

TRAINING PROGRAM ROLE IN IMPROVING NURSES' KNOWLEDGE AND SKILLS OF URETHRAL CATHETERIZATION AT MATERNITY HOSPITAL IN DUHOK CITY

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ABSTRACT

Female urethral catheterization is a common nursing procedure using during patients hospitalization. Improper insertion can lead to urethral injuries & increase risk of urinary tract infections. Educating and training nurses provide skills based on knowledge and result in minimized catheter associated complications. The aim of the study is to find out the role of training program in improving nurses knowledge and performance skills of female urethral catheterization. The study was quasi-experimental study design was conducted in maternity hospital in Dohuk city-Iraq. A convenience sample of 31 nurses from different units was used to demonstrate the effect of training programs. A knowledge questionnaire & a performance skills checklist were used to collect the data. The study showed that 45.2% of the study nurses', years of experience were less than 5 years and with diploma degree. The low level of nurses' knowledge 74.2% was detected in pre-test while in post-test the good level of nurses' knowledge was increased to 83.9% as effect of training program. Moreover, 96.8% of the nurses scoring a low performance skills level in pre-test, while it was achieved that all nurses scoring good performance level at post-test. No association was found between nurses' knowledge, performance skills and nurses job characteristics; only association was found between nurses' performance skills and years of experience. The training program have positive outcome on nurses' knowledge and performance skills in regards to the female urethral catheterization.

KEYWORDS: Urethral catheterization, knowledge nurses , performance skills , training program.

INTRODUCTION

The *catheter* is a word which is derived from the ancient Greek *kathiénai* meaning "to send down." The use of the Catheters was as early as 3,000 B.C. in order to remove and relieve the retention of urinary bladder. In those times, many materials were used to form a hollow catheter shape, including :rolled up palm leaves, hollow tops of onions, straw, as well as, gold, silver, lead, copper, and brass, (Carithers and Palumbo, 2016).

The Foley urinary catheter came into existence in the 1930s. Frederick Foley, began to experiment with many kinds materials & methods for catheters of that time. In 1934, Foley catheters were on the market, it is the most common type in use today (Saint, 2011). The drainage of urine is undertaken either by using an open system, intermittent for relief or a closed one which is called indwelling or via supra-pubic catheter (Gould *et al.*, 2009). Other than its material, the indwelling urethral catheter remains relatively unchanged in its shape until these days (Turing *et al.*,

2016). About 4 million Americans undergo indwelling urinary catheterization each year (Gray and M.L.2008). Approximately, 450,000 people use long-term urinary catheters in the UK (Bardsley, 2015). Between 15-25% of the hospitalized patients receive the short-term indwelling urinary catheters. In many cases, catheters are placed for false indications, and healthcare providers are often unaware that their patients have catheters, which lead to prolonged and unnecessary use (Hooton *et al.*, 2009). About 5% of Urinary tract infection (UTI) had developed each day due to catheterization. Catheter-related UTI is associated with increased morbidity and mortality (Saint and Lipsky, 1999).

Urinary catheterization is an essential part of modern medical care. It's commonly used for many indications: Acute & chronic urinary retention or obstruction, Maintain a continuous drainage of urine for difficulty voiding among patients as a result of neurological disorders that cause paralysis or loss of sensation of urination, monitoring of urine output in critically ill patients,

used in preoperative patients for selected surgical procedures & for intra-operative monitoring of urinary output or anticipated prolonged duration of surgery & prolonged immobilization for example potentially unstable thoracic or lumbar spine, multiple traumatic injuries like pelvic fractures, in addition to administrate medications to the bladder & to improve comfort for end of life care if needed. (Gould *et al.*, 2009) (Kunin, 2001).

Female urinary catheterization is one of the fundamental skills needed for the application of nursing care professional in clinical areas (Ortega *et al.*, 2008). Inappropriate urinary catheter insertion technique can lead to urethral trauma and injuries, as resulted from application of excessive pressure during catheter insertion or from inflation of the balloon before reaching the bladder while still in the urethra which lead to bleeding from the urethra, chronic irritation or allergy and obstruction of the catheter are some others complications (Geavlete, 2016). The most common complication is the urinary tract infections (UTIs), the symptoms of a UTI may include: Fever, chills, headache, cloudy urine (due to pus), leaking of urine out of the catheter, foul-smelling urine, blood in the urine, low back pain, it can be more complicated by the release of urinary bacteria into the bloodstream (septicemia). (Hooton *et al.*, 2009) (Saint, 2011).

According to the centers for disease control and prevention (CDC), healthcare-associated infections (HAIs) in hospital are one of the top leading causes of morbidity and mortality in the United States and are among the most common adverse events in healthcare. (Klevenset *et al.*, 2007).

