KNOWLEDGE PRACTICE AND ATTITUDE OF NURSES RELATED TO PREVENTION COMPLICATIONS OF THE IV CANNULATION AT IMAM ALI HOSPITAL (KAP STUDY)

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Peripheral intravenous cannulation is one of the operations that junior nurse professionals perform the most frequently. Given this, it is crucial to comprehend the peripheral intravenous cannulation process (11) Intravenous cannulation has a significant risk of complications and may be challenging. The cannula is accompanied by problems and effects, such as superficial phlebitis and infiltration, that worsen the pain. It may cause further delays in treatment and transfer, possibly leading to unfavorable patient outcomes if the cannulation fails or is ignored (2)(5) method: The study aimed to assess nurses' knowledge, attitudes, and practice in avoiding problems following cannulation. 82 nurses who worked at Baghdad's Imam Ali Hospital between December 2022 and February 2023 were chosen as an acceptable sample. Data was gathered using a questionnaire form. Results: the great majority of participant's females (73.2), while the highest percentage was for the age group 36 and over, with 35.4, regarding the level of education, it was for the diploma certificate, 37.8 regarding years of work experience, and category 1-5 years A by 26.9. another side showed a medium association with knowledge and practices with a value of .513, Followed by a strong correlation among knowledge and attitudes with a value of 637. finally, the lowest value was weak between practices and attitude, with a value of 392. All coefficients are statistically significant at less than .005. there is a statistically significant association between the variables of age, gender, educational level, and years of experience and their knowledge, practice, and attitudes, with a significant level of less than 0.05. the Nurses with university education have a good level of knowledge, always application, and a positive attitude to prevent complications from cannulation. Recommendation: Implementing an educational program for nurses on the prevention and maintenance of cannulation. Taking into account the stimulating bumps and activating the role of the continuing education unit in hospitals to follow up on scientific developments.

INTRODUCTION:

A peripheral intravenous cannula is one of the hospital nurse's most critical responsibilities. The most common ways to provide fluids into the circulation for chemotherapy and blood transfusions or their derivatives, whether a patient is in the emergency unit or stays for treatment, are intravenous therapy and fluid administration. [1] [10]

Cannulation has a significant risk of complications and may be challenging. And accompanied by problems and effects, such as superficial phlebitis and infiltration, that worsen the pain and may cause further delays in treatment and transfer, possibly leading to unfavorable patient outcomes if the cannulation fails or is ignored. [2][5]

Only competent nurses who have completed the nursing procedure program or medical officers are permitted to perform peripheral cannulation. But a transparent, sanitized dressing ought to be used to secure the cannula. It would help if you didn't tape over the insertion site with non-sterile tape. [13] The dressing ought to permit viewing of the injection site. Reduce the danger of extravasation

and associated complications by securing the device. **(4) (5)** Depending on the kind and dosage of the medicine, certain problems that come with intravenous injections resolve over time without medical attention. The most frequent issues are superficial phlebitis and infiltration, including thrombosis and discomfort (pain perception differs from person to person depending on psychological, mental, and physical health). **(3)(6)(9)**

Infiltration: The medicinal substance leaks outside the vein, causing hurt, and the skin is whiter and stiffer than the surrounding skin. Additionally, several medications have various adverse effects when accidentally injected into tissue, a problem that typically results from a need for a more scientific understanding of intravenous administration. **(7) (12) (15) (18) (18) (5)** The nurse can prevent leakage by making sure the needle tip is within the vein; to do this, she draws blood from the patient to turn the syringe red, removes the tooth from the vein, and then administers the injection. **(16) (17)** To confirm the needle is inside the vein before injecting medications, blood must be collected again in cases of abrupt discomfort where there is a chance the needle will have come out of the bloodstream. Because it is possible to move the cannula and treat the area with cold compresses and topical anti-inflammatory drugs, early detection is essential for minimizing difficulties· **(8)**

