MOSUL JOURNAL OF NURSING
Online ISSN: 2663-0311 - Print ISSN: 2311-8784
Website: https://mjn.mosuljournals.com

RESEARCH ARTICLE

Nursing Practices toward Prevention of Indwelling Catheter Associated Urinary Tract Infection: An Interventional Study for nursing staff

Ahmed Barid Kayem [1], Hakima Shakir Hassan [2] *

1. *Academic Nurse, Ministry of Health/ Al-Diwaniya Health Directorate, Iraq.*
2. *Assist. Prof, Adult Nursing/ College of Nursing University of Baghdad, Iraq.*

Corresponding author: Ahmed Barid Kayem
Email: ahmedbread999@gmail.com

ORCID

ABSTRACT
Background: *The placement of a urinary catheter is the single most important predisposing factor for Catheter-associated Urinary Tract Infections, which causes significant morbidity in hospitalized patients, including pain, fever, and malaise. Urinary tract infections are responsible for around 13,000 fatalities each year. Catheter-associated Urinary Tract Infections complications lead to an increase in length of stay, patient pain, higher healthcare expenses, and death. Urinary tract infections are the second most frequent illness after respiratory infections. This has an impact on patients' health outcomes and periods of hospital stay. The aim of this study is to improve nurses' practices by involving them in an interventional program after assessing nurses' practices regarding preventing male catheter-associated urinary tract infections.* ***Methods:*** *A pre-experimental design had been applied with the use of one group pre-test/post-test design of samples of 45 nurses to assess of nursing staff's practices toward the prevention of indwelling catheter-associated urinary tract infection in Al-Diwaniyah Teaching Hospital. The reliability of the questionnaire was achieved through a pilot study and then presented to experts to prove its validity. The total number of items included in 15 items distributed on two domains in the observational checklist for nurses' practices. The data was collected by using the semi-structured interview and analyzed by the application of a descriptive and inferential statistical data analysis approach.* ***Results:*** *there were highly significant statistical differences between pre and post-program at p<0.001for nurse's practices about nursing staff practice about urinary catheter insertion and practice about catheterization follow up to preventing Indwelling Catheter-Associated with Urinary Tract Infections in Pre and Post Program. And the results showed there is no significant statistical correlation between knowledge and practices with nurse's age and years of experience at a p-value of > 0.05.* ***Conclusions:*** *The study results accepted the alternative hypotheses and an interventional program has a significant effect on nursing staffs' practices about preventing Indwelling Catheter-Associated with Urinary Tract Infections. The study confirmed that prior to the interventional program; the nurses had erroneous practices about preventing indwelling catheter-associated urinary tract infections. The study showed that the interventional program positively affected the nurse's practices concerning preventing indwelling catheter-associated with urinary tract infections training.*

Keywords: Nursing Practices, Indwelling Catheter, Urinary Tract Infection.

Received: 14 April 2022, Accepted: 08 June 2022, Available online: 28 August 2022.

INTRODUCTION

Urinary catheters are frequently used to manage such things as perfecting urine output in intensive conditions, improving the rest of severely ill patients, and catheterization also helps to control skin breakdown caused by urinary incontinence, while other methods and uses for keeping the constant voiding of urine for surgical patients are ineffective (Shehab, 2017).

The single most important predisposing factor for (CAUTI) is the installation of a urinary catheter, which produces severe morbidity in hospitalized patients, including discomfort, fever, and malaise (Coleman, 2017). Every day that an indwelling urinary catheter is in place, it increases the risk of infection by 3% to 7%. CAUTIs are common, dangerous, and costly; around a quarter of all hospitalized patients are catheterized at least once a year, and 10% develop urinary tract infections (Lo et al., 2017). On a yearly basis, CAUTI is associated with more than 75% of these UTIs all over the world. Over 1.7 million patients are affected by UTIs, which account for 32 to 40% of all hospital-acquired infections (Clarke et al., 2013).

Each year, over 13,000 people die as a result of UTIs. HCAIs kill more people than breast cancer, AIDS, and car accidents put together. On the other hand, most HCAIs may be prevented. CAUTI is the most common kind of HCAI. CAUTI complications result in a longer hospital stay, more patient suffering, greater health-care costs, and mortality (Chant et al., 2011). As a result, understanding CAUTI risk factors, such as catheterization length, advanced age, male sex, and weakened immunity, is crucial in order to propose CAUTI prevention strategies (Verma et al., 2017). Approximately half of all adult guys get at least one UTI. UTIs are the second most common ailment after respiratory infections, accounting for around 5% of general practice appointments (Fashafsheh et al., 2015).

