

Assess the Practice of Aseptic Techniques on Starting a Peripheral Intravenous Cannula by Staff Nurses at Tertiary Teaching Hospital Puducherry

IrinMetildaRuby.M¹, Malarvizhi. S², Chelliah³

¹Nursing Tutor, Department of Medical Surgical Nursing, VHS M.A Chidambaram College of Nursing, Tharamani, Adayar, Chennai- 600113, India.

²Professor, Assistant Registrar, HOD - Department of Medical Surgical Nursing, College of Nursing, Pondicherry Institute of Medical Sciences, Puducherry.

³Assistant Professor, Department of Medical Surgical Nursing, College of Nursing, Pondicherry Institute of Medical Sciences, Puducherry.

Corresponding Author: Chelliah

ABSTRACT

Introduction: Asepsis is freedom from infection or prevention of contact with microorganisms. Aseptic technique is a set of specific practices and procedures performed with the goal of preventing contamination by pathogens. The effectiveness of infection control practices depends on health care professionals conscientious and consistency in using effective aseptic technique. Aseptic technique is vital in reducing the morbidity and mortality of patients.

Objectives: 1. To assess the practice of aseptic technique on starting a peripheral intravenous cannula. 2. To identify the factors influencing the standard of practice followed in aseptic technique on starting a peripheral intravenous cannula. 3. To associate the level of practice on starting a peripheral intravenous cannula with selected demographic variables.

Materials and method: A descriptive non experimental study was conducted in medical, surgical, ophthalmic and ENT wards of a tertiary teaching hospital at Puducherry. The data was collected by using observational checklist and structured questionnaire among 50 staff nurses; they were selected by using purposive sampling technique.

Results: The finding of the study shown in to regard to level of practice on aseptic technique of starting a peripheral intravenous cannula 60% had unsatisfactory practice and 30% of them had moderately satisfactory practice and 10% had satisfactory level of practice. The factors influencing the practice of starting a peripheral intravenous cannula are lack of time, during emergency situation, non-availability of equipment's, negligence, and inconvenience. There is no statistically significant association between the level of practice of aseptic technique on starting a peripheral intravenous cannula with selected demographic variables of staff nurses.

Conclusion: The study findings revealed that majority of staff nurses had unsatisfactory level of practice in following aseptic techniques on starting a peripheral intravenous cannula. It is concluded that there is a need for reinforcement regarding the steps to be followed for maintaining aseptic techniques on starting a peripheral intravenous cannula among staff nurses.

Keywords: Aseptic techniques, Peripheral intravenous cannula, Staff nurses

INTRODUCTION

Health is transforming with the advancement of technological which is challenging today's health care professionals, in which the role of Intravenous therapy is significant in today's

medicine. The demand of receiving intravenous therapy has increased day to day, to correct metabolic disorders by administering medications, nutritional supplements, solution, blood and their

products. Peripheral intravenous line is most widely used invasive procedure in the hospital. All though being the most widely used procedure it has its own disadvantages.

^[1] The local Complication like phlebitis, thrombophlebitis, bleeding, sepsis, and nerve tendon or ligament injury are the results of inadequate knowledge and practice of health care professionals in starting an intravenous line.^[2]

Aseptic technique is defined as a distinct range of practices and procedures done under strict conditions with the aim of reducing the risk of infection. The aim of aseptic technique is to save the patients from disease causing microorganism and the concept of asepsis to be practiced in all clinical setting^[3]. It includes practices performed just before, during, or after any invasive procedures. Poor adherence to aseptic techniques results in considerable morbidity and mortality. Even in countries with well-established infection control programs, hospital acquired infections (HAI) related to poor compliance with aseptic techniques is an important public health problem^[4].

The conscientiousness and consistency of the health care professionals in using effective aseptic technique is important in infection control practices. Most commonly nosocomial (hospital-acquired) infection is also responsible for longer hospital stay and increased cost for the hospital and patients. Aseptic technique helps to decrease the morbidity and mortality rate associated with pathological infections^[5].