Phlebitis: It is a common comorbidity brought on by local trauma to the vein, typically during the insertion of a catheter; however, it is more likely in individuals who have had multiple cannulations in a succession. It denotes bacterial-induced inflammation and improper sterilizing techniques. It is characterized by burning or pain along the vein. **(8) (9) (11)** Therefore, complete care must be taken of the cannula to avoid infection by cleaning the area around it each time it is injected. If there is pain, redness, swelling, or other symptoms in the place where the cannula is located, the cannula should be removed; however, to ensure that there are no adverse effects on the vein, the cannula should be removed within 48–72 hours of its placement· **(11)** The time and date of fixing the cannula must be documented, and it is preferable to use a transparent adhesive to monitor the marks and position at the site of fixing the cannula· **(12) (14)** The knowledge, practices, and attitudes of participants about patient cannulation issues are investigated in this study. In conclusion, nurses should always: Make that the location of the intravenous cannula is safe. Verify the visibility of the insertion location· **(15)**

OBJECTIVES OF THE STUDY:
1-Determine nurses' knowledge, practices, and attitudes about preventing intravenous cannulation complications.

2-Identify the association between demographic information and the axes of the study

RESEARCH QUESTIONS
1-What is the knowledge of nurses' practices and attitudes about preventing intravenous cannula complications?
2-Is there a relationship between demographic variables and nurses' knowledge, methods, and attitudes related to preventing cannulation complications?

SUBJECTS & METHODS:
Research design: A descriptive study was conducted at Imam Ali General Hospital in Baghdad to achieve the study's objectives. A random sample of 82 nurses from the morning shift was selected. The duration of the study is from April 2022 to January 2023.

TOOL OF THE STUDY: A self-administrating survey was developed by the researcher to meet the study's objective after an extensive review of previous studies related to the current research using Google Scholar and PubMed. The questionnaire is divided into two sections: first, about demographic data (age, gender, level of education, etc.), and second, about content, along three axes: axis one consists of 15 questions to assess knowledge. axis two to evaluate practice consists of 15 questions. And three related estimating nurses' attitudes toward cannula complications prevention with five items. The researcher codes the participants' answers to the knowledge question as (accurate 2) (0 false), and (do not know 1). Question-related practice is (3 consistently applied), (2 sometimes), and (1 never. The third axis of coding was (3 yes), (2 sometimes), and (1 no). **(10) (15)**

VALIDITY
The questionnaire was reviewed by three experts who are academics and nursing professionals at Imam Ali Hospital. The stability of the study tool was measured using (Cronbach's Alpha) equation on a survey sample that consisted of 10 participants who were excluded from the total study sample. The total output of 35 items was 0.846. indicates that the study tool has high stability and can be relied upon in the current study, according to Nanley.

STATISTICAL ANALYSIS: The variables' descriptive analysis (frequencies, percentages, and means) was discovered, and the inferential analysis (chi-squared test) was done to determine the link between the variables and the questionnaire's axes. A P value of 0.05 or less is considered statistically significant for each test. the knowledge score is recorded as 0–1 low, 1.1–2 passes, and 2.1–3 high levels of knowledge by the researcher.

ETHICAL CONSIDERATIONS
After explaining the study's goals and the participants' freedom to participate and assuring them that all

information provided would be kept secret and used only for research, the appropriate departments approved the paper's conduct.

RESULTS:

Table (1): distribution Percentage of the socio-demographic data related to the nurse's participants (n=82)

Variables	Items	F.	%
Gender	Male	22	26.8
	Female	60	73.2
Age	21-25	17	20.7
	26-30	20	24.4
	31-35	16	19.5
	36-and over	29	35.4
Level of education	High school	28	34.1
	Diploma	31	37.8
	Bachelor'	20	24.4
	Master's	3	3.7
Experiences (Years)	< 1	10	12.2
	1-5	22	26.9
	6-10	22	26.7
	> 10	28	34.1
Training courses	Yes	53	64.6
	No	29	35.4

Table (2): distribution of the participant's knowledge answers about the prevention of cannula (n=82)

