

Study to Identify the Causes for Increase in the Incidence of CAUTI and to Implement Planned Teaching

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Abstract

Background: Urinary tract infection (UTI) is among the common bacterial infections worldwide and approximately 80% are associated with a urinary catheter. Catheter-associated UTI (CAUTI) has been associated with increased mortality, morbidity, length of hospital stay and the best way of CAUTI prevention is to adhere to recommended guidelines on infection control in the use of a urinary catheter. Complications associated with CAUTI cause discomfort to the patient, prolonged hospital stay, and increased cost and mortality.

Aim: The aim of this study is to assess the knowledge of nurses towards risk contributing to CAUTI and reduce the incidence of CAUTI.

Methods: An interventional study was performed to analyze the prevention of Catheter-associated Urinary tract infection. A prospective questionnaire was developed specially for this study. The questions regarding the indication for catheterization and measures for prevention of CAUTI were taken as per Centers for Disease Control (CDC) guidelines.

Results: The overall data for HAI was collected, out of which the incidences of CAUTI was high.

Conclusion: The conclusion of this study is, the CAUTI incidence is reduced through QCC (Quality Control Circle), providing a useful reference for the prevention of CAUTI and the development of medical quality improvement activities. There was a statistically significant gain in the knowledge of the nurses regarding the prevention of the CAUTI.

Keywords: UTI (Urinary Tract Infection); CAUTI (Catheter-associated Urinary Tract Infection).

Introduction

Catheter-associated urinary tract infections (CAUTI) have been described in the scientific literature as one of the most common device-associated healthcare-associated infections (DA-HAI) developed by patients hospitalized in the intensive care unit (ICU). CAUTI acquired by critically ill patients has been associated with

prolonged hospital length of stay (LOS), bacterial resistance, morbidity, and increased healthcare costs. Catheter associated urinary tract infections (CAUTIs) occur with high incidence if preventive protocols are not maintained.

The indwelling urinary catheter is an essential part of modern medical care and a variety of different indwelling urinary catheters are used

for various purposes. Catheter associated urinary tract infections constitute 40%-50% of all hospital infections. Due to these infections, there is increase in the hospital stay of the patient along with increase in the use of higher antibiotics.

The overall cost of health care also increases. Multiple risk factors can affect the occurrence of CAUTI. These include quality of aseptic technique, duration of catheterization, appropriate hand hygiene and care of catheter. The most common bacteria causing CAUTIs in hospitalized patients includes *E. coli*, *K. pneumoniae*, *P. aeruginosa*, *E. facialis*, and *Candida* species.

Methods

A test was conducted to check the knowledge on the prevention of CAUTI, in which 275 nurses took participation out of 305 nurses in the hospital. After the evaluation of the test the outcome was, 186 nurses were not able to clear the test.

For the nurses who were not able to clear the test, we conducted a teaching programme to implement the measures to prevent CAUTI and to help the nurses to improve in the aseptic procedure for insertion of catheters. After the teaching program, re-test was conducted for the nurses who did not clear the test.

In the re-test, most of the nurses had significant gain in the knowledge and were able to clear the test. After the test, the hospital staff nurses were asked to look into the prevention measures to reduce the incidences of the CAUTI.

Results

As per the hospital bundle checklist for CAUTI, a survey was carried out to check if the care factor were documented. The test revealed that among 275 nurses, 32.85% had a very good level of knowledge, 60.64% had a moderate level of knowledge on the prevention of the incidents of CAUTI.

Table 1: Comparison between pre-test and post-test mean scoring.

	Group	N	Mean scores	Std. Deviation	P Test
Total Score	Pre-test	275	11.68	1.704	0.001*
	Post-test	186	14.69	1.099	

Paired sample t test * Statistically significant

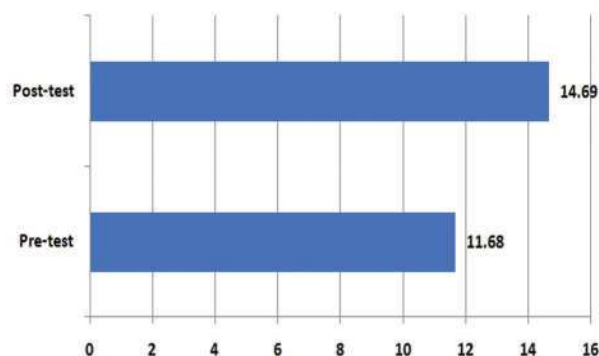


Fig. 1: The mean score at the pre-test was 11.68 ± 1.704 which changed into 14.69 ± 1.099 at post-test. The difference between pre-test and post-test was found to be statistically significant ($p=0.001$).

Comparison between the results of the knowledge assessment at pre-test with respect to qualification.

Table 2:

	Result		Total	P Value
	Frequency			
	Fail	Pass		
<i>Qualification</i>				
B.Sc. Nursing	112	44	156	0.045*
GNM	52	24	76	
M.Sc. Nursing	1	3	4	
PC B.Sc. Nursing	21	18	39	
Total	186	89	275	

Fisher exact test * Statistically significant

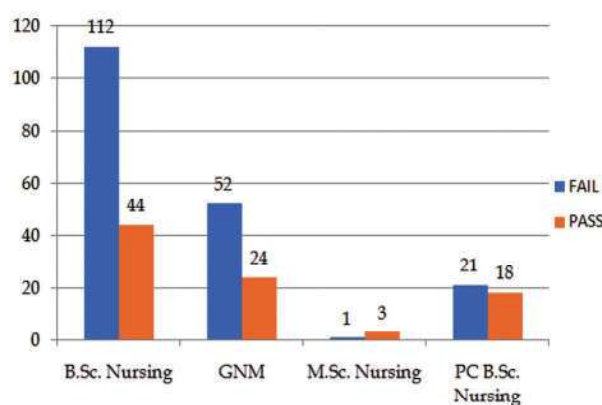


Fig. 2: There was a statistically significant difference between the knowledge assessment results with respect to the qualification at pre-test. ($p=0.045$).

