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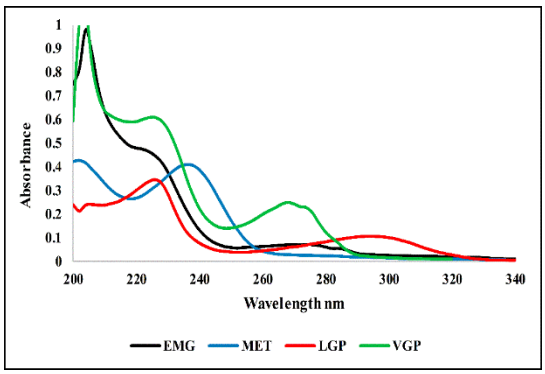

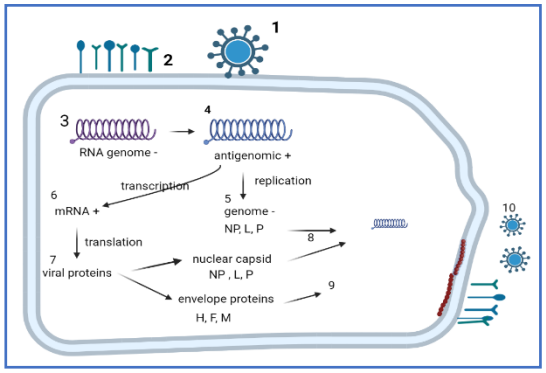

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Assessment of Nurses' Knowledge and Practice Regarding Aseptic Technique procedure of Urinary Catheterization in Sulaimani, Iraq

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Abstract

Background: Urethral catheterization is a vital basic skill which not learnt properly will lead to numerous complications, **Objectives:** to assess nurses' knowledge and practice regarding aseptic technique procedure of urinary catheterization, **Materials and methods**: A cross-sectional descriptive design study utilized to assess nurses' knowledge and practice regarding aseptic technique procedure of urinary catheterization at Shar Teaching Hospital, a non-probability (convenient) sampling was used to select the study participants, the study sample included (100) nurses those working in Shar Teaching Hospital, the study was conducted from September, 2022 to July, 2023. Data were collected using a self-administered questionnaire and observational checklist, Study instruments consist of three parts, first one the nurse information tool, which consists of questions about the demographic characteristics of the nurse, second one constructed to evaluate nurses' knowledge about urinary catheterization. The third one consists of observational checklist about nurses' practices related to urinary catheterization procedure, **Result:** the results demonstrate that statistically significant associations were found between nurses' knowledge regarding aseptic technique in urinary catheterization procedure of the study sample with years of nurses' experience and graduation level (p-value=0.034, 0.044), Also, consequences show that no statistically significant relations were found between nurses' knowledge with all other socio demographic characteristics except gender that the results demonstrate that statistically significant associations were found between nurses' practice with nurse gender (p-value=0.034)m There was statistically significant correlation between knowledge and practice that correlation (R) value was (0.043). **Conclusions:** Overall, we observed at Shar Teaching Hospital that: more than half of nurses had a fair level of knowledge and practice toward urinary catheterization procedure that adhered to the published guidelines, there were significant associations between nurses' knowledge and years of nurse experience and degree, according to capacity building through training programs for knowledge and practice further about urinary catheterization is advised.

Introduction

One typical invasive procedure is urinary catheterization, which involves inserting a tube into the bladder to drain pee outside **[1]**. The tube at issue has a short- and long-term usable life **[2]**. Urinary tract infections (UTIs) are caused by aberrant bacteria found in the urinary system, which makes it one of the most significant

systems in the body **[3]**. In clinical contexts, it is an essential and crucial technique for patient management. Every year, about 100 million IUCs are used worldwide, accounting for 16–33% of all **[4, 5]** at least one urine catheterization occurs while a patient is in the hospital **[6]**. Numerous infectious and non-infectious problems can arise with an IUC, such as purulent urethritis, urethral strictures, mechanical trauma, nonbacterial urethral inflammation, bladder urolithiasis, and catheter-associated urinary tract infections (CAUTI) **[7]**.