Questions knowledge	True		Fuels		Don't know		Mean	SD	Level
	F	%	F	%	F	%			
An area-specific, minor inflammation is referred to as superficial phlebitis.	35	42.7	27	32.9	20	24.4	1.098	.8694	L
When a contaminated cannula is used, phlebitis develops.	72	87.8	1	1.2	9	11	1.866	.3772	H
Certain medications and very acidic beverages may irritate the veins..	32	39.0	24	29.3	26	31.7	1.092	.8257	L

	F	%	F	%	F	%	Mean	Std	
Phlebitis risk is enhanced when a cannula is left in place for more than 72 hours.	55	67.1	17	20.7	10	12.2	1.463	.8194	H
Phlebitis and vein infiltration are serious conditions that can result in blood clots and endanger the patient's life.	47	57.3	21	25.6	14	17.1	1.317	.8589	H
Infiltration is reduced by using the right size cannula for the patient.	50	61.0	3	3.7	29	35.4	1.573	.5672	H
Infiltration results from the rapid administration of intravenous fluids.	49	59.8	15	18.3	18	22.0	1.415	.7849	H
selecting the right vein importins to avoid complications	56	68.3	16	19.5	10	12.2	1.488	.8050	H
Infiltration and phlebitis might result from failed efforts.	58	70.7	10	12.2	14	17.1	1.585	.7019	H
Educating the patient on the signs of phlebitis and infiltration can reduce the risks	54	65.9	9	11.0	19	23.2	1.549	.6877	H
cannula risk can be decreased by hand washing	68	82.9	5	6.1	9	11.0	1.768	.5511	H
Infiltration is a fluid outside the vein.	43	52.4	31	37.8	8	9.8	1.146	.9444	L
Using gloves maybe reduces the incidence of phlebitis	53	64.6	8	9.8	21	25.6	1.549	.6695	H
Sterilization of the skin site where the cannula is installed with 70% alcohol prevents infection.	55	67.1	6	7.3	21	25.6	1.598	.6258	H
Phlebitis and infiltration are easier to detect in the early stages when the cannula is fixed with clear adhesive tape.	37	45.1	41	50.0	4	4.9	.951	.9801	L
weighted Mean							1.4309		
Std							35342.		

L=low knowledge H=high knowledge (0-1.1=low, 1.2-2good)

Table (3): distribution of the participants of practice answers about prevention complications of cannula (n=82)

Question of Practice	Always Applied		Sometimes Applied		Never Applied		Mean	Std	assess
	F	%	F	%	F	%			
Observe the site of the cannula first 10 minutes	53	64.6	26	31.7	3	3.7	2.610	.5612	A
If there are any indications of infection or infiltration, remove the IV cannula very away.	56	68.3	19	23.2	7	8.5	2.5976	.6452	A
Tornica location 10 cm above the vein	53	64.6	24	29.3	5	6.1	2.585	.6076	A
Use the appropriate cannula for the patient	52	63.4	23	28.0	7	8.5	2.549	.6508	A
Use an alcohol hand gel	36	43.9	40	48.8	6	7.3	2.366	.6189	A
Push normal saline into the cannula to make sure installed correctly.	44	53.7	21	25.6	17	20.7	2.329	.8021	A

Used Alcohol to sterilize the location of the cannula in one direction.	43	52.4	19	23.2	20	24.4	2.280	.8355	S
When the tape gets wet, replace it.	21	25.6	57	69.5	4	4.9	2.207	.5149	S
Inform the patient about the symptoms and indications of infiltration or phlebitis.	36	43.9	27	32.9	19	23.2	2.207	.7972	S
Clear tape is used to fix the cannula.	23	28.0	45	54.9	14	17.1	2.110	.6668	S
Pre- and post-cannulation hand washing	11	13.4	63	76.8	8	9.8	2.037	.4829	S
Do an antibiotic allergy test	31	37.8	22	26.8	29	35.4	2.024	.8603	S
Write the date and time on the site cannula	18	22.0	47	57.3	17	20.7	2.012	.6572	S
Cannulation's ideal cephalic and cubital positions	17	20.7	38	46.3	27	32.9	1.878	.7267	S
Change or remove the cannula every 72 hours from the date of installation	11	13.4	48	58.5	23	28.0	1.854	.6309	S
weighted Mean							2.2504		
Std							.34324		

