

## A study to assess the knowledge and practice of nurses on care of peripheral lines.

Mr. Jishnu K.S<sup>1</sup>, Ms. M.J. Jenipha Elizabeth<sup>2</sup>, Ms. Basemath .S.S.Morris<sup>3</sup>

<sup>1</sup>Registered nurse, Apollo First Med, Kilpauk, Chennai, Tamil Nadu.)

<sup>2</sup>Nursing Head, Apollo First Med, Kilpauk, Chennai, Tamil Nadu.)

<sup>3</sup>(Nurse Educator, Apollo Cancer Center, Teynampet, Chennai, Tamil Nadu.)

### Abstract

**Background:** Nurses commonly performs intravenous (IV) cannulation, which is a simple and lifesaving procedure in hospital setup. Peripheral line related complications tend to increase in hospital setup as there are more cases of phlebitis, thrombosis and infiltration are reported. This paved a way forward to assess the knowledge and practice of nurses on care of peripheral line and the need for necessary intervention to improve safe IV line practice and early prevention of IV line related complications.

**Materials and Methods:** A Pre-experimental and one group pretest and posttest design was used to assess the knowledge and practice of 30 nurses on care of peripheral lines. A structured questionnaire was developed to assess the knowledge of the nurses and an observational checklist to check the practice of IV line care. The study started with the pretest followed by structured teaching program and posttest.

**Results:** The post test showed a significant improvement in the knowledge regarding IV assess, identifying complications using VIP score and practice of nurses on care of peripheral line. In the pretest 24 nurses had average and 6 had poor level of knowledge. The post test revealed that 22 nurses had excellent knowledge and 8 had average level of knowledge. Paired t-test value of knowledge and practice was 11.9 and 18.2 respectively, which was higher than the table value 0.699 at  $p < 0.05$  hence the structured teaching program was found to be effective in improving the knowledge and practice of the nurses.

**Conclusion:** Nurses acquired knowledge regarding IV cannulation and its care. Also have an improvement in safe IV line practice and preventing complications at the earliest itself and also became skillful in handling IV line, identifying signs of infection and preventing complications.

**Key word:** Care of peripheral lines, Intravenous cannulation, knowledge, practice, structured teaching program.

Date of Submission: 21-03-2022

Date of Acceptance: 03-04-2022

### I. Introduction

Intravenous cannulation is the most commonly performed procedure by nurses in every hospital. It is a small sterile plastic tube mounted on a needle for assessing patient blood stream for therapeutic purposes. Nurses are performing this procedure more often and shows an expertise in minimize blood loss, unwanted puncture and tissue damage. Proper handling of intravenous line prevents complications and patient chances for acquiring healthcare associated infection.

Nurse's role in care of peripheral line is to prevent possible complication such as extravasations, infiltration, phlebitis, thrombosis and air embolism over the puncture site. There was about 6-8 cases of IV line associated complications in our hospital per month. The main focus of the study was to reduce IV line complication, to determine the knowledge and practice of nurses towards care of peripheral lines and its complication.

### II. Material and Methods

**Study Design:** Pre-experimental and one group pretest and posttest design.

**Study Location:** Apollo First Med Hospital, Kilpauk, Chennai, Tamil Nadu.

**Study Duration:** October –December 2021

**Sample size:** 30 Registered Nurses

**Sample size calculation:** the sample size was estimated on the basis of total population of 100 nurses in which 5 nurses were selected from each department such as ER, ICU, HDU, general ward, D ward, and E ward.

**Subjects & selection method:** Non probability convenience sampling method was applied to select the samples

**Inclusion criteria:**

1. Nurses working in general ward, ICU & ER having one or more than one year experience in the hospital.
2. Register staff nurse who are willing to participate in the study.

**Exclusion criteria:**

1. Nurse in ER, ICU, and General Ward who are not willing to participate in the study.
2. Nurses who are less than one month of experience.
3. Nurses who are on leave during data collection time

**Procedure methodology**

A structured questionnaire was used to collect data regarding nurses’ knowledge on IV line care. The questionnaire consists of self-declaration for study, area of work, experience, qualification and designation of work. A multiple choice questionnaire used to assess the knowledge, consist of 10 questions in which each question carries 1 mark. It includes the parameter such as assessment of IV line, aseptic techniques, complications and management. An observational checklist was used to collect data regarding nurse’s practice on care of IV line which consist of 20 questions in that each one carries 1 mark. It include the parameters such as patient preparation, articles arrangement, selection of vein, hand hygiene, insertion of IV cannula, documentaion, VIP score, administration of IV medication,hospital protocol for changing IV set and IV line, waste management.

