

# Barriers Confronting Nurses' Practices during Intravenous Cannulation for Children in the Emergency Units

KADHIM JAWAD KADHIM<sup>1</sup>, SERWAN JAFAR BAKEY<sup>2</sup><sup>1</sup>Academic Bachelor's Nurse \ Al Zahra Teaching Hospital\ IRAQ<sup>2</sup>Associate Professor \ Adult Nursing Department \ College of Nursing \ University of Baghdad. E-mail: [dr.serwanj@conursing.uobaghdad.edu.iq](mailto:dr.serwanj@conursing.uobaghdad.edu.iq).Corresponding author: Kadhim Jawad Kadhim, Email: [Kazem.Jawad1204a@conursing.uobaghdad.edu.iq](mailto:Kazem.Jawad1204a@conursing.uobaghdad.edu.iq)

## ABSTRACT

**Background:** children admitted to hospitals, especially to emergency departments, always need intravenous catheterization to receive treatment. It is still hard for healthcare providers, including nurses to perform intravenous catheterization (cannulation) for pediatric patients. Barriers to perform intravenous cannulation for pediatric patients should be determined to enhance nurses' practices and performance to achieve this action and decrease patients' suffering.

**Aims of the study:** This study aimed to assess nurses' practices and barriers confronting nurses during Intravenous Cannulation among Pediatric Patients, and to find out relationships between nurses' practices and their demographic characteristics that include age, gender, level of education, years of experience in nursing, years of working, training sessions

**Methodology:** A descriptive study design was conducted on Emergency nurses at al-Hussein teaching hospital for the period of October 15th, 2021, to March 30th, 2022. A non-probability (Purposive) sample was selected of 25 nurses who work at al-Hussein teaching hospital. The data was collected using a previously prepared questionnaire and official agreement to use the study questionnaire was obtained from the original author. Descriptive statistics (frequencies, percentages, mean, and standard deviation) and inferential statistics (contingency coefficient) were used in the data analysis.

**Results:** Results presented that nurses were confronting barriers about documentation of intravenous cannulation and procedures of removing intravenous cannula. Moreover, results showed a significant relationship between nurses' practices with intravenous cannulation with their gender at  $p$  value = .031.

**Conclusion:** The study concluded that nurses face barriers with pediatric intravenous cannulation especially with the use of right procedure to remove the cannula.

**Keywords:** barriers, nurses, emergency, pediatric, intravenous cannulation.

## INTRODUCTION

Children admitted to hospitals, especially to emergency departments, always need intravenous catheterization to receive treatment. It is still hard for healthcare providers, including nurses to perform intravenous catheterization (cannulation) for pediatric patients<sup>1</sup>. Barriers to perform intravenous cannulation for pediatric patients should be determined to enhance nurses' practices and performance to achieve this action and decrease patients' suffering<sup>2</sup>.

## METHODOLOGY

**Design of the Study** A descriptive study design was carried out in order to achieve the objectives of the study. The study was initiated from October 15th, 2021 through March 30th, 2022.

**Setting of the Study:** The study was carried-out at the emergency department at al-Hussein teaching hospital.

**The Sample of the Study:** A non-probability (purposive) sample of (25) nurses were selected from emergency department at al-Hussein teaching hospital

**Data collection:** Data were collected through the use of a questionnaire by means direct interview with nurses from the January 20th, 2022, until the February 10th, 2022.

**The Study Instrument:** A previously prepared questionnaire was used after getting the permission from the original authors. The reliability of the questionnaire was .87 which was acceptable to be used in this research.

**Rating and Scoring:** The items of the questionnaire were scored as (One) for no and (two) for yes about applying the practice.

**Statistical data analysis:** Data were analyzed through the use of IBM-Statistical Package of Social Sciences (SPSS) which included descriptive statistics (Frequency (F) Percentage (%), Mean, and Standard Deviation; and Inferential statistics (contingency coefficient).

## RESULTS

Table (1) presented that 32 percent of the study sample were nurses within age group (19- 28) years old, and most of them

56 percent were female, and they accounted for (76 %) of the whole sample. Relative to nurses' education level, most of them were nursing institute graduates with diploma degree in nursing and they accounted for (40 %). 44 percent of the sample have 1 – 5 years of experience in Emergency Units.

