



Effectiveness of Structured Teaching Programme on knowledge regarding prevention of Catheter Associated Urinary Tract Infection

Abstract:

Introduction: Catheter associated urinary tract infections (CAUTI) are the most common type of health care associated infections. Urinary catheter management has been evaluated to the best practice technique for providing effective catheter care and minimizing the catheter associated infections and complications. Nurses are generally responsible not only for catheter insertion but also for ongoing catheter management and removal, therefore nurses should receive continuing education regarding the current evidence-based practices for preventing CAUTI.

Objectives: The objectives of the study were to assess the knowledge regarding prevention of catheter associated urinary tract infection among staff nurses & effectiveness of structured teaching programme and association of knowledge level with selected demographic variables.

Methodology: The A pre-experimental study with one group pretest post test design was selected. A total of 56 staff nurses working in Intensive Care Unit were selected by using non-probability convenient sampling technique. Total 3 sessions was used for conducting structured teaching programme to collect data, first session was conducted for 17 night duty staff, second session for 19 evening duty staff and third session for 20 morning duty staff. The pretest and post test were done by using structured knowledge questionnaire on prevention of CAUTI for duration was 10-15 minutes followed by 45 minutes of structured teaching programme through lecture cum discussion using LCD projector. On 8th day of pretest, post test was done by using same structured knowledge questionnaire.

Results: The results of research study revealed that, mean knowledge score of subjects was 13.52 with standard deviation of 2.94 in pre test whereas in the post test mean knowledge score was 19.43 with standard deviation of 3.36. Calculated paired 't' value was found to be 12.41 (df = 55) with a p value < 0.001 hence, there is significant difference in pre-test and post-test knowledge. Study findings also showed that, there is no significant association between level of knowledge and age (P<0.98), gender (p=0.67), educational qualification (P=0.05), total professional experience (P=0.82), area of work (p=0.76) and attended any CNE programme (p=0.82).

Conclusion: Majority of staff nurses had moderate knowledge and study also found that structured teaching programme was effective in improving the knowledge regarding prevention of CAUTI among staff nurses working in intensive care unit.

Key Words: Knowledge, Prevention, Structure teaching programme, Catheter Associated Urinary

Amrita Bhattarai¹; Yogendra Prabhu²

¹ M.Sc. Nursing in Medical- Surgical Nursing, Ramaiah Institute of Nursing Education and Research, Bangalore.

² Associate Professor, Department of Medical-Surgical Nursing, Ramaiah Institute of Nursing Education and Research, Bangalore.

Corresponding Author:

Amrita Bhattarai

Email: amubhattarai@gmail.com

Introduction

Human body is made up of complex structures which work properly with the synchronized work of all systems.¹ Renal system is comprised of kidneys, ureter, bladder, and urethra. The kidneys balance urinary excretion of substances, ureters transport urine from the kidney to the bladder by peristaltic movement, bladder is a distensible chamber that stores urine, urethra is the exit passage way from the bladder and it carries urine for elimination from the body.²

Person is unable to pass urine from the body due to Acute or Chronic Urinary Retention, Benign Prostrate Hyperplasia, Urinary incontinence, Quadriplegia, Paraplegia, Neurogenic bladder, Coma, effect of various diagnostic surgical interventions involving the bladder and prostate. In these conditions catheterization is done.³ Catheterization is a process of draining urine from the bladder and mainly used for the purpose of diagnosis and relieving the symptom. A catheter which is inserted into the bladder and allowed to remain in the bladder for an extended period of time is called as indwelling catheter.³

As per National Healthcare Safety Network report UTIs are the most common type of healthcare-associated infections. Among UTIs acquired in the hospital, approximately 75% are associated with a urinary catheter, which is a tube inserted into the bladder through the urethra to drain urine. 15-25% of hospitalized patients receive urinary catheters during their hospital stay. The most important risk factor for developing a catheter-associated UTI (CAUTI) is prolonged use of the urinary catheter. The frequency of urinary catheterization in Intensive Care Unit can range as high as 100%.⁴

Once a catheter is placed, the daily incidence of bacteriuria is 3-10%. Between 10% and 30% of patients who undergo short-term catheterization (i.e. 2-4 days) develop bacteriuria and are asymptomatic. Between 90% and 100% of patients who undergo long-term catheterization develop bacteriuria. About 80% of nosocomial UTIs are related to urethral catheterization;

only 5-10% are related to genitourinary manipulation.⁵

Nurses are generally responsible not only for catheter insertion but also for ongoing catheter management and removal. Although nurses do not make the decision to insert a urinary catheter, they may have some influence on catheter use. It is critical, therefore that nurses receive continuing education regarding the current evidence-based practices for preventing CAUTI.⁶