Urinary tract infections are one of the most common HAIs, representing more than 40% of the infections. At globally, 70-80% of these infections are attributable to use of an indwelling urethral catheter. (Gokula *et al.*, 2004). In 2009, CDC developed some guidelines for prevention of Catheter associated urinary tract infections (CAUTIs), Educate periodically the staff on proper urinary catheter insertion and care, which include the following; Use catheter only when necessarily indicated, Use strict hand washing skills, Use sterile technique with catheter insertion, Secure urinary catheter properly after insertion, Maintain closed sterile drainage system, Maintain free flow of urine prevent

obstruction, and use smallest size (bore) catheter. (Saint *et al.*, 2009).

Nurses are responsible for the insertion and management of urinary catheters in addition to removal it. Nurses are often the first who detect the problem and complications among catheterized patients and reply a vital role in solving them, so they are at the frontline of catheter care. (Yoon *et al.*, 2013).

Female urethral catheterization is widely used in maternity hospital during patients undergoing Caesarean section and during labour for relieving full bladder. The nurses in Duhok city do not have good knowledge about infection control and have not guideline to proper aseptic technique during procedure of urinary catheterization (Khalid, 2016). Educating and training nursing staff will help them to be aware about the proper catheter insertion and maintenance care (Bernard *et al.*, 2012). Training nurses in urinary catheterization should be universal and should aim to include step by step instruction in the process, emphasis on history taking and raising of awareness of factors associated with increased risk of urethral injury (Manalo *et al.*, 2011).

To the best of our knowledge there were not any studies about this subject in Duhok governorate and because of the potential widespread use of training program in order to improve nurses' knowledge and skills. So the study was aimed to assess baseline knowledge and performance skills score toward female urinary catheterization among nursing staff and the association of their knowledge and skills with: Qualification degree, Years of experience and Unit of working, then to assess the change in knowledge and skills performance after being involved in training program.

PARTICIPANTS AND MATERIALS

A quasi-experimental pre- and post-test study carried out to assess the role of training program on nurses knowledge and skills regarding female urethral catheterization. It was conducted during the period from 15th of January, 2016 to 20th of October. Data were collected during the period from first day of May to 27th of May 2016, at the Maternity Teaching Hospital in Dohuk city. Before starting with the data collection, the researcher obtained a formal administrative approval of Research Ethics Committee to

conduct the study from Directorate of health (DOH) /Planning Department. The **inclusion criteria** included the nurses of any degree qualification and of any health experience from maternity hospital who were working in the following units: Delivery room, Operating rooms (elective and emergency theaters), Emergency unit, Post partum (General ward), and Reception unit. The **Exclusion criteria** were: Those nurses who were unwilling to participate in the study and weren't present at the time of the training program, with those who participated in the pilot study. Thirty one eligible nurses were enrolled through a convenience sampling procedure. The **Pre-training program assessment** included: *Self administrated MCQ test was used to record job characteristics of nurses and assess pre training knowledge and *Researcher completed performance skills checklist which used for assessing pre training performance skills. Then **Training program** which is a number of lessons linked to gather to teach the skills and knowledge about a particular job or activity (Cambridge dictionary) had 2 parts: A theoretical part, researcher presented a theoretical lecture about female urethral catheterization and the Practical part, researcher demonstrated steps of female urethral catheterization on a female doll and participants re-demonstrated the procedure. After that the **Post-training program assessment** which had: The same pre-test self administrated MCQ questionnaire, was used to assess post training knowledge. And The same performance skills checklist of pre test was used by researcher to record and assess post training performance skills. A panel of 9 experts in different fields was taken in order to validate the tools and to evaluate the contents of the program, self-administrative questionnaire and checklist.

The program lasted for a period of three weeks (1-5-2016) to (19-5-2016) on every Sunday, Monday and Tuesday at 9:00am to 11:30am. Each week a new set of nurses were presented. Week one consisted of eleven morning nurses, Week two consisted of ten nurses which were the nighttime shift nurses the week prior and Week three consisted of another ten nurses which were the evening shift nurses of week one. The Program of the first day was from 9:00 to 9:30am, all nurses received an individual self-administered questionnaire sheet. They were completed by the nurses and then evaluated by

researcher to determine the existing knowledge each nurse already had. Afterwards from 9:30 to 10:30 am each nurse was observed using the observational checklist while demonstrating the steps of urinary catheter insertion on a female doll. Finally from 10:30am to 11:30am the theoretical part was delivered to the nurses in the form of a lecture and open discussion that was allowed during the session using data show. On the Second day from 9:00 to 10:30am continuation of theoretical part of program was presented and each nurse was observed while a demonstration was given on how to properly insert a urinary catheter on a female doll with open discussion. Then on the third day: nurses received the same self-administrated knowledge questionnaire of the pre-test for assessing post training knowledge scores as a post test. And from 9:30am to 10:30 same observational checklist was completed by researcher to assess post program performance skills scores of nurses. This procedure was repeated over the program of all three weeks; each week with a different set of nurses. The pilot study was carried out at the Maternity Teaching Hospital/Duhok City during the period from 27th of February 2016 to 10th of March 2016. The sample consisted of 10 nurses, whom were divided in to two groups each 5 nurses each week was studied.

