Original Research Article

Journal of College of Medical Sciences-Nepal, Vol-21, No.4, Oct-Dec 2025

ISSN: 2091-0657 (Print); 2091-0673 (Online) Open Access
DOI: 10.3126/jcmsn.v21i4.73457

Nurses Knowledge and Practice on Prevention of Catheter Associated Urinary Tract Infection in Selected Teaching Hospital of Pokhara

Aarati Acharya[1], **Pramila Baral**[2], **Anjali Parajuli**[3], **Sita Bhandari**[1], **Manoj Koirala**[4]

[1]Department of Nursing, Manipal College of Medical Sciences, [2]Smart Brains Academy, [3]Department of Nursing, Gandaki Medical College Teaching Hospital and Research Centre Pvt.Ltd, [4]Department of Medicine, Pokhara Academy of Health Sciences.

ABSTRACT

Background

Catheter-associated Urinary Tract Infections (CAUTIs) are among the most common health care-associated infections, making up nearly 40% of all hospital-acquired infections and contributing to around 10% of related deaths. Majority of CAUTIs can be prevented by healthcare workers through proper use of guidelines and strict adherence to aseptic techniques. Thus, this study aimed to assess the knowledge and practice on prevention of catheter associated urinary tract infection among nurses.

Methods

A descriptive cross-sectional study was conducted among 144 nurses at the Gandaki Medical College Teaching Hospital and Research Center Pvt. Ltd, using non- probability purposive sampling technique. Nurses present during data collection and willing to participate were included. Data were gathered through structured self-administered questionnaires after obtaining informed consent, and analyzed using descriptive statistics and Chi-square tests.

Results

The finding of the research study reveals that, only 38.2% nurses had good knowledge while 66.0% nurses had good practice regarding prevention of CAUTI. Significant association of knowledge was found with working unit (p-value=0.007) and training on CAUTI prevention (p-value=0.000). Conversely, no significant association was found between knowledge and age, educational level, work experiences and exposure to patient with CAUTI.

Conclusions

The study concluded that while less than half of the nurses had good knowledge about CAUTI prevention, more than half demonstrated good practices. So, to overcome the gap between knowledge and practice regarding prevention of CAUTI and to enhance the quality nursing care, health care setting should focus on better educational intervention through pre course and in-service training.

Keywords: catheter-associated urinary tract infection; knowledge; practice; nurses.

Correspondence: Mrs. Aarati Acharya, Department of Nursing, Manipal College of Medical Sciences, Pokhara, Kaski, Nepal. Email: aaratiacharya7@gmail.com, Phone: +977-9846031540. **Article received**: 2025-04-16. **Article accepted**: 2025-08-12. **Article published**: 2025-12-28.

INTRODUCTION

Catheter-associated urinary tract infections (CAUTIs) are among the most common healthcare-associated infections, accounting for nearly 40% of all hospital-acquired infections worldwide and affecting over 150 million people annually. They are a leading cause of secondary bloodstream infections from urinary sources, with an estimated 10% mortality rate.[1,2,3] In developing countries like Nepal, the prevalence remains high due to limited resources and weaknesses in the healthcare system.[4] Most CAUTIs are preventable through proper guideline adherence and aseptic techniques by healthcare workers.[4] Evidence has shown that nurse's proper intervention for catheter insertion, care and removal produce a significant improvement in patient with CAUTI.[5,6] Inadequate catheter care can lead to serious complications increasing patient discomfort, hospital stays, costs, and mortality.[4] In this context thus the study aims to assess the knowledge and practice on prevention of catheter associated urinary tract infection among nurses in selected teaching hospital of Pokhara.