In Iraq, many male patients suffer from UTIs that result from IUC due to poor nursing performance which depends on their practices. This has an impact on patients' health outcome, and period of hospital staying. Therefore, thus study concerns the effectiveness of nursing interventional program through assessing of nursing staffs' practices through the utilization of practice checklist in Al-Diwaniya Province/ Iraq.

METHOD

The pre-experimental design had been applied with the use of one group pre-test/post-test was approach 45 nurses to examine the effectiveness of the nursing interventional program through assessing of nursing staffs' practices through the utilization of practice checklist

Study instrument: The questionnaire is one of the means to help collect data that contribute to achieving the results expected by the study, so the researcher designed this questionnaire, which aims to clarify the study objectives and significance to evaluate nursing staffs" practices toward prevention of indwelling catheter associated urinary tract infection. This questionnaire consists of two for parts which includes the following:

Part I: This section composed of socio-demographic information which includes age, gender, educational level, social status, and years of experience in nursing and training courses

Part II: This part was constructed to assess the nurses' practices were observed during the morning, and night shifts. The observational checklist for nurses' practices was composed of (15) items distributed on two domains, these items were rated based on the Likert scale; (3) always; (2) sometimes; (1) never.

Content validity was determined by the study tools, which include the interventional program, the knowledge form, and the observational checklist, was determined by (12) experts, who have more than 10 years of experience in their fields, to verify the interventional program contents, nurses' practices checklist toward prevention of indwelling catheter-associated urinary tract infection. Reliability of the questionnaire (tools) was determined through the use of test and re-test approach obtained through evaluating 5 nurses selected from Al-Diwaniya Teaching Hospital and the interval period was four weeks. Reliability Coefficient revealed that (0.95) respectively of the knowledge test and (0.91) respectively of the practice test.

The data were analyzed using (SPSS) version 21 application of statistical analysis system. The information was evenly distributed. Frequencies, Percentages, Mean and Standard Deviation, Pearson's Correlation Coefficients, T-test (paired sample t-test) to determine the mean difference between the nurses' practices at two levels of measurements (pre-test and post-test), and Analysis of variance (One Way-ANOVA) to determine the association between the nurses' practices and some demographic characteristics. Statistical significance was defined as a p 0.05.

RESULTS

Table 1 revealed that age of nurses (45) for a quasi-experimental design study at most 66.7% was from twenty to twenty nine years with Mean ± SD 30.68 ± 7.351. According to gender, the all participants were male. A high percentage (n=28; 62.2%) of nurses are graduating from a nursing institute. Regarding the years of experience in nursing were with Mean ± SD 7.17 ± 7.043. A more than fifty percent (n=26; 57.8%) of nurses were married. According to the training course the most nurses attended a training course with percentage (n=18; 40%) respectively just one time inside the Iraq, and form them 24.4% for one week and 15.6% more than one week.

Findings demonstrated in table 2 the evaluation of Nurse's practices preventing Indwelling Catheter-Associated with Urinary Tract Infections in Preprogram were poor practices while in Post program were high practices. Also the results showed there were highly significant statistical differences between pre and post program at p< 0.001for nurse's practices about preventing Indwelling Catheter-Associated with Urinary Tract Infections in Pre and Post Program for the Study Group in Al-Diwaniyah Teaching Hospital.

Findings demonstrated in table 3 there in no significant statistical differences between practices with nurse's education level at p- value > 0.05. And the results showed there in no significant statistical correlation between practices with nurse's age and years of experience at p- value > 0.05.

Table 1. Participants Demographics Characteristics

Demographic Characteristics	Variables	Study Group (n=45)	
		f.	%
Age	20 – less than 30 years	30	66.7
	30 – less than 40 years	8	17.8
	40 – less than 50 years	5	11.1
	50 years and above	2	4.4
	Total	45	100.0
	Mean ± SD	**30.68**	**± 7.351**
Gender	Male	45	100.0
	Female	0	0
	Total	45	100.0
Education level	Nursing secondary school	10	22.2
	Nursing Institute	28	62.2
	Nursing Bachelor	7	15.6
	Postgraduate	0	0
	Total	45	100.0
Social Status	Married	26	57.8
	Single	18	40.0
	Widowed	0	0
	Divorced	0	0
	Separated	1	2.2
	Total	45	100.0
Years of experience	1- less than 6 years	29	64.4
	6- less than 16 years	9	20.0
	16- above	7	15.6
	Total	45	100.0
	Mean ± SD	**7.17 ± 7.043**	
Training course	Not participate	27	60.0
	One	18	40.0
	Two	0	0
	Total	45	100.0
Place	Not participate	27	60.0
	Inside Iraq	18	40.0
	Outside Iraq	0	0
	Total	45	100.0
Duration of the course	Not participate	27	60.0
	One week	11	24.4
	More than one week	7	15.6