Inferential statistics: The data were analyzed by using statistical package for social sciences (SPSS version 19) through the application of two approaches. Paired 't' test was used to evaluate the effect of a training program on nurses' knowledge and skills. Chi-square test was used to find out the association between knowledge and skills of nurses and selected socio-demographic variable when the expected count was more than 20% of the cells of the table, Fisher exact test was used when the expected count was less than 5% of the cells of the table.

Scoring system for knowledge questions, the correct response was scored "2", while the incorrect scored 1 for nurses' knowledge. The level of knowledge 10-13 was considered low level, 14-17 was considered fair level while 18-20 was considered good level. For the performance skills and doing the step completely scored 3 and doing the step somewhat incompletely scored 2 was given while score 1 was given to a non-performed step. The level of skills performance 26-43 was considered low level, 44-60 was

considered fair level while 61-78 was considered good level of performance (Sobeih ,2015). The results regarded not statistically significant if P value >0.05 , if P value ≤ 0.05 its statistically significant and if P value ≤0.01 it is statistically highly significant.

RESULTS

The current study was conducted among 31 female nurses working in Maternity Hospital in Duhok city with different work experiences ranged less than one – 30 years in order to understand their existing knowledge and

performance skills about female urethral catheterization and assess the role of designed training program on their knowledge and performance skills through the pre and post of training program. ***Job characteristics of participants:** Table 1 showed that the highest percentage (45.2%) of the study participants, their experiences of working was less than 5 years ,while the lowest percentage (3.2%) was with 16-20 year of experiences. The same table revealed that the highest percentage (51.6%) of the study participants had diploma and the lowest percentage of the participants (3.2%) were having bachelor degree in nursing.

Table (1): Job characteristics of the study participants (n=31)

Variables		Frequency	Percentage %
Years of experience	Less than 5 Years	14	45.2
	6-10	4	12.9
	11-15	3	9.7
	16-20	1	3.2
	21-25	4	12.9
	26-30	5	16.1
Unit of working	Emergency department	7	22.6
	Post partum ward	7	22.6
	Delivery room	4	12.9
	Operating room	6	19.4
	Reception unit	7	22.6
Qualification degree	High School of Nursing	14	45.2
	Diploma	16	51.6
	BSc.in Nursing	1	3.2
Total		31	100

***Pre-training and Post-training program nurses' knowledge of female urethral catheterization:**

Table 2 showed that in pre-training program 80.6% of nurses, choose false answer of question number one “What is the storage capacity of urine in normal bladder?” About question number three “All are true about caring for a person with an indwelling urinary catheter except one?” 100% of

nurses choose wrong answer item and about “All are true about procedure of urinary catheterization except one?” 90.3% of nurses choose wrong answer item. While in post- training test it showed that (93.5%) of the study nurses choice the correct answer to question “What is the capacity of urine in normal bladder?”and the question “which type of catheters does not have balloon in its end?”with (96.8%) right answer.

Table (2): Pre-training knowledge and Post training program knowledge assessment: result of self-administrated knowledge, Questionnaire (n=31).

Knowledge questions	Pre-training knowledge			post-training knowledge		
	Answer Choice	Frequency	Percentage %	Answer Choice	Frequency	Percentage %
What is the capacity storage of urine in normal bladder?	False	25	80.6	False	2	6.5

	True	6	19.4	True	29	93.5
All are true about the physiology and anatomy of female urinary system except one?	False	16	51.6	False	2	6.5
	True	15	48.4	True	29	93.5
All are true about caring for a Person with an Indwelling Urinary Catheter except one ?	False	31	100	False	9	29.5
				True	22	71.0
How many ml of distal water should you use to inflate the balloon to keep a Catheter in place?	False	13	41.9	True	31	100
	True	18	58.1			
All are Indications for use of an indwelling urinary catheter except one?	False	23	74.2	False	4	12.9
	True	8	25.8	True	27	87.1
Which type of catheters don't have balloon in its end?	False	22	71.0	False	1	3.2
	True	9	29.0	True	30	96.8
Catheter size which are using for female adult?	False	27	87.1	False	3	9.7
	True	4	12.9	True	28	90.3
All are true about procedure of urinary catheterization except one?	False	28	90.3	False	6	19.4
	True	3	9.7	True	25	80.6
For the preparation of patient for Foley's catheterization we need all the following except one?	False	27	87.1	False	5	16.1
	True	4	12.9	True	26	83.9
About removing the indwelling urinary catheter all, are wrong except one?	False	9	29.0	False	3	9.7
	True	22	71.0	True	28	90.3

***Pre-training program performance skills assessment of study nurses toward female urethral catheterization.** Table 3 part one: showed that 77% of participant nurses did not review patient's chart for confirming medical order, not identify patient and not explain purpose of the procedure, and (51.6%) of studied nurses did not wash their hand before procedure and not use the clean gloves, also (96.8%) of study participants did not adjust bed to workable height or lower side rail. Additionally (90.3%) and (100%) studied nurses did not provide for patient privacy and did not use sterile gloves respectively.