The microorganism may pass through the urinary tract in two ways the extra luminal route or the intraluminal route from a contaminated urine collection bag or the junction between a catheter and drainage tube. This movement occurs when the microorganisms travel along the external surfaces of the urethral mucous sheath, for example throughout catheter insertion without utilizing the aseptic technique **[8, 9]**. So care should be taken to preserve the catheter's cleanliness and bacterial-free state. Urinary catheter users should receive thorough training in the procedure from a licensed healthcare provider. For a variety of reasons, urinary catheterization is becoming a standard nursing treatment in hospitals. It could be utilized by patients undergoing renal transplantation, post-major procedures (head injuries, heart disease, etc.), and patients with serious illnesses who need close monitoring for the output of urine **[10]**. A new catheter care unit from Nursing Times Learning focuses on using urinary catheters safely and appropriately to lower infection risks for patients. Additionally, there is no established strategy for managing to keep an eye on the presence of unneeded urinary catheters, and the majority of nurses are ignorant of the indications for catheterization **[11]**.

A flexible plastic tube called an indwelling urinary catheter is placed into the bladder and stays there to enable continuous urine drainage. The Foley indwelling catheter, which has a balloon on the bladder end, is the most common variety. To prevent the Foley catheter from pulling out of the bladder, air or fluid is pumped into the balloon after it has been implanted. All that needs to be done for removal is to deflate the balloon and remove the catheter. Urine retention alleviation and urine monitoring are two reasons why a catheter might be used **[12]**. The current study aimed to evaluate the knowledge and practice of nurses regarding the aseptic technique and evaluate the knowledge and practice of nurses regarding the aseptic technique in urinary catheterization.

Materials and methods

Study design and study population

This descriptive cross-sectional and observational study design was conducted to explore the level of nurse s knowledge and practices regarding urinary catheterization procedure at Shar Teaching Hospital. A non-probability (convenient) sampling was used to select the study participants. The study sample included (100) nurses those working in teaching hospital. The study was conducted from September, 2022 to July, 2023. Data were collected using a self-administered questionnaire and observational checklist. Study instruments consist of three parts. Part 1 of the nurse information tool, which consists of questions about the demographic characteristics of the nurse. Second part was constructed to evaluate nurses' knowledge about urinary catheterization procedure, the third part consists of observational checklist about nurses' practices related to urinary catheterization procedure.

Inclusion criteria:

a) Nurses are available during data collection.

b) Nurses who directly perform urethral Catheterization.

c) Both genders.

d) Nurses from different educational levels.

Exclusion criteria:

a) Nurses who have less than one year of experience.

b) Volunteer nurse.

Sampling was conducted in Shar Teaching Hospital and Sample size was 100 nurses in 4 different parts.

Ethical consideration the proposal was approved by the ethical committee in College of Medicine/ University of Sulaimani and the Formal consent was obtained from all participants and they were informed that they have the right to withdraw from the study when they want prior to the survey.

Instrument

The researcher constructed the questionnaire to evaluate the nurses' information and practice concerning aseptic technique in urinary catheterization procedure in Shar Teaching Hospital in (medical emergency, surgical emergency, medical and neurology ward), the questionnaire composed of two parts: first one the socio-demographic data about nurses such as (age, gender, marital status, level of education, monthly income, and experience), Second one section A includes (8) questions concerning knowledge and section B (25) items concerning practice that should be provided by the nurse during urinary catheterization procedure.

Data collection

A Researcher clarified the aim of the study to nurses and achieved verbal consent for the questionnaire to be filled out. The questionnaire form was dispersed to the nurses as a hard copies in the English language for the knowledge domains, the researcher used direct interviews face to face for about 10 minutes. However, regarding the practice domain, the researcher uses a standardized checklist to observe nurses while performing urethral catheterization without informing them.

Statistical analysis

The Statistical Package for Social Sciences (SPSS version 22) was used to examine the collected and coded data. Calculations were made using descriptive statistics like frequency and percentage. Continuous variables were described using central tendency and dispersion around the mean measures. To find statistically significant relationships between categorical dependent and independent variables, chi-square was employed with a 95% confidence interval for categorical variables. If the P value was less than 0.05, it was deemed significant.

Results

In Table 1, the study's findings revealed that participants' mean age was determined to be (31.9± 6.90). Most of the participants 47.0% were aged amongst (20-30 years). About gender of the nurse's characteristics of the study result indicates that the majority of the participants were female 67.0%, and male with 33.0%, percentage. Concerning marital status, the majority of the respondents were married which accounted for 59.0% ,also the table show that 66% of the participants had sufficient economic status, regarding the distribution of the experience of nurse, the majority of the nurses had (6-10) years of experience about 68.0%, According training course, 5.0%, of them took training course, about the place of working 47%, of them in medical emergency department. Also the table show "Educational level" that most of the studied respondents had diploma degree in nursing 58.0%.