Peripheral intravenous cannulation is the insertion of the vascular access device into a peripheral vein; this procedure needs manual skills, professional competency, knowledge about the anatomy and physiology of vascular system. Intravenous cannula is small hollow device with a catheter which is placed inside a vein and is used more frequently in hospitals ^[6]. Vascular access device related infections in the hospitalized patients are probably a major concern in today's health care. In UK

hospital-acquired infections associated with Catheter related blood stream infection (CRBSI) accounts for about 10 to 20% and are relatively increased with both ICU stay and mortality ^[7]. The incidence of local or bloodstream infection is related to IV (intravenous) therapy. A considerable number of deaths occur due to blood stream infection like every 10th person is suffering from hepatitis which is life threatening. This problem is due to poor practice of IV cannulation.^[6]

There has been an increasing concern among health care professionals about hospital acquired infection. In the national and multi centre studies conducted by WHO, it was identified that the prevalence of hospitalized patients who acquired at least one hospital acquired infection ranged from 3.5% to 12%. This increasing concern in number of health care associated infection has prompted the need for further research in asepsis ^[8]. Intravenous insertion has got an increased chance of getting infection directly into the bloodstream or at the site of cannulation. Peripheral intravenous catheters Associated with local or bloodstream infections are usually low, however due to increased frequency of its usage there are serious complications leading to annual morbidity ^[9]. For most endemic pathogens causing catheter related blood stream infection the primary source is through the insertion site or through the catheter hub. Contamination may be caused as a result of patients' own flora or from healthcare workers' hands during insertion and manipulation during the procedure. These organisms move along the inside and outside lumen of the intravenous catheter (IV) and lodge the (IV) site causing growth of microorganism and progressing it to a systemic and localized infection^[10]. Nurses must possess up to date knowledge while practicing intravenous therapy for safe nursing practice as well as excellent quality of care.

The researcher was interested to find out the level of practice and factors influencing the standard of practice among

staff nurses so that appropriate interventions could be carried out.

OBJECTIVES

1. To assess the practice of aseptic technique on starting a peripheral intravenous cannula.
2. To identify the factors influencing the standard of practice followed in aseptic technique on starting a peripheral intravenous cannula.
3. To associate the level of practice on starting a peripheral intravenous cannula with selected demographic variables.

MATERIALS AND METHODS

Research Approach & Research Design

Quantitative Research Approach and Non experimental Descriptive Research Design was adopted for the study.

Study sample & technique The sample selected for the study was 50 staff nurses working in a tertiary hospital. Sampling technique was purposive sampling technique.

Description of tool: The tool consisted of three parts

1) Demographic variables/ observational checklist/ structured questionnaire

The tool consists of three parts. Part I - consist of socio demographic variables Part-II consist of Observational checklist to assess the practices on aseptic technique on starting a peripheral intravenous cannula Part III-consist of self-administered questionnaire to assess the factors influencing the Practice of aseptic techniques.

Data Collection Procedure and Method

After obtaining formal permission, the purpose of the study were explained by Nursing Superintendent in the group and the group consent (verbal consent) was obtained for the observation. The data Collection was done for a period of one month. Each staff nurse was observed three times by using observational checklist to assess the level of practice on starting a peripheral intravenous cannula After the 3 observations participant information sheet was provided and written consent was obtained from staff nurses.

After that the data related to demographic variables was collected and self-administered questionnaires on factors influencing the standard of practice were administered over a period of 20 minutes for every participant.

Data analysis Descriptive and inferential statistics using SPSS were used to analyse the data.

RESULT

Findings related to Socio-Demographic variables of total sample under study. (Table 1)

Among 50 staff nurses 72% of them were under the age group of 21-24 years, 88% of them were females, 100% of them had completed B.Sc. Nursing, 70% of them were from medical ward, around 64% of them had the experience of 1-3 years and 54% of them were not trained on aseptic technique.

S. No	Demographic variables	Frequency (f)	Percentage (%)
1.	Age (in years)		
	21-24	36	72
	≥25	14	28
2.	Gender		
	Male	6	12
	Female	44	88
3.	Educational qualification		
	B.Sc. Nursing	50	100
4.	Area of work		
	Medical ward	35	70
	Surgical ward	4	8
	Ophthalmic ward	8	16
	ENT ward	3	6
5.	Years of experience		
	<1 year	13	26
	Years	32	64
	>3 years	5	10
6.	Training on aseptic technique		
	Yes	23	46
	No	27	54

Level of practice of aseptic techniques on starting a peripheral intravenous cannula. (Figure 1)

The level of practice on aseptic technique on starting a peripheral intravenous cannula showed that 60% had unsatisfactory level of practice and 30% of them had moderately satisfactory practice and 10% had satisfactory level of practice.

