

Original Research Article

Assess Nurses Knowledge and Practices towards Care and Maintenance of Peripheral Intravenous Cannulation in Services Hospital Lahore, Pakistan

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Abstract: The current study assesses the knowledge and practices towards maintenance and care of the peripheral intravenous cannulation among the nurses of public hospitals of Lahore, Pakistan. The data was collected from 240 nurses of Services hospital Lahore, Pakistan through convenient sampling. The results of the current study depict that nurses of Services hospital, Lahore, Pakistan have good knowledge regarding care and IV cannula but lack the practices. Therefore, healthcare provider should train the nurses to improve the practices in the public hospitals especially. SPSS 21 used to analyze the data. Limitations and recommendations are given in the end of this study.

Keywords: Knowledge, Nurses, Practice, Peripheral intravenous (I/V) cannulation

INTRODUCTION

This study is to assess the knowledge and practices of nurses regarding care and maintenance of intravenous cannula. Peripheral venous Cannulation is the insertion of a vascular access device into a peripheral vein. This procedure needs manual skills, professional competency, knowledge about the anatomy and physiology of vascular system. Intravenous cannulas are small hollow advance device over a needle which penetrates into vein and it is used more frequently for administration of different drugs, fluids, blood, nutrition, for sampling and other purposes [1].

However, the incidences of local or blood stream infections are related to IV therapy. A considerable number of deaths occur due to blood stream infections like every 10th person is suffering from one type of hepatitis which is life threatening. This problem occurs due to the poor practices of intravenous cannulation or therapy [2]. Moreover, may cause the universal infection which can be mechanical or infectious like Occlusion, thrombosis, dislodgment, infiltration, leakage, phlebitis and scar formation are the mechanical complication while fungal and bacterial sepsis are included in infectious complication [3].

Peripheral intravenous cannulation is the most common source of infection due to the migration of skin flora on the site of insertion into the cutaneous tract of

cannula with outer surface of catheter [4]. Due to high risk of infection and embolism, superficial veins of the lower limbs are avoided. If the cannula is placed in the lower limbs it may resisted soon [5].

Blood stream infections are also associated with peripheral or intravenous catheters through contamination of microorganisms on the venous puncture site. Organisms include staphylococcus epidermidis, staphylococcus aureus, candida species and enterococci which introduced within contaminated infusion fluids [6].

In today's world of health care, nurses must possess up to date knowledge while practicing intravenous therapy for safe nursing practice as well as excellent quality of care. Nurses are responsible for provision of safe, patient centered and effective care to the patients. To minimize the severity of complications, puncture site must be constantly monitored for early identification of signs. In addition, hands should be decontaminated properly before gathering equipment, palpation of the veins, cannulation and placing gloves on hand, repeat it after removing gloves and before and after the contact with patients [7]. Likewise, American National Guidelines emphasizes on the cleansing of the port as it is important for the patency of I/V line [4]. However, documentation plays a vital role in the generation of real time data and the improvement of

staff abidance with care guidelines that helps to provide the quality care with peripheral venous cannula [1].

Furthermore, majority of nurses know how to care and maintain peripheral intravenous line but still there is some gap in this basic nursing skill. The aim of this study is to determine and assess the knowledge and practice of nurses towards care and maintenance of peripheral intravenous line among the public hospitals of Lahore, Pakistan.

Problem Statement

Peripheral intravenous cannulation related infections are very common problem among hospitalized patients. Such infection is dangerous for the patients and decreases the quality of care. The study noted that intravenous infection rate is 20% in Pakistan [8]. Intravenous associated infections are present in different health care settings but have not enough baseline/electronic data available. Almost same condition is in every public hospital of Lahore, Pakistan. Therefore, it should be investigated among the public hospitals especially, so that the infection rate can be controlled and solution for this high rate of IV-line infection can be controlled.

Objectives

- To assess the nurse's knowledge towards maintenance and care of the peripheral I/V Cannulation.
- To determine the practices of nurses regarding insertion, removing and care of I/V Cannulation.

Study Significance

The following study will help to reveal the understanding and practices of nurses regarding care and maintenance of peripheral intravenous cannulation. Factors would be identified might lead to practice modification through education, in-service training, and equipment / procedure changes according to the standards for quality of care. This study would help to control the efficiency of the interventions and prevent patients from trouble, reduce hospital stay and quality of care will be improved. This study will be helpful for the authorities of the hospital to increase the knowledge regarding infections related to peripheral intravenous cannulations.