Table 1. Distribution of nurse's according to socio-demographic characteristics

Socio-demographic characteristics		Frequency (F)	Percentage (%)
Age	20-30 years	47	47.0
	31-40 years	36	36.0
	>40 years	17	17.0
Mean± SD 31.9± 6.90			
Gender	Male	33	33.0
	Female	67	67.0
Marital status	Married	59	59.0
	Single	41	41.0
Economic status	Sufficient	66	66.0
	Barely sufficient	21	21.0
	Insufficient	13	13.0
Years of experience	1-5 years	9	9.0
	6-10 years	68	68.0
	>10 years	23	23.0
Training course	Yes	5	5.0
	No	95	95.0
Place of working	Medical ward	11	11.0
	Neurological ward	13	13.0
	Surgical emergency department	29	29.0
	Medical emergency department	47	47.0
Graduation	Diploma	58	58.0
	Bachelor	40	40.0
	Post graduate	2	2.0
Total		**100**	**100**

SD: standard deviation

Table 2 explores the nurses' level of knowledge about aseptic technique in urinary catheterization procedure of the study samples. However, the result showed that the average mean value of knowledge was between 1.00- 0.03. Among 8 items of knowledge, 1 item with the mean 0.51 indicates a moderate level of knowledge, the other 5 items which their means are 0.83, 0.83, 0.74, 0.93, and 1.00 indicate a high level of knowledge.

The respondents with 2 items had a low level of knowledge. The total mean and standard deviation of the knowledge about aseptic technique in urinary catheterization procedure of the study samples were 5.21±1.06.

Table 2. Distribution of nurses' level of knowledge regarding aseptic technique in urinary catheterization procedure

Nurses' Knowledge	**N=100**				
	Groups	**F**	**%.**	**MS**	**Level**
Read the following statement carefully and select the proper technique used for indwelling urinary catheter Insertion	Correct	83	83.0	**0.83**	**H**
	Incorrect	17	17.0		
Operative patients who have been catheterized, it is advised to remove the catheter as soon as possible post operatively, preferably within …….	Correct	51	51.0	**0.51**	**M**
	Incorrect	49	49.0		
What do you do if there is resistance in male patient?	Correct	93	93.0	**0.93**	**H**
	In correct	7	7.0		
In male patient if you see blood in the urethral meatus:	Correct	100	100	**1.00**	**H**
	Incorrect	0	0		
The most suitable lubricant for catheter:	Correct	33	33.0	**0.33**	**L**
	Incorrect	67	67.0		
What is the absolute contraindication of urethral catheterization?	Correct	3	3.0	**0.03**	**L**
	Incorrect	97	97.0		
How many time need to exchange the catheter (latex type)?	Correct	83	83.0	**0.83**	**H**
	Incorrect	17	17.0		
How many time need to exchange the catheter (silicone type)?	Correct	74	74.0	**74.0**	**H**
	Incorrect	26	26.0		
Total Mean ± SD	**5.21±1.06**				

MS: Mean of score H: High effect M: Moderate effect L: Low effect SD: standard deviation

Table (3) revealed the overall nurses' knowledge regarding aseptic technique in urinary catheterization procedure of the study samples. Most of the participants had good knowledge which accounted for 43.0%, while, 55.0% of them had fair knowledge, and 2% of the participants had poor knowledge about aseptic technique in urinary catheterization procedure.

Table3. Overall nurses' knowledge toward aseptic technique in urinary catheterization procedure

Overall knowledge	**N=100**	
	F	**%**
Poor knowledge	2	2.0
Fair knowledge	55	55.0
Good knowledge	43	43.0

Table (4) shows the nurses' level of practice about the aseptic technique in urinary catheterization procedure of the study sample. However, the result showed that the average mean value of practice ranged between 1.00-3.00. Among 25 items of practice, 14 items with the means 2.81, 2.91, 3.00, 2.76, 2.69, 2.60, 2.82, 2.65, 3.00, 2.60, 2.93, 2.76, and 2.77 indicate a high level of practice. The other 5 items, which their means are 2.05, 1.72, 2.11, 2.02, and 1.98, indicate a moderate level of practice. Other respondents with the means 1.66, 1.35, 1.45, 1.52, 1.00, and 1.00, have a low level of practice about aseptic technique in urethral catheterization of the study samples, were (57.0±2.76).