A randomly selected 30 nurses under inclusion criteria had done the pretest for assessing knowledge and practice. Hands on training were conducted to for nurses in regard to improve the knowledge on care of IV lines. Hands on training was conducted for nurses in regard to IV cannulation, handling of IV line, assessing site using VIP score and observing early signs of complications. Posttest for assessing knowledge and practice had conducted using same questionnaire and observational checklist on the same sample.

**Statistical analysis**

The data was analyze during Descriptive [Frequency and percentage], the effectiveness of the structured teaching program was assessed using inferential statistics [t test].The level  $p < 0.05$  was considered as the cut off value or significance.

**III. Result**

After successfully educating the nurses who engaged in the study, their knowledge level has improved by showing difference in the parameters which is statistically significant. Their practical knowledge has improved which is evident in posttest with significant difference in the parameters.

**Table 1** shows demographic variables with percentage distribution according to (a) year of experience - 8 (27%) of nurses had to 1 month-year of experience, 13 (43%) had 1-2 years of experience and 9 (30%) had more than 2 years of experience. Based on (b) designation, 21 (70%) of them were staff nurses and 9 (30%) of them were senior staff nurses. In regard to the(c) qualification- 4 (13%) nurses were GNM nursing, 25 (84%) were bachelor in nursing and 1 (3%) masters in nursing. (d)Area of work -12 (40%) nurses were from critical care unit and 18 (60%) nurses were from general wards.

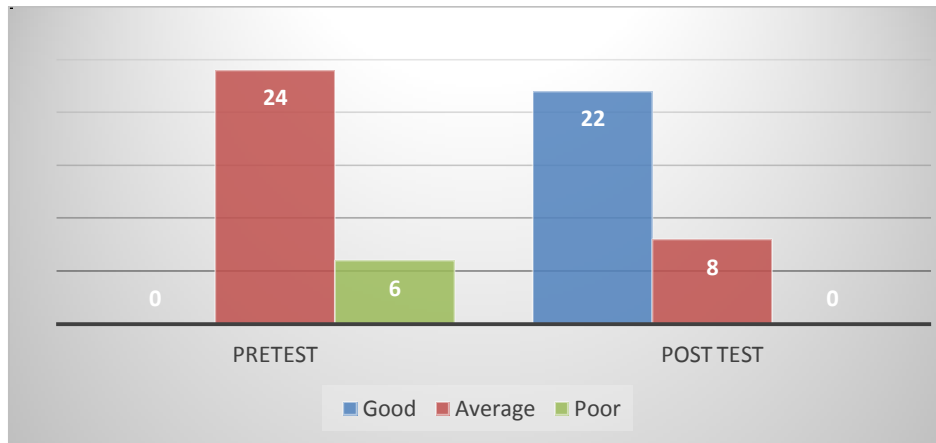
**Table1 - demographic variables with percentage distribution**

Sl. No.	Demographic variable	Frequency (n)	Percentage (%)
1	<u>Year of experience</u>		
	a) 1 month-year	8	27%
	b) 1-2 years	13	43%
	c) More than 2 years	9	30%
2	<u>Designation</u>		
	a) Staff nurse	21	70%
	b) Senior staff nurse	9	30%
3	<u>Qualification</u>		
	a) GNM nursing	4	13%
	b) Bachelor in nursing	25	84%
	c) Master in Nursing	1	3%
4	<u>Working place</u>		
	a) Critical care unit	12	40%
	b) General wards	18	60%

Table no 2 shows the knowledge level of the nurses. In the pretest 24 (80%) nurses had average level of knowledge and 6(20%) had poor knowledge. Whereas, in posttest 22(73.4%) nurses had good knowledge and 8(26.6%) had average level.

**Table 2-The level of knowledge in Pretest and Posttest**

Level of Knowledge	Good		Average		Poor	
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
Pretest	0	0%	24	80%	6	20%
Post test	22	73.4%	8	26.6%	0	0%



**Table 3** shows the practice level of nurses on care of IV line done using observational checklist which include the parameters such as patient preparation, articles arrangement, selection of vein, hand hygiene, insertion of IV cannula, documentaion, VIP score, administration of IV medication,hospital protocol for changing IV set and IV line, waste management. The level of practice in pretest showed 18 (60%) nurses had average level of practice and 12(40%) were poor.In the post test 27 (90%) nurses had good and 3 (10%)of them with average level of practice.