S=sometime A=always (2.34-3 Always, 1.67-2.33 sometimes, 1-1.66 never

Table (4): distribution of the participants of attitude answer about the prevention of cannula (n=82)

Attitude	Yes		No		Sometime		Mean	Std	Level
	F	%	F	%	F	%			
Cane Early detection of infiltration	50	61.0	6	7.3	26	31.7	2.537	.6324	P
I can distinguish between a vein and an artery	40	48.8	18	22.0	24	29.3	2.268	.8020	p
I can diagnose superficial phlebitis	38	46.3	15	18.3	29	35.4	2.280	.7581	P
I can choose the appropriate vein	63	76.8	10	12.2	9	11.0	2.646	.6916	P
I want to have a cannula installed	51	62.2	19	23.2	12	14.6	2.390	.8426	P
Mean score							2.7073		
Std							.71125		

p=positive, (1-1.5=negative,1.6-2=positive)

Table (5) Chi-square association between demographic data and KAP participants of the study (n=82)

Items		Knowledge Score				Score practice				Score attitude		
		Poor	pass	Good	X^2 P	A	S	N	X^2 P	P	N	X2 P
		F	F	F		F	F	F		F	F	
gender	Male	0	9	13	**00** **.2**	7	15	0	**99** **.1**	22	0	**.01** **7**
	Female	23	19	18		22	35	3		48	12	
Age	25-21	13	4	0	**00** **.0**	4	12	1	**15** **.3**	7	10	**.03** **9**
	30-26	6	7	7		8	10	2		19	1	
	35-31	2	9	4		9	7	0		15	1	

	& 36Over	1	8	20		8	21	0		29	0	
Level Education	Second school	22	3	3	**00.0**	0	25	3	**00.0**	20	8	**.000**
	Institute	1	17	13		6	25	0		27	4	
	Collage	0	8	12		20	0	0		20	0	
	Post graduated	0	0	3		3	0	0		3	0	
Experiences (Years)	≥1	6	4	0	**00.0**	4	5	1	**00.2**	2	8	**.000**
	5-1	14	8	0		2	18	2		18	4	
	10-6	3	8	11		15	7	0		22	0	
	≤10	0	8	20		8	20	0		28	0	

Note: Chi-square test P-value < 0.05 is statistically significant
F=frequency A=Appling =sometime, N=never, N=never, P=positive, N=negative)   (

Table (6) Correlation between KPA

Items	r	P.Value
Knowledge, practices	.513	.000
Knowledge, attitude	.637	.000
Practices, Attitude	.392	.000

DESICCATION:

The cannula is used to give therapy using different solutions injected into the vein in hospitals and during crises to save the patient's life. However, there are several issues and complications related to the cannula that can occur due to negligent or faulty installation, as well as a need for more information about the correct methods for installing the cannula. It is essential to teach the nurse or other healthcare provider the exact cannulation method to safeguard the patient. [1] [14]

In this paper, we will discuss the evaluation of nurses' information and practices and their attitudes in preventing cannulation-related problems.

Table (1) As the distribution of the percentages and frequencies of the demographic data participants paper demonstrated, the majority of the participants were females (73.2), while the highest percentage was for the age group 36 and over, and by 35.4, regarding the level of education, it was for the diploma certificate, by 37.8 regarding years of job experiences, and by category 1-5 years A by 26.9. study's findings align with a survey in Pakistan released in 2017 to evaluate nurses' habits and expertise in the care of peripheral I/V cannulation. [15]