Table (3):(part one): Pre-training program performance skills assessment result of researcher completed observational checklist.

Performance Items	Answer Choice	Frequency	Percentage %
Review patient's chart for confirming medical order, identify patient and explain purpose of the procedure.	Did not do	24	77.4
	Did somewhat	1	3.2
	Did completely	6	19.4
Gather all equipment and place on beside table	Did not do	21	67.7
	Did somewhat	1	3.2

	Did completely	9	29.0
Wash hands and done clean gloves.	Did not do	16	51.6
	Did completely	15	48.4
Adjust bed to workable height and lower side rail.	Did not do	30	96.8
	Did completely	1	3.2
Place patient to a supine position with knee flexed.	Did not do	9	29.0
	Did somewhat	2	6.5
	Did completely	20	64.5
Provide for patient privacy, close curtain or close door if possible.	Did not do	28	90.3
	Did completely	3	9.7
Cover patient's body with a blanket or sheet .cover each leg with separate sheet crisscrossing over the patients abdomen.	Did not do	28	90.3
	Did completely	3	9.7
Cleanse perineal area with appropriate antibacterial solution , rinse well ,and dry	Did not do	24	77.4
	Did somewhat	4	12.9
	Did completely	3	9.7
Remove clean gloves, discard and wash hands.	Did not do	29	93.5
	Did somewhat	1	3.2
	Did completely	1	3.2
Open sterile package, and place plastic package container between patients' legs.	Did not do	30	96.8
	Did completely	1	3.2
Done sterile gloves.	Did not do	31	100.0
Place drainage bag on sterile field.	Did not do	29	93.5
	Did completely	2	6.5
Carefully retract labia to fully expose urinary meatus with non-dominant hand.	Did not do	3	9.7
	Did somewhat	4	12.9
	Did completely	24	77.4
Total		31	100.0

The data showed in the Table 3 (part two) revealed that (58.1%) of studied nurses did not clean urinary meatus and insert catheter with dominant, sterile, gloved hand, use forceps to pick up a cotton ball saturated with antiseptic solution and cleanse the urinary meatus with one downward motion each time, one on each side and then down the middle. (96.8%) of study nurses did

not discard each cotton ball after use and repeat cleaning at least 2 to 3 times. And also results showed that (90.3%) study participant did not secure catheter to patient's upper leg with tape and not secure bag to the bed. additionally (83.9) study nurses did not document the application of procedure.

Table (3):(part two):Pre-training program performance skills assessment result of researcher completed observational checklist (n=31)

Performance Items	Answer Choice	Frequency	Valid Percent
To clean urinary meatus and insert catheter with dominant, sterile, gloved hand, ...	Did not do	18	58.1
	Did somewhat	12	38.7
	Did completely	1	3.2
Discard each cotton ball after use.	Did not do	30	96.8
	Did completely	1	3.2
Repeat cleaning at least 2 to 3 times.	Did not do	30	96.8
	Did completely	1	3.2
With dominant hand, continue to hold labia apart.	Did not do	23	74.2
	Did somewhat	3	9.7
	Did completely	5	16.1
Discard forceps.	Did not do	28	90.3
	Did somewhat	2	6.5
	Did completely	1	3.2
Lubricate the catheter 2.5 to 5 cm from the tip. Pick up with dominant, sterile ,gloved hand.	Did not do	10	32.3
	Did somewhat	16	51.6
	Did completely	5	16.1
Insert the catheter into the urinary meatus about 5-7.5 cm (2 to 3 inches) or until urine begins to flow, release labia and hold catheter in place with dominant hand.	Did not do	3	9.7
	Did somewhat	19	61.3
	Did completely	9	29.0
Inflate the retention balloon with sterile water per manufacturer's recommendations or the physician's orders. Gently pull back the	Did not do	3	9.7
	Did somewhat	22	71.0

catheter to make sure it is in place.	Did completely	6	19.4
Secure catheter to patient's upper leg with tape. Secure bag to bed rail.	Did not do	28	90.3
	Did somewhat	1	3.2
	Did completely	2	6.5
Remove drapes, used catheter equipment, and dry perineum	Did not do	29	93.5
	Did somewhat	1	3.2
	Did completely	1	3.2
Positions patient for comfort, side rails up, and in low position.	Did not do	30	96.8
	Did somewhat	1	3.2
Discard gloves and wash hands.	Did not do	27	87.1
	Did somewhat	1	3.2
	Did completely	3	9.7
Document the data of application	Did not do	26	83.9
	Did somewhat	1	3.2
	Did completely	4	12.9
Total	31	31	100.0

* Nurses' performance skills after training program

Table 4 part one: showed that 74.2% of study nurses reviewed patient's chart for confirming medical order, identify patient and explain purpose of the procedure and 100% of study participants placed drainage bag on sterile field and carefully retracted labia to fully expose urinary meatus with non-dominant hand.