**Table 3- Practice level of nurses with pretest and post test**

Level of practice	Good		Average		Poor	
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
Pretest	0	0%	18	60%	12	40%
Post test	27	90%	3	10%	0	0%

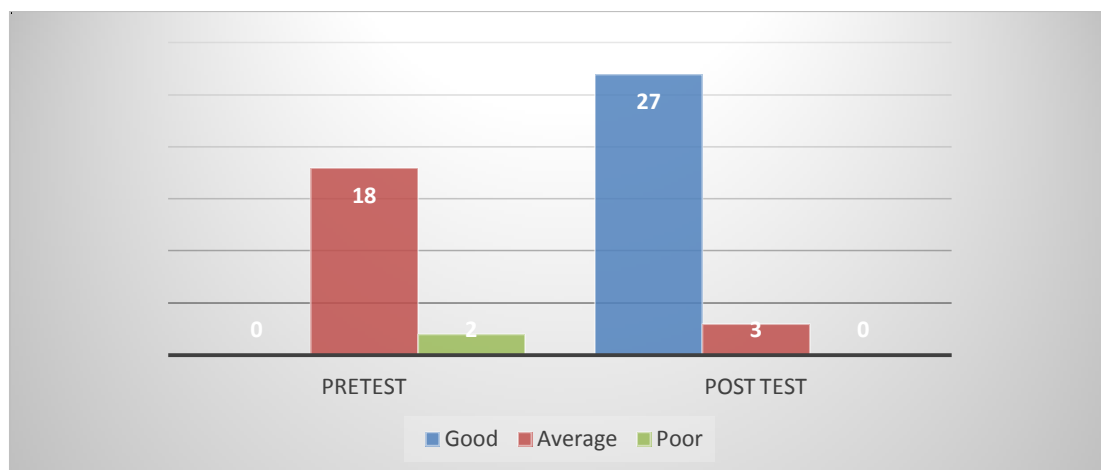
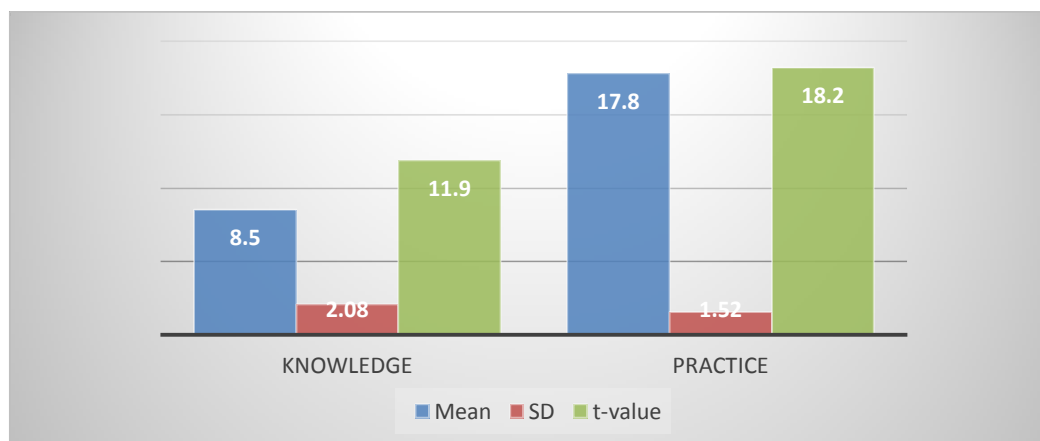


Table 4 shows Paired t-test value of knowledge and practice was 11.9 and 18.2 respectively, which was higher than the table value 0.699 at  $p < 0.05$  hence the structured teaching program was found to be effective in improving the knowledge and practice of the nurses

**Table 4** Effectiveness of structured teaching program on knowledge and practice of the nurses.

	Mean	Mean%	SD	t-value	$p > 0.05$
Knowledge	8.5	28.3%	2.08	11.9	0.699
Practice	17.8	59.3%	1.52	18.2	



#### IV. Discussion

Intravenous cannulation is the most commonly performed procedure by nurses in every hospital. It is a small sterile plastic tube mounted on a needle for assessing patient blood stream for therapeutic purposes. Nurses are performing this procedure more often and shows an expertise in minimize blood loss, unwanted puncture and tissue damage. Proper handling of intravenous line prevents complications and patient chances for acquiring healthcare associated infection.