Table (2) This shows the level of knowledge of the nurses participating in the study, as it included 15 questions. Most of the answers was a good level of knowledge, except for the first question about superficial phlebitis, defined as a limited and non-dangerous inflammation with an average score of (1.098). The third question concerns some drugs and liquids with high acidity that can irritate the vein with a mean (1.092). The question about the infiltration is liquid outside the vein with an average of 1.146. The last question is fixing the cannula with a transparent adhesive tape assists in the early diagnosis of phlebitis and infiltration by mean (.951); these questions were evaluated at a low level of knowledge. The weighted average of the knowledge section was ((1.4309)) with a standard deviation.35342, This indicates that the general trend is (good) according to the 1-2 good scale as in Table (3) since the (1.4309) line in the period. (.35342) Good level of knowledge related to preventing complications of the cannula. The paper's results are consistent with a study of trainees' attitudes towards intravenous cannulations conducted in Ireland and published in 2011, where the knowledge level of the participants was assessed as low. [1]

Table (3) shows descriptive statistics for the practice of nurses regarding the prevention of complications of cannula .from which find that the highest average was awarded for questioning one (Observe the site of the cannula first 10 minutes)with a mean (2.610) followed by question two (Remove the IV cannula immediately when appearing signs and symptoms of infection or infiltration) with a mean (2.5976) followed by question three (Tornica site above the vein by 10 cm) with a mean (2.585) the weighted mean of the practices section was ((2.2504))

with an SD of .34324, which indicates that it is (always) as general trend according to 3 points Likert scale as in table (3) since the (2.2504) line in the interval (2.34-3) Always,

Table (4), the weighted average of the attitude section was ((2.7073)) with a standard deviation of (.71125); this indicates that the general trend is (positive) according to the (1.6-2=positive scale) as in Table (3) since the (2.7073) line in the period. (.71125) nurses' positive attitude related to preventing cannula complications**.**

Table (5) chi-square associated between demographic variables of participants, knowledge, practice, and attitudes about preventing complications of cannulation The result found that there was no statistically significant relationship between variables (gender and age) with practices and attitudes at a significant value higher than 0.05. The results of the research coincide with another study conducted in Iraq found that there was no significant relation between HCW's demographic characteristics with the practice of peripheral IV cannula insertion, P-value (age = 0.39, gender = 0.54,) [10]

On the other hand, there is a statistically significant association between the variables of age, gender, educational level, and years of experience and their knowledge, practice, and attitudes, with a significant level of less than 0.05. the Nurses with university education have a good level of knowledge, always application, and a positive attitude to prevent complications from cannulation.

Table (6) shows the correlation coefficient between knowledge, practices, and attitudes to prevent cannula complications. The results showed a medium correlation between knowledge and practices with a value of .513, Followed by a strong correlation between knowledge and attitudes with a value of 637. finally, the lowest value was weak between practices and attitude, with a value of 392. All coefficients are statistically significant at less than .005

CONCLUSION

Based on the results of the current study, the study concluded that most participants have good information about reducing cannulation problems, which is reflected in their behavior and practice Nurses need adequate clinical guidance while performing cannulation. A dedicated teaching module and clinical support surrounding peripheral venous catheters should become an integral part of the induction week for trainees.

RECOMMENDATION:

Our recommendations are to implement special training sessions for all HCWs working in the hospitals to prevent cannula complications cannula procedures. Specially trained and highly qualified nurses should teach other medical staff about the hospital's documentation, and labeling should be mandatory in intravenous cannula procedures. Furthermore, differentiation between vesicant and no vesicant drags with steps management of extravasation.

REFERENCES

1) Carr, P. J., Glynn, R. W., Dineen, B., Devitt, D., Flaherty, G., Kropmans, T. J., & Kerin, M. (2011). Interns' attitudes to IV cannulation: a KAP study. *British Journal of Nursing*, *20*(4), S15-S20.

2) Carr, P. J., Glynn, R. W., Dineen, B., & Kropmans, T. J. (2010). A pilot intravenous cannulation team: an Irish perspective. *British Journal of Nursing*, *19*(10), S19-S27

3) Hussin, B. K. (2021 Prevention of Extravasation Non-Cytotoxic Agents (Review Study). *Himalayan Journal of Nursing and Midwifery, 1(5)*.