Table (4):(part one): Post-training performance skills assessment: result of researcher completed observational checklist (n=31).

Performance Items	Answer Choice	Frequency	Percentage %
Review patient's chart for confirming medical order, identify patient and explain purpose of the procedure.	Did not do	7	22.6
	Did somewhat	1	3.2
	Did completely	23	74.2
Gather all equipment and place on beside table.	Did not do	2	6.5
	Did somewhat	1	3.2
	Did completely	28	90.3
Wash hands and done clean gloves.	Did not do	1	3.2
	Did completely	30	96.8
Adjust bed to workable height and lower side rail.	Did not do	10	32.3
	Did somewhat	1	3.2
	Did completely	20	64.5
Place patient to a supine position with knee flexed.	Did not do	1	3.2
	Did completely	30	96.8
Provide for patient privacy, close curtain or close door if possible.	Did not do	2	6.5
	Did completely	29	93.5
Cover patient's body with a blanket or sheet .cover each leg with separate sheet crisscrossing over the patients abdomen.	Did not do	1	3.2
	Did somewhat	4	12.9
	Did completely	26	83.9
Cleanse perineal area with appropriate antibacterial solution , rinse well ,and dry.	Did completely	31	100.0
Remove clean gloves ,discard and wash hands.	Did not do	2	6.5
	Did completely	29	93.5
Open sterile package, and place plastic package container between patients' legs.	Did completely	31	100.0
Done sterile gloves.	Did not do	4	12.9
	Did completely	27	87.1
Place drainage bag on sterile field.	Did completely	31	100.0
Carefully retract labia to fully expose urinary meatus with non-dominant hand.	Did completely	31	100.0
Total	31	31	100.0

Table (4):(part two): Post-training performance skills assessment: result of researcher completed observational checklist (n=31).

Performance Items	Answer Choice	Frequency	Valid Percent
To clean urinary meatus and insert catheter with dominant, sterile, gloved hand,	Did completely	31	100.0
Discard each cotton ball after use	Did completely	31	100.0
Repeat cleaning at least 2 to 3 times	Did completely	31	100.0
With dominant hand, continue to hold labia apart.	Did completely	31	100.0
Discard forceps.	Did completely	31	100.0
Lubricate the catheter 2.5 to 5 cm from the tip.	Did somewhat	1	3.2
Pick up with dominant, sterile ,gloved hand	Did completely	30	96.8
Insert the catheter into the urinary meatus about 5-7.5 cm (2 to 3 inches) or until urine begins to flow, release labia and hold catheter in place with dominant hand.	Did somewhat	2	6.5
	Did completely	29	93.5
Inflate the retention balloon with sterile water per manufacturer's recommendations or the physician's orders. Gently pull back the catheter to make sure it is in place.	Did somewhat	1	3.2
	Did completely	30	96.8
Secure catheter to patient's upper leg with tape. Secure bag to bed rail.	Did completely	31	100.0
Remove drapes, used catheter equipment, and dry perineum	Did not do	2	6.5
	Did somewhat	2	6.5
	Did completely	27	87.1
Positions patient for comfort, side rails up, and in low position.	Did not do	3	9.7
	Did somewhat	2	6.5
	Did completely	26	83.9
Discard gloves and wash hands.	Did not do	3	9.7
	Did completely	28	90.3
Document the date of application	Did not do	7	22.6
	Did completely	24	77.4
Total		31	100.0

***Levels of nursing staff's knowledge and performance skills:** The study showed that (74.2%) of study nurses had a low level of knowledge before implementation of training program while after implementation of program study results showed that (83.9%) of participant

nurses were with the good level of knowledge as in table 5. Table 6 showed that highly significant statistical difference in knowledge and performance skill score after training program at p value < 0.05.

Table(5): Knowledge and performance skills score level before and after training program.(n=31)

	Score level	Frequency		Percentage%		Mean of score	
		Pre test	Post test	Pre test	Post test	Pre test	Post test
Knowledge levels	Low (10-13)	23	0	74.2	0.00	1.26	2.84
	Fair(14-17)	8	5	25.8	16.1		
	Good(18-20)	0	26	0.00	83.9		
Performance skills levels	Low (26-43)	30	0	96.8	0.00	1.06	3.00
	Fair (44-60)	0	0	0.00	0.00		
	Good(61-78)	1	31	3.2	100.0		
Total		31	31	100.0	100.0		

Table (6): Summary statistics comparing pre and post test scores of knowledge and performance skills. (n=31)

	Paired Differences				T value	df	* (2-tailed)	
	Mean Difference	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower				Upper
Knowledge score in pre-test & post-test	-6.000	1.592	.286	-6.584	-5.416	-20.989	30	*0.001

Performance skills score in pre-test & post-test	-37.452	7.805	1.402	-40.315	-34.589	-26.715	30	*0.001
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*Based on paired t test

*** Association of Job characteristics:** There was no significant association between years of experience, unit of working and qualification degree and knowledge of nurses, (the p value was >0.05), as in Table 7. The same was for nurses' performance skills and unit of working and qualification degree ($p > 0.05$), but the association was found between the performance skills and years of experience as ($p < 0.05$) as in Table 7.