Literature Review

Peripheral intravenous cannulation is an invasive procedure in which skin is punctured with a needle of short temporary device [9]. Intravenous cannulation and therapy are always associated with infections either skin around the site of insertion and may need the control measures [10]. The study noted that traumatic phlebitis develops when catheter inserted on the high mobility areas [11].

The study noted that 53.8% nurses had poor knowledge, 39.3% average and 5.9% had good knowledge about the indications and contraindications of I/V lines in Dhaka [10]. On the other hand, practices were excellent among 2.67% nurses and 12% had poor practices which is an alarming sign for health care organizations and health care providers.

The study noted the factors which may be helpful to reduce the phlebitis like diameter of cannula can affect the complications and awareness of nurses has significant importance for the maintenance of peripheral intravenous cannulation [12]. In addition, necessary documentation plays a key role for safe handling of patients with peripheral venous catheters [13]. Priority should be given to the education of nurses on proper documentation for maintenance of intravenous lines.

The study accessed the knowledge and practices among nurses of Celal Bayar University Hospital regarding patients with intravenous catheter and phlebitis interventions [14]. The result depicts that nurses have enough knowledge but their practices were comparatively low and 67.24% patients developed signs of phlebitis that indicate the poor practices [14].

Furthermore, peripheral intravenous catheterization has numerous effects on patients in health care that might lead to various complications like thrombophlebitis or sepsis. Several standard guidelines developed to assist nurses for care of peripheral intravenous lines. The study determines the nurse's bonding to national and local guidelines on peripheral intravenous catheters and results depict that nurses partially follow the national and local guidelines. [15].

The study results show that 62.7% patients had colony and the amount of time influences colonization with risk of infection through the nursing care provided to the patients [15]. Moreover, there is lack of standardized nursing practices and uniformity in handling the intravenous Cannulation [15].

After reviewing the literature, I/V therapy is an integral part of job of health care providers. Standard aseptic measures and correct practices of health care professionals according to the standard guidelines can reduce the risk of infection related to intravenous therapy.

METHODOLOGY

Study Design

This study is of descriptive study design. The adopted questionnaire was distributed to 240 nurses of Services hospital Lahore, Pakistan. The questionnaire consists of study purpose and consent as well. The questionnaire composed three Section A (demographic

information) and section B was about section C questions. All Head Nurses, paramedic staff, student nurses who are not participating in delivering medication system and other health care professionals were excluded. The data security was ensured to the study participants. SPSS 21 was used to analyze the data.

RESULTS

Demographic Information

Gender of the subject

Table-1.1: Gender of the subject

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	14	5.8	5.8	5.8
	female	226	94.2	94.2	100.0
	Total	240	100.0	100.0	

Table no.1,1 shows the frequency distribution of gender of the study participants. the results show that

94.2% (n=226) were female nurses while 5.8% (n=14) male nurses participated.

Marital status

Table-1.2: Marital status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Married	83	34.6	34.6	34.6
	Unmarried	157	65.4	65.4	100.0
	Total	240	100.0	100.0	

Table 1.2 show that show that 65.4% (n=157) study participant were unmarried nurses and 34.6% (n=83) married were married.

Age of the subject

Table-1. 3: Age of the subject

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	21-25yrs	81	33.8	33.8	33.8
	26-30yrs	105	43.8	43.8	77.5
	31-35yrs	33	13.8	13.8	91.3
	36-40yrs or above	21	8.8	8.8	100.0
	Total	240	100.0	100.0	

Table no. 1.3 shows the participant's age. The results show that 43.8% (n=105) were young nurses under age group of 26-30years, 33.8% (n=81) were in

21-25 years, 13.8% (33) nurses were from age group 31-35 years and only 8.8% (n=21) nurses were above 36-40years and above group.

Qualification

Table-1.4: Qualification

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Diploma in G nursing and midwifery	116	48.3	48.3	48.3
	Specialization	62	25.8	25.8	74.2
	Post RN	58	24.2	24.2	98.3
	Others	4	1.7	1.7	100.0
	Total	240	100.0	100.0	

Table no.1.4 show the qualification level of the study participants. The results show that 48.3% (n=116)

nurses did just diploma holder, Specialized nurses were 25.83% (n=62) and 24.2% (n=58) did Post RN

Stay in Organization**Table-1.5: Stay in Organization**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	< 1 year	30	12.5	12.5	12.5
	1-5 yrs	119	49.6	49.6	62.1
	6-10yrs	63	26.3	26.3	88.3
	Above 10yrs	28	11.7	11.7	100.0
	Total	240	100.0	100.0	

Table 1.5 show the job experience of nurses participated. The results show that 12.5% (n=30) respondents have less than 1 year of experience, 49.6%

(n=119) have 1-5 years of experience, 28.2% (n=63) nurses had 6-10years of experience and only 11.7% (n=28) nurses had above 10 years of experience.