4) Jayanthi, N. V., & Dabke, H. V. (2006). The effect of IV cannula length on the rate of infusion. *Injury*, *37*(1), 41-45.

5) Rowley, S., Clare, S., Macqueen, S., & Molyneux, R. (2010). ANTT v2: an updated practice framework for aseptic technique. *British Journal of Nursing*, *19*(5), S5-S11.

6) Ahmed, K. A., & Hamawandi, N. M. ASSESSMENT OF PERIPHERAL INTRAVENOUS CANNULA INSERTION PRACTICE AMONG HEALTH CARE WORKERS OF SULAIMANI SURGICAL TEACHING HOSPITAL, SULAIMANI, IRAQ.

7) Makafi, S. A. M., & Marfega, M. A. C. M. (2017). Peripheral intravenous catheter (PIVC) related local complications among patients in KFCH-Jizan. *Advanced Practices in Nursing*, *2*(3), 138.

8) Osti, C., Khadka, M., Wosti, D., Gurung, G., & Zhao, Q. (2019). Knowledge and practice towards care and maintenance of peripheral intravenous cannula among nurses in Chitwan Medical College Teaching Hospital, Nepal. *Nursing open*, *6*(3), 1006-1012.

9) Juszczakiewicz, P., Dykowska, G., & Czerw, A. (2018). Patient's safety as regard to realization of procedures related to short-term iv peripheral venous access devices use by midwives. *Journal of Public Health and Medical Rescue*, *3*, 45-50.

10) Ahmed, K. A., & Hamawandi, N. M. Assessment of peripheral intravenous cannula insertion practice among health care workers of sulaimani surgical teaching hospital, *sulaimani, iraq*.

11) Hussin, B. K. (2021). Assess Nurses Knowledge Regarding Extravasation NonCytotoxic Medication

in Baghdad Teaching Hospital. *Indian Journal of Forensic Medicine & Toxicology*, *15*(2).

12) Morgaonkar, V. A., Shah, B. V., Nimbalkar, S. M., Phatak, A. G., Patel, D. V., & Nimbalkar, A. S. (2017). Educational intervention to improve intravenous cannulation skills in paediatric nurses using low-fidelity simulation: Indian experience. *BMJ paediatrics open*, *1*(1).

13) Larsen, P., Eldridge, D., Brinkley, J., Newton, D., Goff, D., Hartzog, T., ... & Perkin, R. (2010). Pediatric peripheral intravenous access: does nursing experience and competence really make a difference?. *Journal of Infusion Nursing*, *33*(4), 226-235.

14) Hussin, B. K., & Ahmed, W. A. R. (2020). nurses knowledge about management extravasation intravenous cytotoxic medication at amal national hospital in Baghdad City. *Indian Journal of Forensic Medicine & Toxicology*, *14*(3), 1159-1164.

15) Qamar, Z., Afzal, M., Kousar, R., Waqas, A., & Gilani, S. A. (2017). Assess nurses knowledge and practices towards care and maintenance of peripheral intravenous cannulation in Services Hospital Lahore, Pakistan. *Saudi Journal of Medical and Pharmaceutical Sciences*, *3*(6B), 608-614.

16) Graveto, J. M., Santos, D. V., Oliveira, A. D. S. S., & Osorio, N. (2016). Nursing Care in Peripheral Intravenous Catheter: Impact on Microbiological Profile.

17) Hussin, B. K., & Idaned, Z. K. (2022). Incidence of Needle Stick and Sharp Items Injuries Among Nurses At Al-Kindy Teaching Hospital. *Pakistan Journal of Medical & Health Sciences*, *16*(04), 961-961.

18) Morris, W., & Heong Tay, M. (2008). Strategies for preventing peripheral intravenous cannula infection. *British journal of nursing*, *17*(Sup8), S14-S21.