The practices on infection control for the use of indwelling urethral catheters were classified in three parts: before, during and after catheter insertion. Before Catheter Insertion : Using a pair of sterile gloves for catheter insertion, opening and handling of indwelling catheter from its packaging, number of times using lubricant jelly, washing of hands before catheter insertion. During Catheter Insertion: cleaning the urethra with an antiseptic solution before inserting the catheter, maintaining an unobstructed urine flow for the indwelling catheter, amount of sterile water injected in the needleless port to inflate the balloon. After Catheter Insertion: Placement of urobag after insertion, ratio of collecting container used per patient in emptying the urobag, use of clean gloves when draining urine from urobag to collecting container, pulling out of catheter, proper sequence of things to do post-catheter insertion, wearing of gown when manipulating the indwelling catheter's collecting bag.⁷

Globally, 70-80% of these infections are attributable to use of an indwelling urethral catheter. As per All India Institute of Medical Science, in India almost 78% of total population was affected, and among these 68-78% used indwelling catheter as a part of treatment.⁴

A Study was conducted on occurrence of catheter associated urinary tract infection in critical care units in Maharashtra, India (2012) by taking consecutive urine samples of 345 catheterized patients revealed that 205 showed no growth and was found to be sterile. Bacterial growth in 69 patients and fungal growth in 50 patients. Study concluded that development of Catheter associated urinary tract infection is common in critically ill

patients and emphasis should be placed on good catheter management and reducing the duration of catheterization rather than prophylaxis in order to reduce the incidence of catheter related Urinary tract infection. Culture and susceptibility plays a vital role in the management if Urinary tract infection occurs.⁸

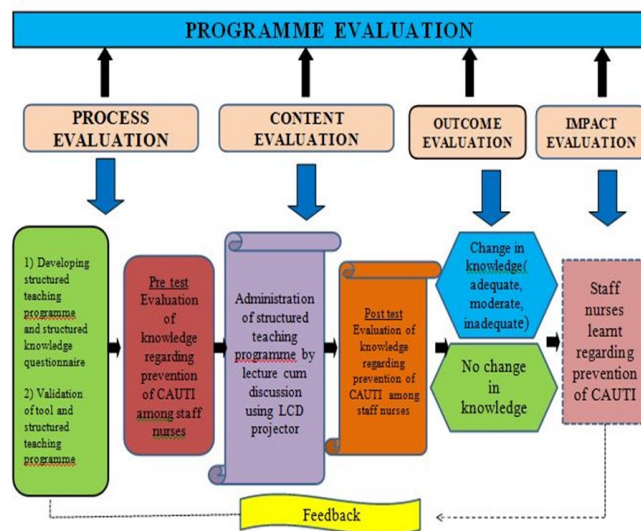
An experimental study was conducted to assess the effectiveness of planned teaching programme on knowledge of staff nurses regarding prevention of urinary tract infection among patients with indwelling catheter (2014). 90 staff nurses were selected by using simple random sampling techniques at Geetanjali Hospital. The tool comprised of structured self-administered questionnaire. The pretest was conducted and the planned teaching program was administered. The post test was conducted after one week. The data obtained were analyzed by using descriptive and inferential statistics. The mean score of post-test knowledge 21.53 (71.76%) was apparently higher than the mean score of pre-test knowledge 13.51 (45.03%), suggesting that the planned teaching programme was effective in increasing the knowledge. The mean difference 8.02 between pre-test and post-test knowledge score of the staff nurses was found to be significant. The study concluded that the planned teaching program was highly effective in the prevention of urinary tract infection.⁹

The apparent gaps in nursing knowledge of catheter care suggest the need for educational programs on catheter care practices. Hence, based on the above statistics and evidence, personal and professional experience of the student researcher working in medical and surgical wards felt the need to do study on effectiveness of structured teaching programme on prevention of catheter associated urinary tract infection among nurses working in selected hospitals.

Conceptual Framework

The conceptual framework used in this study was based on modified Roberta Straessele Abruzzese (RSA) evaluation model (1978). It consists of five levels of evaluation process in relation

to one another based on purpose, scope and resource component of evaluation which are process, content, outcome, impact and programme evaluation.