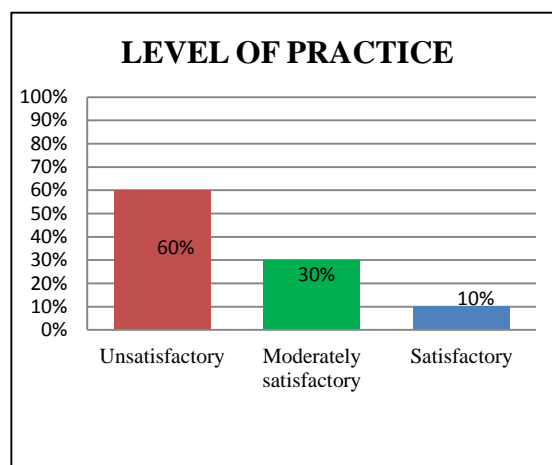


Figure 1 Level of practice on starting a peripheral intravenous cannula n=50

Distribution of staff nurses according to the steps performed while practicing aseptic techniques on starting a peripheral intravenous cannula. (Table 2)

The distribution of staff nurses according to the steps performed while practicing aseptic techniques on starting an

intravenous cannula was incomplete and the factors influencing the aseptic practice of starting a peripheral intravenous cannula are lack of time, during emergency situation, non-availability of equipment's, negligence, and inconvenience.

Table no: 02 Distribution of staff nurses according to the steps performed while practicing aseptic techniques on starting a peripheral intravenous cannula. n=50

S.no	Performance criteria	Yes		No	
		f	%	f	%
1.	Explain the procedure and get verbal consent	46	92	4	8
2	Assemble all the articles needed for the procedure (venflon, tourniquet, antiseptic swab, kidney tray, tape, sticker to label)	44	88	6	12
3	Selection of appropriate cannula size	46	92	4	8
4	Perform hand hygiene before the procedure	44	88	6	12
5	Wear clean gloves	27	54	23	46
6	Apply tourniquet firmly 4-5 inches above the site for less than 1 minute	45	90	5	10
7	Clean the skin at the site of entry with antiseptic swab in circular motion from center to periphery and should be dried for 30 second.	40	80	10	20
8	Check for any damage in cannula	46	92	4	8
9	Insert the needle bevel at 5-10 degree angle directly in line with the vein	45	90	5	10
10	Withdraw the needle and check for backflow of blood	50	100	0	-
11	Release the tourniquet after placing the IV cannula	50	100	0	-
12	Handle the bevel without any contamination	48	96	2	4
13	Flush IV cannula after insertion with normal saline	36	72	14	28
14	Close the IV cannula with the adapter	50	100	0	-
15	Apply primifix	50	100	0	-
16	Label the date and time of insertion	44	88	6	12
17	Dispose the waste in appropriate bin	50	100	0	-
18	Replace the articles	49	98	1	2
19	Perform hand hygiene after the procedure	46	92	4	8
20	Do documentation of the procedure	37	74	13	26

Association between the levels of practice of aseptic techniques with selected demographic variables. (Table 03)

There is no statistical significant association between the level of practice of

aseptic technique on starting a peripheral intravenous cannula with age, gender, experience, area of work, and training

Table no: 03 Association between level of practice and demographic variables n=50						
S.no	Demographic variables	Level of practice			Fisher's exact test	p value
		Unsatisfactory (<75%)	Moderately satisfactory (75- 89%)	Satisfactory (90 -100 %)		
1.	Age (in years)					
	21-24	23	9	4	1.546	0.510 NS
	>25	7	6	1		
2.	Gender					
	Male	6	0	0	3.588	0.159 NS
	Female	24	15	5		
3.	Experience					
	<1 year	10	1	2	6.217	0.138 NS
	1-3 years	18	12	2		
	>3 years	2	2	1		
4.	Area of work					
	Medical ward	23	8	4	6.164	0.327 NS
	Surgical ward	1	2	1		
	Ophthalmic ward	5	3	0		
	ENT ward	1	2	0		
5.	Training on aseptic technique					
	Yes	12	8	3	1.235	0.632 NS
	No	18	7	2		

DISCUSSION

In the present study, among the study participants of 50 staff nurses, 60% had unsatisfactory practice and 30% of them had moderately satisfactory practice and 10% had satisfactory level of practice on aseptic technique of starting a peripheral intravenous cannula.