Table (7): Association between job characteristics and knowledge and performance skills of study nurses (n=31)

Variables		Nurses' Knowledge			P. Value	Nurses' Skill			P. Value	
		False Answers	True Answers	Total		Did not Do	Did Some what	Did Completely		Total
Years of experience	Less than 1 - 5 Years	98	42	140	*0.942	272	43	49	364	*0.001
	6-10	29	11	40		54	15	35	104	
	11-15	23	7	30		59	8	11	78	
	16-20	8	2	10		19	4	3	26	
	21-25	27	13	40		84	7	13	104	
	26-30	36	14	50		99	15	16	130	
Unit of Working	Emergency department	51	19	70	*0.63	139	23	20	182	*0.111
	Post partum ward	50	20	70		133	14	35	182	
	Delivery room	33	7	40		77	13	14	104	
	Operating room	46	14	60		111	24	21	156	
	Reception unit	41	29	70		127	18	37	182	
Qualification degree	High School of Nursing	101	39	140	*0.955	278	42	44	364	** 0.92
	Diploma	113	47	160		292	46	78	416	
	B Sc. in nursing	7	3	10		17	4	5	26	

*Based on chi2, ** Based on exact fisher test

DISCUSSION

In this quasi-experimental study aimed to evaluate the role of training courses on nurses' knowledge and performance skills toward female urethral catheterization which is a very important subject to empower nurses with best knowledge and skills performance to avoid the catheter associated complications.

About the Years of experience, in this study, nearly half of the study nurses (45.1 %), their years of experience were less than 5 years. This was because most of the nurses in the maternity hospital in Duhok city were new graduates. This is similar to the results in USA (Gordon, 2015b) which found that 59% of his sample, their experience ranged from 1-5 years.

About the qualification degree (51.6%) of the study nurses were having diploma, this result was

not-going with the result of Gordon (2015a) who found that 75.4% of studied nurses have Bachelor degrees. Another study conducted by Suchitra and Devi (2007 b) showed that more than three-fourth (76.7%) were having Bachelor's degree holders. This may be due to that generally in Duhok city the number of Bachelor's nurses are low and especially in maternity hospital.

A noticeable finding of the study was that all the nurses who have been shared in the study did not attend to any training courses regarding female urinary catheterization despite availability of infection control and quality assurance program, and this result was consistent with Nasser (2012) and Yousef (2009), both showed that the nurses in their studies had not attended to any training program.

With regard to level of nurses' knowledge toward female urinary catheterization, in the pre-test as existing nurses' knowledge the majority of them (74.2%) had low knowledge level and 25.8% had fair knowledge and no nurse had good knowledge. This is because no one attended to any educational or training program and they have low basic information. The finding of this study was consistent with the finding of the study conducted by Suchitra and Devi (2007b) showed that more than two-thirds (70 %) had low level of knowledge and (30%) of nurses have average level of knowledge in urethra catheterization. Another study was done by Dobson et al. (1996) in Australian metropolitan area of health, they found that only 14% of nurses knowledge levels were adequate and 86% of nurses knowledge level were inadequate about catheterization. The same finding found by Logan (2003) in Hong Kong, the overall result revealed that enrolled nurses' knowledge of urinary catheter selection and management was poor. But these findings were not going with a study conducted by Prasanna and Radhika (2015) in India, they found that the majority staff of nurses (46.7%) had adequate knowledge, (33.3%) had moderately inadequate knowledge and 20% had inadequate knowledge about management of urinary catheterization. In regards to the performance skills of study nurses of female urethral catheterization in pre-test as nurses existing performance skills, in generally they practice their skills poorly.

Urinary catheterization is an invasive procedure with potentially serious complications that can cause embarrassment, physical and

psychological discomfort. To ensure the patient is prepared prior to catheterization it is the responsibility of the nurse to inform the patient of the reasons and necessity for the procedure, and obtain the permission from patient. The result of our study revealed that 77.4% didn't review a patient's chart neither inform the patient about the procedure, this is because of our nurses did not trained or know that it is very important to inform patient about the procedure or take permission from them.

About hand washing prior to insertion which is a fundamental skill for the control of nosocomial infection, observed compliance with hand hygiene in study nurses was poor, 51% of study nurses didn't wash their hand, this percentage changed to 96% of them washed hand after the training program. The result of our study is supported by a study done by Rosenthal et al.(2005), which found that education and frequent performance feedback produced a sustained improvement in compliance with hand hygiene prior to medical procedures.

