demonstrates that a structured teaching program significantly enhances the knowledge of staff nurses regarding complications of IV therapy, its prevention, and management. This is evident from the substantial increase in post-test knowledge scores compared to pre-test scores. The findings align with other studies in the field, suggesting that educational interventions are crucial in bridging knowledge gaps and improving clinical practice among nurses. Continuous education and professional development should be integral components of nursing practice to ensure high standards of patient care and safety .

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