A similar descriptive cross sectional study done to assess the level of knowledge and practice on (IV) cannulation among staff nurses of tertiary care hospital showed that there is no adequate knowledge among nurses in all aspect of IV cannulation. About 2.67% respondents had excellent 12% had good 73.3% had average and 12% had poor practice of IV cannulation.

The factors influencing the aseptic practice of starting a peripheral intravenous cannula according to the steps performed are lack of time, during emergency situation, non-availability of equipment's negligence, and inconvenience.

Fisher exact test was used to find the association between the level of practice of aseptic technique on starting a peripheral intravenous cannula with selected demographic variables such as age, gender, educational qualification, area of work, Years of experience and training on aseptic technique and found there was no statistically significant association.

CONCLUSION

The current study assessed the practice of aseptic technique on starting a peripheral intravenous cannula among staff nurses with the help of observational checklist and self-administered questionnaire. The study revealed that majority of the study participants 60% of them had unsatisfactory level of practice in following the aseptic techniques on starting a peripheral intravenous cannula. The study concludes that there is an important need for reinforcement among staff nurses in following the aseptic technique while starting a peripheral intravenous cannula and continuing nursing education programs and skill training can be arranged on this topic.

REFERENCES

- Hossain Anwar Md, ArifHasanImamulMd, HaqueMonoarul Md. Assessment of the level of knowledge and practice on intravenous cannulation among staff nurses of selected tertiary care hospital in Dhaka city. MOJ public health. 2016; 4(5): 156-159. <https://medcraveonline.com>> MOJPH
- Wikipedia. Skin care analysis, healthcares.net,2007;URL:<https://en.wikipedia.org/wiki/human-skin>.
- Jose Joel. A study to assess the effectiveness of planned teaching programme regarding the importance of aseptic technique among final year BSc nursing students in a selected nursing college at Tumkur: Rajiv Gandhi

- University of health sciences, Bangalore; 2012. www.rugh.ac.in/cdc/onlinecdc/uploads/05-N052-28960-doc.
4. Sudarshan. A study to assess the effectiveness of self-instructional module (SIM) on aseptic wound dressing practices among staff nurses in selected hospital at Bidar: Rajiv Gandhi University of health sciences, Bangalore; 2010. www.rguhs.ac.in/cdc/onlinecdc/uploads/05-N099-25240.doc.
 5. Singh Navjyot, Rani Manisha, Kumara Priyanka. Assessment of knowledge of staff nurses regarding aseptic techniques at selected hospital a descriptive survey study. *IJHSR*. 2016; 6(9): 290-294. <https://www.researchgate.net/.../303150698>
 6. QamarZonabia, Afzal Muhammad, KousarRobina, Wqas Ali, Gilani Amir Syed. Assess nurses knowledge and practice towards care and maintenance of peripheral intravenous cannulation in services hospital, Lahore, Pakistan. *SJMPS*. 2017; 3(6B): 608-614. scholarsmepub.com/wpcontent/uploads/2017/07/SJMPS-36B08-614.pdf.
 7. GahlotRupam, Nigam Chaitanya, Kumar Vikas, YadarGhanshyam, AnupurhaShamp. Catheter related blood stream infection. *IJCIIS*. 2014; 4(2)162-167. <https://www.ijcis.org/text.asp?2014/4/2/162/134184>.
 8. BofahAdu-tutu Josephine, lay alexander albert. Peripheral intravenous therapy: focus on asepsis. HelsinkiMetropolia University of Applied Sciences.2012. <https://www.theseus.fi/bitstream/handle/10024/42656/bofah-josephine.pdf>
 9. Franklin Dean Bryony, DeelchandVashist, Cooke Matthew, Holmes Alison, Vincent Charles. The safe insertion of peripheral intravenous catheter a mixed methods descriptive study of the availability of the equipment needed. *ARIC*. 2012; 1(15). <https://www.ncbi.nlm.nih.gov/PMC/articles/pmc3508918>
 10. Schmid Wellman Marlene. Preventing intravenous catheter associated infections: an update. *Infection Control Today*. 2001. <https://www.infectioncontrolday.com/epidemiology-surveillance/preventing-intravenous-catheter-associated-infections-anupdate>.
- How to cite this article: IrinMetildaRuby.M , Malarvizhi. S, Chelliah. Assess the practice of aseptic techniques on starting a peripheral intravenous cannula by staff nurses at Tertiary Teaching Hospital Puducherry. *Int J Health Sci Res*. 2020; 10(11):198-203.