Regarding the cleanings of the urinary meatus (38.7%) of the studied nurses were cleaning the urinary meatus but not in right manner used only one motion or wrong direction motion to clean it , and (58.1%) didn't clean the urinary meatus prior to the insertion, and only one did that completely. Cleanings of the urinary meatus is an important point and according to a study was done by Cunha *et al.* (2013), which showed that there is significant difference in the incidence of UTI when cleaning the urinary meatus by povidine iodine or saline prior to insertion of the urinary catheter. About the lubricant usage, in spite of availability of lubricant, only 5 of the study nurses use lubricant before insertion of catheter, about one third of them (32.3%) didn't use lubricant and 16 nurses use lubricant but not in right manner. National guidance recommends using a suitable lubricant from a single-use container when inserting urinary catheters significantly minimize the risk of infection and trauma to the urethra (Yates, 2015).

Related to the insertion of catheter, only (9.7%) of nurses inserted catheter in good manner and (61.3%) of them inserted the catheter in wrong & unsterile way and only 9 nurses inserted the catheter correctly. This is a high percentage of wrong performance skills because new graduated nurses are learning from old nurses with false

insertion, unsterile and touching the catheter tip before insertion with lack of desire to change or correct it. One study was done by Hudson and Murahata (2005), which showed that not-touch method provides a significant benefit in reducing the potential for external contamination during urinary catheterization. This result supports the recent recommendations for aseptic and sterile catheterization promoted within the guidelines issued by the CDC (Geng, 2012). In (90.3%) of study nurses didn't secure the catheter and only (6.5%) of nurses secured it, this was not similar to the finding of Revello and Gallo (2013) who found that 79% of the catheters were secured and 21% were not secured. Another study in Los Angeles by Darouiche et al. (2006) which found that statistical significant difference of 45% reduction in the rate of symptomatic UTI in patients who received the good securing at the thigh of patient which prevent movement and urethral traction.

Regarding the relationship between level of knowledge of nurses toward female urinary catheterization and selected job characteristic, the findings of the study clarified that there was no significant. This was consistent with findings of the study was done by Prasanna and Radhika (2015), they found no association between the level of knowledge of staff nurses regarding catheter care with their selected socio demographic variables. And another study is conducted in India by Jain et al. (2015), they found that there is no significant relationship between knowledge of health care personal and years of experience.

Regarding association between nurses performance skills of female urethral catheterization and job characteristics, it showed that there was no statistically significant association between performance skills & nurses qualification degree and unit of working, only association found with years of experience at p value ≤ 0.001 , the result was not consistent with Nasser (2012), who found that there is significant relationship between nurses practice and years of experience.

The result of the study revealed that highly statistical difference between pre and post-test nurses' knowledge and performance skills score toward female urinary catheterization at p-value ≤ 0.001 . This finding reflects the positive outcome of the training program, which improves

knowledge, and skills of nurses. Our findings are going with the results of prasanna and Radhika, (2015), who showed that there were highly statistically significant differences between level of acquired nurses knowledge in pre and posttest about urinary catheter management. The same results were found by Altun and Karakoç (2010) in Kocael of Turkey, which were significant improvement in mean scores after the workshop as compared with pre workshop scores at P value ≤ 0.001 . (Drekonja et al. 2010) also revealed that a more effective form of teaching with explanation of concepts is best method to improve knowledge and application of best practice technique for the invention and significant improvement in post workshop test scores.

The others three studies: first one by Jain et al. (2015) about the Knowledge and attitude of doctors and nurses regarding indication for catheterization and prevention of CAUTI as reminded the doctors in removing the catheter as soon as the indication of catheterization ended and showed that interventions in the form of routine educational training about catheter will definitely help in reducing unnecessary catheter use. The second one by Umer et al. (2016) who showed that nursing education of catheter insertion reflects best care practices has the potential to significantly reduce the incidence of post-operative CAUTI. The third one by Suchitra and Devi (2007b) about Education has a positive impact retention of knowledge and practices of nurses regarding urinary catheterization in controlling nosocomial-infection. But Willson et al. (2009) in Meta-analysis study of identifying the effect of staff education in prevention the complications of catheters who showed that there was limited evidence suggest that staff education reduce the incidence of CAUTI. **Limitations of the study** were: Lack of randomized sample procedure because of duties of participants, Small sample size, Loosening of 5 participants because of absence of participants at the time of training program or at the post test, and Implementation of program within short time in order to prevent communication between participants transferring information.

CONCLUSION: Most of the nurses have low level of knowledge and skills score, there were no significant association between knowledge and skills score and qualification degree, and unit of working. Knowledge and skills score were improved after the training program the difference was very highly significant for both. None of the included nurses have ever been enrolled in the training program before. It is very important to Adopt the training program by health authorities in order to train nurses working in the relevant field and communicate the result to authorities of nursing college and schools to evaluate the need for strength this subject in their curricula.