METHODS

A descriptive cross-sectional study was carried out on a sample of 144 nurses who were working on different departments of Gandaki Medical College Teaching Hospital and Research Center Pvt. Ltd (GMCTHRC) from August to September 2024. The study adhered to ethical protocols, obtaining clearances from the Institutional Review Committee, Manipal College of Medical Sciences (Ref. No. 1296), written permission for data collection from GMCTH administration and also securing verbal informed consent from participants while ensuring anonymity. Non- probability purposive sampling was used to select the sample. Nurses who were present during the time of data collection and who were willing to participate were included in the study. Data was collected after informed consent through structured self- administer questionnaires which was developed by researcher based on related literature review, and peer review. The instrument was divided into 3 parts. Part I contains questions related to socio-demographic variables and profession related variables. Similarly, Part II contains questions related to knowledge regarding prevention of catheter-associated urinary tract infection. There were 18 Multiple choice questions. Every correct answer was given one point, and wrong answer was given zero. Level of knowledge is categorized as good knowledge and poor knowledge. The score of 71% and above is considered good knowledge while less than 71% is considered poor knowledge.[9] Part III contains questions related to practice regarding prevention of catheter-associated urinary tract infection. It was assessed using 12 dichotomous scale questions which consist of 7 positive phrased questions being 'Yes" the correct answer and 3 negative phrased questions having 'No' the correct answer. Score of '1' was awarded to the correct response and '0' was awarded to the incorrect response accordingly. A score equal or above mean value was indicated as good practice whereas a score below mean value was considered poor practice.[10]

Data was collected after informed consent through structured self- administer questionnaires. Obtained data were analyzed by using descriptive statistics like frequency, percentage, mean and standard deviation. Inferential statistics chi-square test was used to find out the association between knowledge on prevention of catheter associated urinary tract infection and selected variables. The level of significance was considered at 5% with p-value <0.05 and 95% confidence interval.

RESULTS

Of the 144 nurses enrolled, 83(57.60%) nurses were below the 25-age group with a mean age of 24.93 ± 3.9 years. Regarding educational level, 97 (67.40%) were PCL nursing (Table 1).

Table 2 shows that 66(45.80%) nurses had 1 year to less than 3 years of work experiences and nearly equal nurses were enrolled from general ward 73(50.7%) and specialized ward 71 (49.30%). Similarly, 107(74.3%) nurses had been exposed to a patient with CAUTI and only 32(22.2%) nurses had attended training regarding prevention of CAUTI.

Table 1. Socio-demographic variables of nurses. (n=144)	
Variables	**Frequency (%)**
Age (years)	
<25	83(57.60)
25-29	44(30.60)
≥30	17(11.80)
Mean ± SD = 24.93 ± 3.74	
Educational Level	
Bachelor Nursing	41(28.50)
PCL Nursing	97(67.40)
ANM	6(4.20)

Table 2. Profession related variables of nurses. (n=144)	
Variables	**Frequency (%)**
Work Experience	
< 1 Year	42(29.20)
1 to < 3 Years	66(45.80)
≥3 Years	36(25.00)
Working Unit	
General Ward	73(50.70)
Specialized Ward*	71(49.30)
Exposure to Patient with CAUTI	
Yes	107(74.30)
No	37(25.70)
Training Attended on Prevention of CAUTI	
Yes	32(22.20)
No	112(77.80)

**Specialized Ward: Emergency ward, Gynae post-operative ward, Dialysis ward, Medical ICU, Neuro-surgery ICU, Neonatal ICU, Pediatric ICU, Operation theatre.*

Table 3 reveals that 89 (61.80%) nurses had poor knowledge and 55 (38.20%) nurses had good knowledge regarding the prevention of catheter-associated urinary tract infection.

Table 3. Knowledge regarding prevention of catheter associated urinary tract infection among nurses. (n=144)	
Level of Knowledge	**Frequency (%)**
Good Knowledge	55(38.2)
Poor Knowledge	89(61.80)

Table 4 reveals that 95 (66.00%) of nurses had good practice and 49 (34.00%) of the nurses had poor practice regarding the prevention of catheter-associated urinary tract infection.

Table 4. Practice regarding prevention of catheter-associated urinary tract infection among nurses. (n=144)	
Level of Practice	**Frequency (%)**
Good Practice	95(66.00)
Poor Practice	49(34.00)

Mean value = 10.17

Table 5 shows that there is statistically significant association between nurse's knowledge and their working unit (p=0.007) and training attended on prevention of CAUTI (p=0.000). While there were no significant association between nurse's knowledge and their age, educational level, work experience, exposure to patient with CAUTI and availability of guidelines for prevention of CAUTI.