Table 1: Distribution of the Study Sample (Nurses) by their Demographic Characteristics.

Age	F	%
19 – 28	8	32
29 – 38	7	28
39 – 48	5	20
49 and more	5	20
Total	25	100
Mean ± SD	36 ± 11.32	
Gender	F	%
Male	11	44
Female	14	56
Total	25	100
Education Level	F	%
Nursing School Graduate	6	24
Nursing Institute Graduate	10	40
Nursing College graduate	9	36
Higher Degree (post-graduate) in Nursing	0	0
Total	25	100
Years of Experience in Emergency Unit	F	%
1 – 5 years	11	44
6 – 10 years	7	28
11 – 15 years	3	12
16 – 20	3	12
21 years and more	1	4
Total	25	100

Table (2) presented that there were difficulties and challenges face pediatric nurses during IV cannulation as shown in item 7,8, and 12, as well as moderate difficulties in other items, and low difficulties in items 4,5, and 12.

Table 2: Pediatric Nurses' Practical challenges during IV cannulation

List	Items	Sample Response			Mean	S.*
		Never	Some- times	Always		
1	Wash hands before performing intravenous cannulation	17	1	7	1.6	M
2	The nurse uses sterilization technique during preparation and insertion of the intravenous cannula	5	5	15	2.4	M
3	The nurse uses Gloves before the intravenous cannulation procedure	14	3	8	1.76	M
4	The nurse prepares the patient's skin before performing the intravenous cannulation (disinfection of the site)	4	2	19	2.6	H
5	The nurse uses a clear, visible vein in the forearm	0	1	24	2.96	H
6	After the intravenous cannulation is performed, the nurse disposes of the cannula needles into the designated waste isolation bin	11	3	11	2	M
7	The nurse educates the patient on how to recognize the signs and symptoms of intravenous cannulation infection	22	1	2	1.2	L
8	The nurse writes down the date, time, location, and size of the cannula (documentation)	23	0	2	1.16	L
9	The nurse changes the bandage when it is wet	7	5	13	2.24	M
10	The nurse changes the intravenous cannula 72 hours after it is inserted	9	4	12	2.12	M
11	When the nurse sees that there is a sign of phlebitis, they immediately change the intravenous cannula	4	5	16	2.4	H
12	The nurse uses sterile technique and prepares gloves, alcohol, and gauze while removing the intravenous cannula	19	1	5	1.44	L

\*S = significance. L = Low (1 – 1.66), M = Moderate (1.67 – 2.33), H = High (2.34 – 3).

Table 3: Causes correlation of the contingency coefficient and significant level responding nurses' Practices among age

Nurses' Practice Age	Never	Sometime	always	Total	*C.C. test	**P-value	CS
19 - 28	F 0	5	3	8	.537	.118	N.S
	% 0	20	12	32			
29 - 38	F 2	5	0	7			
	% 8	20	0	28			
39 - 48	F 3	2	0	5			
	% 12	8	0	20			
49 years and more	F 1	2	2	5			
	% 4	8	8	20			
Total	F 6	14	5	25			
	% 24	56	20	100			

\*Contingency coefficient. \*\*S= significant (p-value ≤ 0.05)

This table showed that there was no significant relationship between age and nurses' practice at P value = .118).

Table 4: Causes correlation of the contingency coefficient and significant level responding nurses' Practice among gender

Nurses' Practice Gender	Never	Sometime	always	Total	*C.C. test	**P-value	CS
Male	F 5	4	2	11	.413	.031	S
	% 20	16	8	44			
Female	F 1	10	3	14			
	% 4	40	12	56			
Total	F 6	14	5	25			
	% 24	56	20	100			

\*Contingency coefficient. \*\*S= significant (p-value ≤ 0.05)

This table showed that there was a significant relationship between gender and nurses' practice at P value = .031).

Table 5: Causes correlation of the contingency coefficient and significant level responding nurses' Practices among level of education

Nurses' Practice Level of Education	Never	Sometime	always	Total	*C.C. test	**P-value	CS
Nursing School Graduate	F 2	3	1	6	.225	.856	N.S
	% 8	12	4	24			
Nursing Institute graduate	F 3	5	2	10			
	% 12	20	8	40			
Nursing College Graduate	F 1	6	2	9			
	% 4	24	8	36			
Total	F 6	14	5	25			
	% 24	56	20	100			

\*Contingency coefficient. \*\*S= significant (p-value ≤ 0.05)

This table showed that there was no significant relationship between level of education with their practice at P value = .856).