Comparison between the results of the knowledge assessment at post-test with respect to qualification.

Table 3: There was no statistically significant difference between the knowledge assessment results with respect to the qualification at post-test. (p=0.106).

Qualification	Result Frequency		Total	P Value
	Fail	Pass		
B.Sc. Nursing	9	100	109	0.106
GNM	1	45	46	
M.Sc. Nursing	1	2	3	
PC B.Sc. Nursing	1	27	28	
Total	12	174	186	

Fisher exact test * Statistically significant

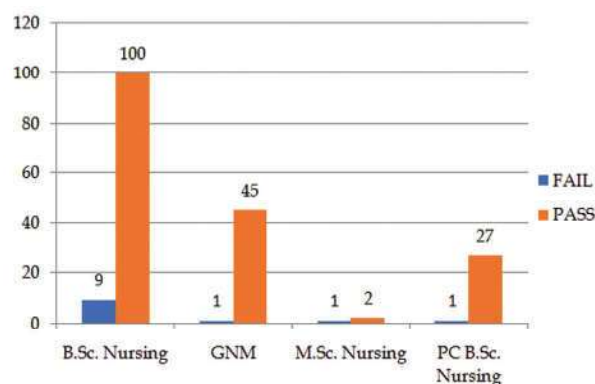


Fig. 3: There was no statistically significant difference between the knowledge assessment results with respect to the qualification at post-test. (p=0.106).

Comparison between the results of the knowledge assessment at pre-test with respect to years of experience

Table 4: There was a statistically significant difference between the knowledge assessment results with respect to the years of experience at pre-test. (p=0.001).

Year of experience	Result Frequency		Total	P Value
	Fail	Pass		
1-3 years	53	22	75	0.002*
3-5 years	30	6	36	
Less than 1 year	59	21	80	
More than 5 years	44	40	84	
Total	186	89	275	

Chi square test * Statistically significant

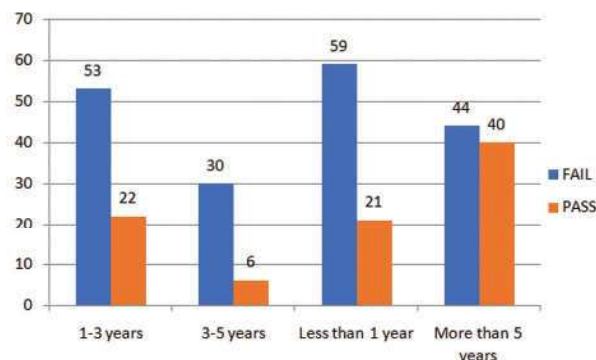


Fig. 4: There was a statistically significant difference between the knowledge assessment results with respect to the years of experience at pre-test. (p=0.001).

Comparison between the results of the knowledge assessment at post-test with respect to years of experience.

Table 5: There was no statistically significant difference between the knowledge assessment results with respect to the years of experience at post-test. (p=0.315).

Year of experience	Result-Frequency		Total	P Value
	Fail	Pass		
1-3 years	2	49	51	0.315
3-5 years	2	17	19	
Less than 1 year	2	57	59	
More than 5 years	6	51	57	
Total	12	174	186	

Fisher exact test * Statistically significant

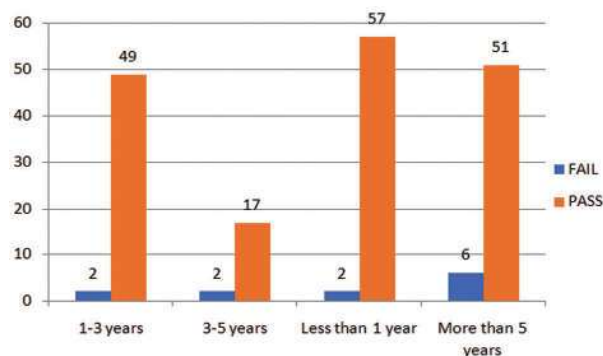


Fig. 5: There was no statistically significant difference between the knowledge assessment results with respect to the years of experience at post-test. (p=0.315).

Discussion

The aim of the study is to check the knowledge level of the nurses on the reduce the incidents of the CAUTI. The most important preventive measure for decreasing the incidence of CAUTI is limiting catheter use. The lack of knowledge

regarding various indications itself points toward increased catheter usage. To reduce the incidence of CAUTI can be achieved by frequent visits to the catheterized patients by the infection control team members at different timings. The major reason includes prolonged catheterization as a major risk factor for the development of CAUTI. A complete knowledge regarding all effective preventive measures would help them prioritize the care of the urinary catheters.

The incidence of CAUTI increases with a prolonged catheter retention time, hence limiting unnecessary catheterization and the timely removal of the catheter are the most effective measures to prevent CAUTI.

Conclusion

All the health care personnel including the doctors should have regular training regarding prevention of CAUTI. Infection prevention programs in every hospital must develop, implement, and monitor policies and procedures to minimize infections associated with the use of urinary catheters. The CAUTI incidence is reduced through QCC (Quality Control Circle), providing a useful reference for the prevention of CAUTI and the development of medical quality improvement activities.

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