Table 5. Association between knowledge and selected variables. (n=144)			
Variables	**Level of Knowledge**		***p*-value**
	Poor n(%)	**Good n(%)**	
Age in Year			
<25	56(38.90)	27(18.80)	0.206
25-29	25(17.49)	19(13.20)	
≥30	8(5.6)	9 (6.20)	
Educational Level			
Bachelor Nursing	23(16.00)	18(12.50)	0.448
PCL Nursing/ANM	66(45.80)	37(25.70)	
Work Experience			
General Ward	53(36.80)	20(13.90)	0.007
Specialized Ward	36(25.00)	35(24.30)	
Exposure to Patient with CAUTI			
Yes	61(42.40)	46(31.90)	0.051
No	28(29.40)	9(6.20)	
Training Attended on Prevention of CAUTI			
Yes	10(6.90)	22(15.30)	<0.05
No	79(54.90)	33(22.90)	
Availability of Guidelines			
Yes	38(26.40)	26(18.10)	0.609
No	51(35.40)	29(20.10)	

DISCUSSION

Catheter-associated urinary tract infection (CAUTI) is one of the most common health care–acquired infections encountered in clinical practice. It can

be prevented by following proper measures like effective techniques of hand washing, meticulous care of the indwelling catheter and proper removal of the catheter. Unnecessary and the prolonged duration of catheterization should be avoided.[4] Nurses are the primarily responsible for urinary catheterization and its care. Hence nurses' knowledge has vital role in prevention of CAUTI. Our study aimed to find out the knowledge and practice on prevention of catheter associated urinary tract infection in selected teaching hospitals of Pokhara, Nepal. This study exhibited that out of total 144 nurses, majority 83(57.60%) nurses were below 25 years with a mean age of 24.93±3.9 years. This is similar to the study conducted in Nepal[8] and India.[12] With regard to educational level, this study comprised highest number of nurses with PCL nursing education 97 (67.40%). This was alike to the study done in Nepal and Pakistan.[7,13] Our study depicted that 66(45.80%) nurses had 1 to less than 3 years of work experiences. Similar findings were identified in the study conducted in Yemen with maximum nurses having experience of 1-5 years.[14] Current study showed 74.3% nurses had been exposed to patient with CAUTI which is in line with the findings of study done in Mangalaru, India in which majority of the staff nurses 81.7% have encountered the patients with CAUTI.[15] This similarity reflects the increased prevalence of CAUTI in clinical setting.

Surprisingly, our study identified that training regarding prevention of CAUTI was attended by only 32 (22.2%) nurses. Comparable data was found in the study conducted in Nepal and Ethopia where 56 (35%)[10] and 71 (38.6%)[16] of the study participants had previous information or training on prevention of CAUTI respectively. Study done in Yemen showed slightly more than half (51%) of nurses had training courses in the prevention of CAUTI.[14] This reflects there is a lack of in-service training and needed training on urinary catheter management which may have a significant impact on preventing CAUTI. In contrary to the above findings, the majority of nurses (91.2%) attended an educational or training program on urinary catheter procedures in a study conducted in Saudi Arabia.[17] Startlingly, the level of knowledge regarding prevention of CAUTI in our study portrayed that more than half (61.80%) nurses had poor and only (38.20%) nurses had good level of knowledge. These findings are in line with the outcomes of study conducted in Addis Ababa, Ethiopia which exhibited that nearly two-thirds (63.04%) of the study participants had poor level of knowledge, while merely (36.96%) had good level of knowledge towards prevention of CAUTIs.[16] The possible reason for the likeness in the findings could be the similarity between the study population, study setting (hospital). The outcome of poor knowledge might be due to the inadequacy of training or in service education and lack of proper guidelines to access and adhere to while caring the patients.