Table 6: Causes correlation of the contingency coefficient and significant level responding nurses' Practices among years of experience in Emergency department

Nurses' Practice Years of Experience in emergency department	Never	Sometime	always	Total	*C.C. test	**P-value	CS
1 – 5	F 1	7	3	11	.552	.203	N.S
	% 4	28	12	44			
6 – 10	F 2	5	0	7			
	% 8	20	0	28			
11 – 15	F 2	1	0	3			
	% 8	4	0	12			
16 – 20	F 1	1	1	3			
	% 4	4	4	12			
21 and more	F 0	0	1	1			
	% 0	0	4	4			
Total	F 6	14	5	25			
	% 24	56	20	100			

\*Contingency coefficient. \*\*S= significant (p-value ≤ 0.05)

This table showed that there was no significant relationship between years of experience in ICU and nurses' practice at P value = .203).

## DISCUSSION

Table (1) presented that 32 percent of the study sample were nurses within age group (19- 28) years old, and most of them (56) percent were female, and they accounted for (76) percent of the whole sample. Relative to nurses' education level, most of them were nursing institute graduates with diploma degree in nursing and they accounted for (40) percent. 44 percent of the sample have 1 – 5 years of experience in Emergency Units. Study conducted on 34 nurses in a hospital in United States of America to measure difficulties and failure of intravenous insertion ,the authors of this study found that 97 percent of the study sample were female, 53 percent have bachelor's degree in nursing, nurses' mean age was 38 years old<sup>3</sup>.

Another study conducted a on 40 pediatric nurses from a hospital in Karachi, Pakistan to determine gaps in knowledge and practices of nurses about caring for pediatric patients. The authors of this study found that 87.5 percent of the study sample were within age group of 20 and 30 years old. Moreover, 85 percent of the nurses were females, and more than half of them had diploma degree in nursing. In addition, mean of years of experience as pediatric nurse was 2.6 years in which 77.5 percent of them had less than one year to two years of experience as pediatric nurses<sup>4</sup>.

Table (2) presented that there were difficulties and challenges face pediatric nurses during IV cannulation as shown in item 7,8, and 12 in relation to educate the patients about infection of intravenous cannulation, nurses' documentation about intravenous cannulation, and poor procedure to remove intravenous cannulation. Study reported that about 20 percent of nurses' attemptions to intravenous insertion were failed<sup>3</sup>. Another study conducted on nurses to measure their level of knowledge and practices toward peripheral intravascular cannulation and found that more than half of nurses had acceptable level of knowledge about peripheral intravascular cannulation<sup>5</sup>.

Table (3,5, and 6) showed that there were no significant relationship between nurses' practices about intravenous cannulation with their age at P value = .118, level of education at P value = .856, and years of experience in emergency department at P value = .203). While, table (4) showed that there was a significant relationship between gender and nurses' practice at P value = .031). Study reported that nurses' experiences increased with increased age, as a result, older nurses have higher successful rate of intravenous insertion at (P value = .001)<sup>3</sup>. Another study found that there was no significant relationship between nurses' practices with their demographic characteristics as p value more than (.05)<sup>5</sup>. Another study conducted on 29

pediatric nurses who worked at Minia General Hospital at Egypt and found no relationship between nurses' practices with their demographic characteristics<sup>6</sup>. Study conducted on pediatric nurses in a hospital in China and found a significant relationship between organization support and nurses' practices about fixation of peripheral intravenous cannulation<sup>7</sup>.

## CONCLUSION

The study concluded that nurses face barriers with pediatric intravenous cannulation especially with the use of right procedure to remove the cannula.

### Recommendation:

The study recommended to accomplish further studies on a large population to evaluate barriers facing pediatric nurses in Iraq to conduct intravenous cannulation for children. Moreover, educational sessions should be conducted to teach nurses the right steps in performing intravenous cannulation procedure for pediatric patients.

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