Methodology

This pre-experimental study was conducted in Bangalore, India among staff nurses working in Intensive Care Unit. A pre experimental one group pre-test and post-test design was selected therefore 56 staff nurses were selected based on eligibility criteria using non-probability convenient sampling technique. Evaluative approach was used to measure the effectiveness of structured teaching programme. The inclusion criteria were, staff nurses who are working in Intensive Care Unit, present at the time of data collection, willing to participate in the study. The exclusion criteria were working in paediatric units.

Schematic Representation research design:

Experimental group : O1 X O2

O1 - Observation 1 (pre-test) , X - Intervention, O2 - Observation 2(post-test)

The tool used for the study consisted of 2 parts. Section A consisted of socio-demographic variables and section B consisted of 26 questions which was structure knowledge questionnaire on prevention of CAUTI. The items were related to CAUTI, its incidence, causes and risk factors, classification, pathogens, various preventive measures as well as

Result

Statistical analysis for the study was done using IBM SPSS version 20.

Descriptive statistics: Frequency and Percentage distribution used to describe the socio-demographic data. Mean and standard deviation was used to assess the knowledge regarding prevention of CAUTI among staff nurses working in intensive care unit.

Inferential statistics: Chi-square was used to find association between knowledge and socio-demographic variables. Pair “t” test was used to assess the effectiveness of structured teaching programme on knowledge regarding prevention of CAUTI.

Table 1: Frequency and Percentage distribution of Pre-test and post-test level of knowledge regarding prevention of CAUTI n=56

Knowledge Level	Pretest		Posttest	
	f	%	f	%
INADEQUATE KNOWLEDGE (< 50%)	21	37.5	0	0
MODERATE KNOWLEDGE (50 – 75%)	35	62.5	24	42.9
ADEQUATE KNOWLEDGE (> 75%)	0	0	32	57.1
TOTAL	56	100	56	100

Table 1 shows that, during pre-test majority of subjects 62.5% had moderate knowledge and 37.5% had inadequate knowledge, whereas in post-test majority of subjects 57.1% had adequate knowledge and 42.9% had moderate knowledge.

Table 2: Effectiveness of STP on Knowledge regarding prevention of catheter associated urinary tract infection among staff nurses. n=56

	Mean	SD	t- value (df)	p- value
Pre- test	13.52	2.94	12.41 (55)	0.001*
Post- test	19.43	3.36		

***Significant**

Table 2 shows that, the calculated ‘t’ value (12.41) is greater than the table ‘t’ value (3.460) at $p < 0.001$, hence research hypothesis (H1) stated as there is significant difference in the level of knowledge among staff nurses before and after attending structured teaching programme on prevention of catheter associated urinary tract infection is accepted.

complications. Correct answers were awarded with one mark and wrong answers with zero. Thus, the item maximum score was 26 and minimum score was 0. To interpret the level of knowledge, the scores were Below <50%(13): Inadequate knowledge, 50-75% (13-20): Moderate knowledge, >75 (21-26) : Adequate knowledge.

Tool validation was done by 8 experts followed by pretesting it among 10 staff nurses. Reliability of the tool was obtained by using Split half technique with Spearman-Brown Prophecy formula for internal consistency, which was $r = 0.76$. Ethical clearance was obtained from Institutional Research Committee. Pilot study was conducted from 14/3/2017 to 21/3/2017 with formal permission from selected Hospital, Bangalore. The total samples were 10 staff nurses working in Intensive Care Unit were used for statistical analysis. Although pilot study revealed that majority of staff nurses were having inadequate knowledge regarding prevention of CAUTI. Hence structured teaching programme is effective in improving knowledge of staff nurses working in intensive care unit.

The main study was conducted at selected Hospital, Bangalore from 5/4/2017 to 12/4/2017. Data collection procedure was started after obtaining formal permission from the concerned authorities. Staff nurses were selected by using non probability convenient sampling technique. Investigator introduced herself, explained the purpose of the study and obtained an informed consent from them for participating in the research study. Total 3 sessions were used for conducting structured teaching programme to collect data, first session was conducted at 8:30 am for 17 night duty staff, second session at 12:30 pm for 19 evening duty staff and third session at 2:30 pm for 20 morning duty staff. The pretest was done by using structured knowledge questionnaire on prevention of CAUTI for duration was 10-15 minutes followed by 45 minutes of structured teaching programme through lecture cum discussion using LCD projector. On 8th day of pretest, post test was done by using same structured knowledge questionnaire.