Knowledge Towards Care and Maintenance of Peripheral IV Cannula.**Table- 2.1: Knowledge towards Care and Maintenance of Peripheral IV Cannula.**

Sr. #	Variables	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	S. D
1	The cannula gauge 14G, 16G, 18G and 20G are suitable to use for peripheral intravenous cannulation.	n=10 4.2%	n=28 11.7%	n=43 17.9%	n=113 47.1%	n=46 19.2%	3.65	1.048
2	Veins use for intravenous cannulation normally located at dorsal) and ventral surface of the upper extremities right and left hand/arm (metacarpal, cephalic and basilic)	n=12 5.0%	n=24 10.0%	n=47 19.6%	n=121 50.4%	n=36 15.0%	3.60	1.022
3	Peripheral IV cannula must be removed every 12-72 hours from insertion time.	n=4 1.7%	n=6 2.5%	n=48 20.0%	n=102 42.5%	n=80 33.3%	4.03	.886
4	Based on Universal Infection Control Guidelines, IV cannula can be used 48-72 hours if no signs and symptoms of complication	n=6 2.5%	n=14 5.8%	n=38 15.8%	n=134 55.8%	n=48 20.0%	3.85	.893
5	Phlebitis is the most identifiable infection related to IV cannulation.	n=4 1.7%	n=10 4.2%	n=21 8.8%	n=120 50.0%	n=58 35.4%	4.13	.862
6	The environment situation (e.g. cleanliness) will influent the risk of infection related to IV cannulation.	n=5 2.1%	n=17 7.1%	n=35 14.6%	n=133 55.4%	n=50 20.8%	3.86	.899
7	Hand hygiene before procedure IV insertion is important in order to prevent infection.	n=5 2.1%	n=3 1.3%	n=28 11.7%	n=98 40.8%	n=106 44.2%	4.24	.862
8	Maintaining aseptic technique only during insertion of IV cannula will help to prevent infection occur	n=12 5.0%	n=20 8.3%	n=36 15.0%	n=114 47.5%	n=58 24.2%	3.78	1.063
9	Wearing non-sterile gloves during insertion of IV cannula are advisable.	n=54 22.5%	n=29 12.1%	n=32 13.3%	n=92 38.3%	n=33 13.8%	3.09	1.398
10	Skin preparations at insertion site are require before IV cannula inserted.	n=10 4.2%	n=15 6.3%	n=35 14.6%	n=119 49.6%	n=61 25.4%	3.86	1.005
11	Increase attempts for cannulation will increase the risk of infection.	n=9 3.8%	n=10 4.2%	n=22 9.2%	n=142 59.2%	n=57 23.8%	3.95	.913
12	Using transparent dressing will help to recognize early signs and symptoms of infection	n=8 3.3%	n=7 2.9	n=52 21.7	n=110 45.8	n=63 26.3%	3.89	.942
13	Removing IV cannula immediately if not in use, will help to reduce risk of infection occur.	n=3 1.3%	n=7 2.9	n=44 18.3	n=117 48.8	n=69 28.8%	4.01	.838
14	Giving intravenous therapy will increase	n=10		n=54	n=126	n=34	3.66	.946

	risk of infection through peripheral IV catheter.	4.2%	n=16 6.7%	22.5%	52.5%	14.2%		
15	Patient educations on how to care IV cannula is important as it do help to reduce risk of infection.	n=4 1.7%	n=7 2.9%	n=31 12.9%	n=130 54.2%	n=68 28.3%	4.05	.825

Table 2.1 show the results of the nurses' knowledge care and maintenance of peripheral IV cannula. In table 2.1, 15 question analyzes the nurses' knowledge and it depicts that majority of the nurses

were agree and strongly agree regarding the questions of knowledge which means that nurses of Services hospital have knowledge regarding care and peripheral IV cannula safe usage.

Nurses' Practices towards Care and Maintenance of Peripheral IV Cannulation

Table-3.1: Nurses Practices towards Care and Maintenance of Peripheral IV Cannulation.