Likewise, the findings were low in a study conducted in Mangaluru India which revealed that majority of the nurses (80.85%) had average, (11.2%) had low and only (7.23%) had high knowledge regarding CAUTI.[15] However, in another study, the findings disclosed that majority (46.7%) had adequate knowledge, (33.3%) had moderately adequate knowledge, and (20%) had inadequate knowledge regarding catheter care.[19] With regard to the practice related to prevention of CAUTI, this study depicted that (66.00%) of nurses had good and (34.00%) of the nurses had poor practice. The findings of this study is supported by the study conducted in West Oromia, Ethiopia and Nepal where more than half (55%)[18] and (64.38%)[7] had good level of practice respectively. The result is also supported with a study conducted in Rwanda where a high percentage of nurses displayed a good application of different practices of CAUTI.[11] The resemblance in the outcomes might be due to the nurses' proficiency, intellectual skills in rendering care to the patients. Astonishingly, 95.8% had adequate practice towards the prevention of CAUTI in a study done in Chennai, India.[19] This inconsistency might be due to the differences in the tool used to rate the outcome, accessibility of infection prevention protocols and guidelines and availability and accessibility of supplies in their working units.

Our study accepts the findings of Nellore India and Ethiopia in which there was statistical significance between level of knowledge and continuing nursing education program (p-value=0.013) and training (p-value=0.035) respectively same as our study which identified significance between level of knowledge and training on prevention of CAUTI.[12,18] The possible justification could be that training enhances knowledge regarding prevention of CAUTI.

The findings of the current study depicted that there is statistically significant association between nurse's knowledge and their working unit (p-value=0.007) and training attended on prevention of CAUTI (p-value =0.000). This was inconsistent with the results of the study done in Mangaluru, India which showed association of level of knowledge with age (0.013), educational qualification (0.018), and encounter with patients having CAUTI.[15] Likewise, the findings of Nellore, India also showed that there is an association between the level of knowledge with educational qualification and source of information.[12]

Our study findings are different from the findings of the study conducted in Ethiopia where work-related experience is significantly associated with good knowledge.[18] The possible reason for the contradiction in result might be due to the fact that with increasing years of experience, healthcare providers are exposed to patients with CAUTI and become more experienced and informed. In the study done in Chitwan, Nepal and Saudi Arabia, there was a significant association between the nurses' level of knowledge and age.[7, 17] The similarity in the results of two different countries might be attributed to the fact that with increasing age there in increase in knowledge through exposure and learning. But this was not agreed by the findings of our study and the study conducted in Yemen where knowledge and age was not statistically significant.[14]

The findings of this study emphasize that health care authorities should increase the knowledge of nursing staffs through appropriate educational programs and training regarding the preventive measures of device-associated infections on how to avoid unnecessary urinary catheter use as this may help to decrease the length of catheter use and decrease the risk of urinary tract infection.

Since the study was confined to one particular teaching hospital of Pokhara with small sample size. So, the study findings could not be generalized in other settings. We recommended further study to be conducted in large sample size in different hospitals.

Limitations

This study was based on findings of Haemotoxylin and Eosin-stained sectiongeneralized.

CONCLUSIONS

The overall finding of the study concludes that even though only less than half of the nurses had good knowledge regarding catheter-associated urinary tract infections still the practice is good among more than half of the nurses. This study addresses a significant gap in theoretical knowledge and practice regarding prevention of Catheter-associated urinary tract infection. The present study shows that there is statistically significant association between nurse's level of knowledge and their working unit and training attended on prevention of CAUTI. While there were no significant association between nurse's level of knowledge and their age, educational level, work experience, exposure to patient with CAUTI and availability of guidelines for prevention of CAUTI in working place.

ACKNOWLEDGEMENTS

The researchers are thankful to Gandaki Medical College Teaching Hospital and Research Centre Pvt. Ltd. for the permission to conduct the study, the research participants for their valuable time and cooperation during data collection.

Conflict of interest: None

Funding: None

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Citation: Acharya A, Baral P, Parajuli A, Bhandari S, Koirala M. Nurses Knowledge and Practice on Prevention of Catheter Associated Urinary Tract Infection in Selected Teaching Hospital of Pokhara. JCMS Nepal. 2025; 21(4): 403-409.