Table 4. Distribution of nurses' level of practice regarding the aseptic technique in urinary catheterization procedure of the study samples

Nurses' practice	**Groups**						**MS**	**Level**
	Done correctly		**Done incorrectly**		**Not done**			
	F	**%**	**F**	**%**	**F**	**%**		
Self-introduction	31	31.0	4	4.0	65	65.0	**1.66**	**L**
Explain procedure to the patient	47	47.0	4	4.0	49	49.0	**1.98**	**M**
The bed is screened to ensure privacy	87	87.0	7	7.0	6	6.0	**2.81**	**H**
Ensure adequate light source	14	14.0	74	74.0	12	12.0	**2.02**	**M**
Perform hand hygiene	9	9.0	17	17.0	74	74.0	**1.35**	**L**
The equipment is prepared properly	91	91.0	9	9.0	0	0	**2.91**	**H**
Prepare the patient in position	93	93.0	5	5.0	2	2.0	**2.91**	**H**
Wear clean gloves	100	100.0	0	0	0	0	**3.00**	**H**
Test the balloon	19	19.0	7	7.0	74	74.0	**1.45**	**L**

Apply drapes	16	16.0	19	19.0	65.	65.0	**1.52**	**L**
Clean the perineum area	0	0	0	0	100	100	**1.00**	**L**
Wear sterile gloves	37	37.0	37	37.0	26	26.0	**2.11**	**M**
Use chlorhexidine solution as disinfectant for cleaning	79	79.0	18	18.0	3	3.0	**2.76**	**H**
Clean meatus to the base of the penis	69	69.0	31	31.0	0	0	**2.69**	**H**
Use 2% xylocaine gel for lubrication	60	60.0	40	40.0	0	0	**2.60**	**H**
Use a single used bottle for lubricant	23	23.0	26	26.0	51	51.0	**1.72**	**M**
For both genders insert lubrication into the urethra by a sterile syringe	41	41.0	23	23.0	36	36.0	**2.05**	**M**
Allow 5 to 10 minutes for anesthetic effect	91	91.0	0	0	9	9.0	**2.82**	**H**
Insert catheter into meatus upward approximately 30 degree angle until urine begins to flow (female) ,	–	–	–	–	–	–	**–**	**–**
Insert catheter 90 degree and apply constant gentle pressure (male)	73	73.0	19	19.0	8	8.0	**2.65**	**H**
Inflate the balloon using distilled water to the volume recommended	100	100.0	0	0	0	0	**3.00**	**H**
Assess patient's expression	71	71.0	18	18.0	11	11.0	**2.60**	**H**
Place the urine bag in the proper position	93	93.0	7	7.0	0	0	**2.93**	**H**
Care of equipment post insertion	77	77.0	23	23.0	0	0	**2.77**	**H**
Perform hand hygiene	81	81.0	14	14.0	5	5.0	**2.76**	**H**
Documentation	0	0	0	0	100	100.0	**1.00**	**L**
Total Mean ±SD	**57.0±2.76**							

MS: Mean of score H: High M: Moderate L: Low

Table (5) revealed that overall nurses' practice regarding aseptic technique in urinary catheterization procedure of the study samples. Most of the participants were had fair practice which accounted for 54.0%, while about 46.0% of them had good practice about aseptic technique in urinary catheterization procedure of the study samples.

Table 5. Overall nurses' practice regarding aseptic technique in urinary catheterization procedure of the study samples.

Overall practice	N=100	
	F	%
fair practice	54	54.0
Good practice	46	46.0

Table (6) revealed the relationship between sociodemographic traits and overall nurses' knowledge regarding aseptic technique in urinary catheterization procedure of the study samples, The results determine that statistically significant associations were found among knowledge of nurses with years of experience and graduation level, p-value=0.034, 0.044).

Table 6. Relationship between sociodemographic traits and nurses' knowledge regarding urinary catheterization procedure.

Variable		Knowledge scores			Total	P-value
		poor	Fair	Good		
		Number, %				
Degree	Diploma	1(1.7)	35(60.3)	22(37.9)	58(100)	0.044
	Bachelor	1(1.5))	19(47.5)	20(50.0)	40(100)	
	Post graduate	0(0.0)	1(50.0)	1(50.0)	2(100)	
Total		2(2.0)	55(55,0)	43(43.0)	100(100)	
Years of experience	1-5	1(11.1)	4(44.4)	4(44.4)	9(100)	0.034
	6-10	1(1.5)	34(50.0)	33(48.5)	68(100)	
	>10 years	0(0.0)	17(73.9)	6(26.1)	23(100)	
Total		2(82.0)	55(55.0)	43(43.0)	100(100)	

Table 7. Revealed the association between socio-demographic characteristics and overall nurses' practice regarding aseptic technique in urethral catheterization of the study samples, the results demonstrate that statistically significant associations were found between nurses' practices with nurse's genders (p-value=0.034).