	Total	45	100.0

f.: Frequency, No.: Number, %Percentage, M= mean, SD= stander deviation

Table 2. Evaluation and comparison between Pre and Post Tests for the Study Group According to Main Domains of the Nursing staffs' practices in preventing CAUTI.

Main Domains of The Nursing staffs's practice in preventing Indwelling Catheter-Associated with Urinary Tract Infections	Pre Test		Post Test		C.S	
	M	SD	M	SD	t test	P. value
Domain 1: Nursing staff practice about urinary catheter insertion	1.476	.29686	2.692	.28238	-21.967-	.000
Domain 2: Nursing staff practice about catheterization follow up	1.450	.24772	2.652	.26635	-19.780-	.000
Total	1.463	.22122	2.672	.25649	-23.474-	.000

M = Mean of score, S.D=Standard Deviation, Eva=evaluation level, P = poor (1 – 1.66), IN= Intermediate (1.67 - 2.32), H = High (2.33 - 3). Sig.= Significance, N.S=Non-Significant at p>0.05, S= Significant at p<0.05, H.S: High Significant at p<0.001

Table 3. Association between nurses' demographics with their practices in post program about prevention of CAUTI.

Demographics		Sum of Squares	df	Mean Square	F	p. value	Sig.
Age	Between Groups	.876	18	.049	.627	.846	NS
	Within Groups	2.018	26	.078			
	Total	2.895	44				
Education level	Between Groups	.121	2	.061	.917	.407	NS
	Within Groups	2.773	42	.066			
	Total	2.895	44				
Years of experience	Between Groups	.714	14	.051	.701	.756	NS
	Within Groups	2.181	30	.073			
	Total	2.895	44				

P=probability value, NS: Non-Significant at P > 0.05, S: Significant at P < 0.05, HS: Highly Significant at P < 0.01.

DISCUSSION

This study used a purposive clinical trial design to test the effectiveness of nursing interventional program through assessing of nursing staffs' practices through the utilization of practice checklist. The present study samples consist of 45 nurses with age mean ± SD was 30.68 ± 7.351.

The findings of this study are congruent with those of Mukakamanzi, (2017), who conducted a study among nurses over the age of 30 (Mukakamanzil, 2017).

In terms of educational attainment, the most of nurses (28.2 percent) were graduates of a nursing institute.

Wambui's study (2021) that found 42 percent of participants had a diploma (Wambui, 2019).

According to the data, the majority of the research sample was completed at a nursing institute.

In terms of years of experience, the study's findings revealed that the mean SD was 7.17 ± 7.043.

The study included Benny et al., (2020), who conducted a study in Mangaluru among staff nurses with a mean working experience of 6.49 ± 2.37 years (Benny et al., 2020).

The practices observation displayed that the overall evaluation of nurses' practices regarding indwelling catheter-associated with urinary tract infections was low with the statistical mean ± SD (1.463± .221).

After implementing the interventional program, the study revealed a remarkable development in the nursing staff' practices towards preventing indwelling catheter-associated with urinary tract infections, where the overall evaluation of nurses' practices was high with a statistical mean ± SD (2.672 ± .256). That there are highly statistically significant differences between the practices mean scores in pre and post-test (at p value p<0.001), where the practices mean scores in post-test were better than it in the pre-test.

Durant (2017) found a substantial difference between pre-and post-test results in clinical predictors of CAUTI, specifically IUC use, and CAUTI rates (Durant, 2017).

The findings of this study agree with those of Mukakamanzi (2017), who conducted a study that found that nurses had good perceived practice regarding CAUTI prevention (Mukakamanzil, 2017).

The interventional program had a good impact on the nurses' behaviors in terms of avoiding indwelling catheter-associated urinary tract infections, according to the research.

The study revealed that there is no statistically significant correlation between nurses' years of experience in (CCU, RCU and medical and surgical wards) with their knowledge and

practices toward indwelling catheter-associated with urinary tract Infections (at P > 0.05) respectively.
According to Hassan (2018), there is no significant association between nurses' educational levels and their practices (p-value =0.07) (Hassan, 2018).
Chithra and Raju (2017) discovered a statistical association between nurses' expertise and their educational level (p-value =0.033) (Chithra and Raju., 2017).