There are cases reported in the hospital regarding IV line related complications which have been occurred due to lack of observation and improper handling. A descriptive study by **Zonobia Qamar et.al,(2018)** to assess the knowledge and practice towards care and maintenance of peripheral intravenous cannulation in Services Hospital, Lahore, Pakistan with 240 nurses using a structured questionnaire. The result concluded that nurses have good knowledge regarding IV cannula protocols but still their practices are not according to the standard protocols.<sup>1</sup> Hence concluded that hands on training is essential to improve the skill of the nurses.

Pretest was conducted on 30 staff nurses among them 24(80%) had average level of knowledge and 6(20%) had poor knowledge. With regard to the level of practice 18 were average and 12 poor level of practice.

A structured teaching programme was conducted to all nurses regarding IV line insertion, care of IV line and complications associated with improper handling of peripheral lines. Hands on training given for nurses in regard to IV cannulation, handling of intravenous line, assessing site using VIP score and observing early signs of complications.

Post test conducted to assess the knowledge and practice of nurses after the intervention which showed a remarkable improvement. In posttest 22(73.4%) nurses had good knowledge and 8(26.6%) had average level, likewise in the level of practice 27 nurses had good practice and 3 were average. The paired t-test value of knowledge and practice was 11.9 and 18.2 respectively, which was higher than the table value 0.699 at  $p < 0.05$  hence the structured teaching program was found to be effective in improving the knowledge and practice of the nurses. Also, the cases of IV line associated complications have been reduced to 0-1 cases per month. Applying thrombophob ointment, adequate flushing, and proper removal of IV line on fourth day minimized the incidence of IV line related complications in Apollo First Med Hospital, Chennai. This finding was in relation with a cross sectional study by **Varinder Kaur (2020)** on effectiveness of training programme on IV cannulation therapy among nurses in Maharshi Markandeshwar Medical College Hospital, Haryana revealed that interventional group had 83% of good result than the control group with 54%.<sup>2</sup>

#### V. Conclusion

Peripheral IV access is a common and invasive procedure nurses perform every day in hospital. The nurses' knowledge and practice on care of intravenous line has improved after implementing a structured teaching and hands on training conducted on the same. Hence the cases of IV line associated complications were reduced.

### References

- [1]. Zonobia Qamar et.al, (2018), “A descriptive study to assess the knowledge and practice towards care and maintenance of peripheral intravenous cannulation”, *International Journal of Science and Research (IJSR)*.
- [2]. Kaur Varinder, et.al,(2020), “Effectiveness of a Training Programme on Intravenous Cannulation Therapy: An Interventional Study”, *International Journal of Science and Research (IJSR)*.  
<https://www.researchgate.net/publication/343063800>
- [3]. Bitsika, E., et.al, (2014). Comparative analysis of two venipuncture learning methods on nursing students. *Nurse Education Today* 34(1), 15-18. <https://doi-org.dml.regis.edu/10.1016/j.nedt.2013.03.016>
- [4]. Keleekai, N.L.,et.al, (2016). Improving Nurses’ Peripheral Intravenous Catheter Insertion Knowledge, Confidence, and Skills Using a Simulation-Based Blended Learning Program: A Randomized Trial. *Simulation In Healthcare: Journal Of The Society For Simulation In Healthcare*, 11(6), 376–384. Retrieved from  
<http://dml.regis.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=cmedm&AN=27504890&site=ehost-live&scope=site>
- [5]. Sharma k Suresh,(2018), “Nursing Research And Statistics”, 3<sup>rd</sup> edition, Elsevier publications:Haryana. (pg:410-562).
- [6]. *International Journal of nursing research* [ PankajPunjot et.al,2018]
- [7]. Knowledge and practice towards care and maintenance of PIC by costi -2019 published online 2019 APR 15.
- [8]. Tuffaha, H. W.,et.al,(2014). The epic3 recommendation that clinically indicated replacement of peripheral venous catheters is safe and cost-saving: how much would the NHS save?. *The Journal of hospital infection*, 87(3), 183.
- [9]. Salgueiro-Oliveira,et.al, (2012). Incidence of phlebitis in patients with peripheral intravenous catheters: the influence of some risk factors. *Australian Journal of Advanced Nursing*, The, 30(2), 32
- [10]. Polit, D. (2010). *Statistics and Data Analysis for Nursing Research* (2nd ed.). Upper Saddle River, New Jersey: Pearson Education Inc.

Mr. Jishnu K.S, et. al. “A study to assess the knowledge and practice of nurses on care of peripheral lines.” *IOSR Journal of Nursing and Health Science (IOSR-JNHS)*, 11(02), 2022, pp. 55-59.