Table 7. The association between nurses' sociodemographic characteristics and their practice scores.

Variable		Practice scores		Total	P-value
		Fair	Poor		
		Number, %			
Gender	Male	23(69.7)	10(30.3)	33(100.0)	0.034
	Female	31(46.3)	36(53.7)	67(100.0)	
Total		54(54.0)	46(46.0)	100(100.0)	

Table (8) the relationship between the total knowledge and practices scores among nurses**,** about aseptic technique in urinary catheterization procedure of the study sample, there was statistically significant correlation between knowledge and practice.

Table 6. Relation between overall knowledge with overall practice about aseptic technique in urinary catheterization procedure of the study sample.

Variables	N	R	P-value
Nurses' knowledge regarding aseptic technique in urinary catheterization procedure of the study sample.	**100**	**0.043 Significant**	**0.670 Not Significant**
Nurses' practice regarding aseptic technique in urinary catheterization procedure of the study sample.	**100**		

Discussion

This study about the knowledge and practices of nurses regarding aseptic technique in urinary catheterization procedure in four departments of Shar Teaching Hospital.

Based on my main finding: Regarding the knowledge of nurses about aseptic technique in urinary catheterization procedure of the study sample, less than half of the participants had good knowledge which accounted for 43.0%, while 55.0% of participants had fair knowledge. Our findings are inconsistent with **[13]** Who conducted study about nurses' 'total knowledge about urinary tract infection and urinary catheterization, that more than third of the studied nurses had good knowledge, while about half of the studied nurses had poor knowledge about urinary tract infection and urinary catheterization .This low score of knowledge may be due to that more than half of the studied nurses didn't attended training courses about urinary tract infection and urinary catheterization.

Regarding the practice, the overall nurses' practice regarding aseptic technique in urinary catheterization procedure of the study sample. Most of the participants had fair practice, which accounted for 54.0%, while 46.0% of the study samples had good practice. These findings are inconsistent with the study by **[14]** who reported that more than two thirds of the studied sample had satisfactory practice level in maternity nurses concerning urinary tract infection in women receiving urinary catheterization.

The results determine that statistically significant associations were found between nurses' knowledge regarding aseptic technique in urinary catheterization procedure of the study samples with years of nurse

experience and graduation level. This result is in line with study by **[15]** regarding the studied nurses' years of experience. When compared to professionals with less than five years of experience, the majority of respondents 62% who have worked in the field for more than five years perform at an excellent level. The conclusion that respondents with more years of experience and older ages performed at a higher level may be the result of their combined experiences and skill set. This is in line with finding of **[16]** that nurses with at least four years of experience should be expected to understand the fundamentals of best practices for managing indwelling urinary catheters **[17]**.

The result indicated that nurses' clinical characteristics no statistically significant relations were found between nurses' knowledge regarding aseptic technique in urinary catheterization procedure of the study samples including age, marital status, economic status, the study revealed that there is statistically significant associations were found between nurses' practice of the study sample, with nurse gender that female more accurate than male, this is due to the fact that the registration system in nursing colleges and institutes give preference to female students to study in nursing field and on the other hand, still some of the male students are not willing to study nursing, there was statistically significant correlation between knowledge and practice.

Current study revealed that there is no any documentation about the procedure in those four different departments (surgical emergency, medical emergency, neurological and medical ward), also there is no urinary catheterization package or kit.

The Results emphasize that the mean age of the study participants was (31.9± 6.90). Most of the participants 47.0% were aged between (20-30 years), As well as analysis of the nurse's characteristics of the study result indicates that the majority of the participants were female 67.0% as indicated in Table 1, In terms of educational background, the majority of nurses 58.0% held a diploma in nursing, while the remainder 40.0% had bachelor's degrees in nursing and 2.0% postgraduate, respectively.

Conclusions:

Overall, observed data at Shar Teaching Hospital revealed that: more than half of the nurses had fair level of knowledge and practice toward urinary catheterization procedure that adhered to the published guidelines. There were significant associations between nurses' knowledge with years of nurses' experience and graduation level, also there was statistically significant correlation among knowledge and practice, so there was statistically significant associations were found between nurses' practice with gender, there for seminars symposiums, workshops and training course for nursing staff about nursing procedures was recommended, and the most important things are documentation about the procedure and urinary catheterization package.

Conflict of Interest

The authors declare no conflicts of interest regarding this manuscript's publication and/or funding.

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