CONCLUSIONS

Conclusion from the discussion that the study results accepted the Alternative hypotheses and an interventional program has a significant effect on nursing staffs' practices about preventing Indwelling Catheter-Associated with Urinary Tract Infections.
This study revealed that prior to the interventional program, the nurses had erroneous in practice about preventing indwelling catheter-associated with urinary tract infections
This result indicates that the interventional program was effective for almost all age groups
This result indicates that the practices of the nursing staff regarding the indwelling catheter-associated with urinary tract Infections are not affected by years of experience.

ETHICAL CONSIDERATIONS COMPLIANCE WITH ETHICAL GUIDELINES

All experimental protocols were approved by the Al-Diwaniya Health Directorate in Iraq, and all experiments followed the permitted procedures.

FUNDING

This research did not receive any grant from funding agencies in the public, commercial, or non-profit sectors.

AUTHOR'S CONTRIBUTIONS

Study concept, Writing, Reviewing the final edition by all authors.

DISCLOSURE STATEMENT:

The authors report no conflict of interest

ACKNOWLEDGEMENTS

We thank the anonymous referees for their useful suggestions

REFERENCES

Shehab, M.S., 2017. Impact of Protocol of Care of Patients Undergoing Urinary Catheterization on Nurses' Knowledge. International Journal of Caring Sciences, 10(2).

Coleman, J., 2017. Chronic Catheter Associated Complications and Catheter- Associated Urinary Tract Infection. In Pelvic Floor Dysfunction and Pelvic Surgery in the Elderly (pp. 91-103). Springer, New York, NY.

Lo, E., Nicolle, L.E., Coffin, S.E., Gould, C., Maragakis, L.L., Meddings, J., Pegues, D.A., Pettis, A.M., Saint, S. and Yokoe, D.S., 2014. Strategies to prevent catheter-associated urinary tract infections in acute care hospitals: 2014 update. Infection Control & Hospital Epidemiology, 35(5), pp. 464- 479.

Clarke, K., Tong, D., Pan, Y., Easley, K.A., Norrick, B., Ko, C., Wang, A., Razavi, B. and Stein, J., 2013. Reduction in catheter-associated urinary tract infections by bundling interventions. International Journal for Quality in Health Care, 25(1), pp.43-49.

Chant, C., Smith, O.M., Marshall, J.C. and Friedrich, J.O., 2011. Relationship of catheter-associated urinary tract infection to mortality and length of stay in critically ill patients: a systematic review and meta-analysis of observational studies. Critical care medicine, 39(5), pp.1167-1173.

Verma, S., Naik, S.A. and Deepak, T.S., 2017. Etiology and risk factors of catheter associated urinary tract infections in ICU patients. International Journal of Medical Microbiology and Tropical Diseases, 3(2), pp.65-70.

Fashafsheh, I., Ayed, A., Eqtait, F. and Harazneh, L., 2015. Knowledge and Practice of Nursing Staff towards Infection Control Measures in the Palestinian Hospitals. Journal of Education and Practice, 6(4), pp.79-90.

Mukakamanzi, J. (2017). Knowledge, attitude and practices of nurses towards the prevention of catheter-associated urinary tract infection in selected Referral Hospitals in Rwanda (Doctoral dissertation, University of Rwanda).

Wambui, C. M. (2021). Compliance with CDC guidelines for Catheter associated Urinary tract infection prevention among nurses at Embu level 5 Hospital (Doctoral dissertation, Mount Kenya University).

Benny, A. M., Idiculla, A. S., Kunjumon, A., George, A., & Sequera, S. K. (2020). Nurses' Knowledge on Prevention of Catheter-Associated Urinary Tract Infection in a Selected Hospital of Mangaluru. Journal of Health and Allied Sciences NU, 10(03), 128-131.

Durant, D. J. (2017). Nurse-driven protocols and the prevention of catheter-associated urinary

tract infections: a systematic review. American journal of infection control, 45(12), 1331-1341.

Hassan, A. M. A. (2018). Effect of Educational Program on Nurses' practice Regarding Care of Adult Patients with Endotracheal Tube. Port said scientific journal of nursing, 5(2), 142-169.

Chithra, R. A., & Raju, J. (2017) Effect of Structured Teaching Programme on Knowledge Regarding Prevention of Ventilator Associated Pneumonia among Critical Care Nurses .International Journal of Health Sciences & Research 7(7).