Sr. #	Practice Variables	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	S. D
1	I always change IV cannula after 72 hours inserted.	n=38 15.8%	n=43 17.9%	n=29 12.9%	n=145 60.4%	N=100 41.7%	3.17	1.307
2	When I saw there is a sign of phlebitis I immediately change the IV cannula to non-affected part.	n=25 10.4%	n=34 14.2%	n=22 9.2%	n=98 40.8%	n=61 25.4%	3.57	1.29
3	I always use transparent dressing when securing IV cannula.	n=33 13.8%	n=57 23.8%	n=37 15.4%	n=81 33.8%	n=32 13.3%	3.09	.961
4	I always write date, time, site, size, due date change and name of person cannulated	n=37 15.4%	n=56 23.3%	n=28 11.7%	n=70 29.4%	n=49 20.4%	3.16	.905
5	I use administration set for IV cannula within 72 hours.	n=18 7.5%	n=63 26.3%	n=35 14.6%	n=77 32.1%	n=47 19.6%	3.30	.894
6	I aware of complications of IV cannulation for instance infiltration, phlebitis and extravasation	n=7 2.9%	n=37 15.4%	n=29 12.1%	n=104 44.3%	n=63 30.0%	3.75	.835
7	I always maintain aseptic technique during preparing, inserting and removing of IV cannula.	n=8 3.3%	n=27 11.4%	n=37 15.4%	n=104 49.3%	n=64 26.7%	3.79	.818
8	I always change the dressing when it wet or dislodge.	n=11 4.6%	n=34 14.2%	n=34 14.2%	n=99 41.3%	n=62 25.8%	3.70	.863
9	I always educate my patient how to care the IV cannula.	n=11 4.6%	n=36 15%	n=20 8.3%	n=119 49.6%	n=54 22.5%	3.55	.835
10	I always educate my patient how to recognize the signs and symptoms of IV cannulation infection.	n=13 5.4%	n=42 17.5%	n=40 16.7%	n=93 38.8%	n=52 21.7%	3.75	.868
11	I aware the important of hand hygiene before IV cannulation being carried out.	n=11 4.6%	n=33 13.8%	n=29 12.1%	n=99 41.3%	n=68 28.3%	3.69	.819
12	I aware the important of doing skin preparation before the procedure insertion of IV cannula.	n=14 5.8%	n=21 8.8%	n=44 13.3%	n=108 53.3%	n=53 22.55%	3.83	.860
13	I aware the factors that influence the risk of infection occur.	n=33 13.8%	n=57 23.8%	n=37 15.4%	n=81 33.8%	n=32 13.3%	3.09	.810
14	I always follow guidelines that given by my management when carried out IV cannulation.	n=37 15.4%	n=56 23.3%	n=28 11.7%	n=70 29.4%	n=49 20.4%	3.16	.898
15	I am confident enough to carry out this procedure (IV cannulation) because I have enough knowledge and experience.	n=5 2.1%	n=79 32.9%	n=30 12.5%	n=121 50.4%	n=5 2.1%	4.10	.847

Table 3.1 shows the responses of the study participants regarding practices of IV cannula. The results in table 3.1 depicts the respondents' practices regarding IV cannula and its safe usage. The results show that on average level nurses follow the protocols and lack in the practices. Therefore, it means that nurses practices are lacking at moderate level at the Services hospital, Lahore, Pakistan.

DISCUSSION AND CONCLUSION

The current study examines the knowledge and practices regarding caring and maintaining peripheral intravenous cannulation among the nurses of Services hospital, Lahore, Pakistan. This study found that nurses have good knowledge regarding IV cannula protocols. The results show that nurses are not practicing appropriately. Similarly, nurses offering pathetic practices in maintaining aseptic technique while performing this procedure. However, nurses' knowledge and practice about care and maintenance of IV cannulation is good but still the practices are not according the standard protocols.

In addition, health care providers are accountable for safe and quality care delivery to the patients, so they should be well resourced and enough trained nursing staff. Furthermore, public hospital administration should emphasize on training of the nurses to fulfil the practices protocols, so that the quality care can be provided.

Limitation and Recommendation

This review has following limitations and recommendations:

- This study is undertaken only in the Services hospital due to limited time. Further studies should consider the public and private hospital of different regions as well.
- This study analyzes through the quantitative design only, however, qualitative study design should also be examined.
- The studies should also examine the factors which may affect the nurses' knowledge and practices.
- Evidence base concerning I/V therapy need to be reviewed and strengthened by further research because it is still weak in many clinical areas.

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