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پوخته

باگراوند: میزهرۆیی یا ژنان، کریاره‌کا به‌ره‌لاڤه ل نه‌خوشخانان ده‌یته ب کارئینان، و برنه ژوورا سونده‌ی ب ریه‌کا نه‌دروست بۆ کریاره‌کا قه‌سته‌را میزهرۆیی ده‌یته نه‌گه‌رئ تووشیوونا میزدانکئ و مه‌ترسا هه‌ودانین کوئه‌ندامئ میزهرۆیی زیده‌دکه‌ت، فیکرن و راهینانا پرستاران شیان و پیزانینین وان زیده‌دکه‌ت و ده‌یته نه‌گه‌ر سه‌ربارکین ل گه‌ل قه‌سته‌را میزهرۆیی کیم بین.

ڤه‌کولینئ: شیوازی

شیوازی ڤه‌کولینئ نه‌زمونی بوویه و پیکهاتیوو ل تیسنه‌کی به‌ری و پشتی پروگرامی راهینانئ، تیدا نمونه ل سه‌ر 31 په‌رستارا ژ به‌که‌یین جودا جودا ل نه‌خوشخانا ژنان و زارۆبوونئ ل ده‌وکی هاتنه وه‌رگرتن بۆ دیارکرن رۆلئ پروگرامی راهینانئ و ڤه‌کولینئ دا ڤۆرمه‌کا دیارکرن پیزانینان ل گه‌ل لیسته‌کا شیانین زانستی بۆ کومقه‌کرن دانایان هاتنه ب کارئینان. نه‌نجام:

ل دویف نه‌نجامین ڤه‌کولینئ دیاردیبت 45,2% ژ په‌رستاران شاره‌زایی ژ ساله‌کئ هه‌تا پینچ سالان ب باوه‌رناما دیلومی ل په‌رستاریه‌ هه‌بوو، نه‌و په‌رستارین هاتینه هه‌لبژارتن به‌ری پروگرامی راهینانئ 74,4% ناسته‌ وان یه‌ پیزانینین تیوری یه‌ کیم بوو، به‌لئ نه‌نجامی تاقیکرنی پشتی پروگرامی راهینانئ هه‌شته 83,9% کو پیزانین باش ژ نه‌گه‌رئ کارتیکرنا پروگرامی راهینانئ وه‌رگرتیوو. ژ لایه‌کئ دیترڤه دورین 93,8% په‌رستاران ناسته‌ شیانین وان یه‌ دانانا قه‌سته‌را میزهرۆیی به‌ری راهینانئ یه‌ کیمبوو، به‌لئ پشتی راهینانئ گه‌له‌ک باشبوون و چو په‌یوه‌ندی دنایه‌را زانینا تیوری و شیانین زانستی ل گه‌ل سالوخته‌تین کاری نه‌بوون، به‌لئ په‌یوه‌ندی دنایه‌را سالین شاره‌زایی و شیانین وان یه‌ن کاری هه‌بوون .

ده‌ره‌نجام: پروگرامین راهینانئ نه‌نجامین نه‌ریی ل سه‌ر پیزانینین تیوری و پيشه‌برنا شیانین کاری د واری قه‌سته‌را میزهرۆیی یا ژنان دا هه‌ن.

الخلاصة الخلفية

القسطرة البولية النسائية عملية تمريضية شائعة الاستخدام في المستشفيات. وادخال القسطار بطريقة غير مناسبة لعملية القسطرة البولية عادة يؤدي الى اصابة الاحليل ويزيد من خطورة التهابات الجهاز البولي. ان تعليم وتدريب الممرضات يضيفي مهارات مبنية على المعلومات التي من شأنها التقليل من المضاعفات المصاحبة للقسطرة البولية.
طريقة البحث:

نمط الدراسة التجريبية مبني على اجراء اختبار قبل وبعد البرنامج التدريبي والذي اجري في مستشفى الولادة في دهوك. اخذت عينة مناسبة مكونة من 31 ممرضة من وحدات مختلفة داخل المستشفى لبيان دور البرنامج التدريبي وقد استخدمت في البحث استمارة استبيان للمعلومات مع قائمة اكتساب المهارات العملية لجمع البيانات.
النتائج:

وفقا لنتائج الدراسة ان 45,2% من الممرضات لديهن خبرة من سنة الى خمس سنوات مع شهادة دبلوم في التمريض. ان الممرضات اللواتي تم اختبارهن قبل البرنامج التدريبي لدى 74,4% منهن مستوى منخفض من المعرفة النظرية بينما اظهرت نتيجة الاختبار بعد البرنامج التدريبي حوالي 83,9% لديهن معرفة جيدة وذلك من تأثير البرنامج التدريبي. ومن ناحية اخرى حوالي 93,8% من الممرضات اظهرن مستوى اداء منخفض للقسطرة البولية قبل التدريب بينما اصبح مستوى اداء كل الممرضات جيدا بعد البرنامج التدريبي ولا توجد اي علاقة بين المعرفة النظرية والمهارات العملية مع الخصائص المهنية الديموغرافية, وتوجد علاقة بين المهارات وسنوات الخبرة.
الاستنتاج: البرامج التدريبية لها نتائج ايجابية على المعلومات النظرية واداء المهارات العملية في ما يخص القسطرة البولية النسائية.