Discussion

The findings of the study showed that 62.5 % have moderate level of knowledge and 37.5 % have inadequate level of knowledge regarding prevention of catheter associated urinary tract infection before structured teaching programme. This findings were supported by a study conducted by Mark Lister F. Opina on Infection Control in the Use of Urethral Catheters: Knowledge and Practices of Nurses in a Private Hospital in Iloilo (2014) among 30 staff nurses. The result revealed that 70 % of nurses had average level of knowledge whereas 30% has low level of knowledge regarding infection control in use of urethral catheter.⁶

The present study showed that mean knowledge score of subjects was 13.52 with standard deviation of 2.94 in pre test whereas in the post test mean knowledge score was 19.43 with standard deviation of 3.36.

The overall pre test and post test knowledge was found to be 't' = 12.41 (table value, 't' = 3.460) at $p < 0.001$. Hence, the research hypothesis stated H1: there is significant difference in the level of knowledge among staff nurses before and after attending structured teaching programme on prevention of catheter associated urinary tract infection was accepted. Study concluded that structured teaching programme is effective in improving the knowledge of staff nurses regarding prevention of catheter associated urinary tract infection.

A study findings supported by a study conducted by Vijay Purbia, Himanshu Vyas on, to assess the effectiveness of planned teaching programme on knowledge of staff nurses regarding prevention of urinary tract infection among patients with indwelling catheter at Rajasthan (2014). 90 staff nurses were selected by using simple random sampling techniques. The mean score of post-test knowledge 21.53 (71.76%) was apparently higher than the mean score of pre-test knowledge 13.51 (45.03%), ('t' value = 17.06, $p < 0.05$).⁹

The association between the pre-test knowledge scores and socio demographic variables of staff nurses working in intensive care unit were calculated by using χ^2 test at $p < 0.05$ significance level. The chi square analysis showed that computed chi square value was less than table value at $p < 0.05$. Hence research hypotheses H2 stated as there is significant association between level of knowledge and socio demographic variables was rejected.

A study findings supported by a study conducted by Christy Annie Zazhariah on, to assess the effectiveness of self instructional module on knowledge and practice among staff nurses regarding prevention of urinary tract infection in patients with indwelling catheter at Maharashtra(2015). Non probability purposive sampling technique was used to collect 30 samples. The structured teaching questionnaire was used to assess the knowledge of staff nurses regarding prevention of urinary tract infection in patients with indwelling catheter. There is no significant association between the knowledge with selected socio demographic variables like age, gender and years of experience as p value > 0.05 .¹⁰

Conclusion

The study concluded that structured teaching programme was effective in improving the knowledge of staff nurses regarding prevention of catheter associated urinary tract infection.

Recommendation

- This study can be replicated in different setting with larger sample.
- This study also can be replicated by including control group.
- A similar study can be conducted by using other educational methods like informational booklet, flash card etc.
- A similar study can be done to find out the attitude and practice of staff nurses regarding prevention of catheter associated urinary tract infection.

Acknowledgement

This I would like to express my sincere gratitude to the management, Gokula Education Foundation for providing me an opportunity to undertake the study in their esteemed Institution. I extend my whole hearted gratitude to Chief Administrator and Nursing Superintendent of selected Hospital, Bangalore for their approval to conduct the study. My hearty thanks to all the staff nurses who have willingly participated in the study. Lastly, I extend my special thanks to all my well-wishers and many others who have helped me directly and indirectly in the completion of the study.

Ethical Clearance

Ethical clearance was obtained from Institutional Research Committee prior to conduction of the study. A formal permission was obtained from the Chief Administrative Officer and Nursing Superintendent of selected Hospital, Bangalore. Researcher explained the purpose of the study to staff nurses and obtained an informed consent from them for participating in the research study. Anonymity, privacy and confidentiality of all staff nurses were maintained during the study.

Funding

The study was self funded and no external funding sources were used.

References

- W. Anne GA. Anatomy and Physiology in Health and Illness [Internet]. 12thed.churchillivingstone;2006.335354p. Availablefrom:https://evolve.elsevier.com/cs/product/9780702055713
- B.M Joyce H. J. Medical-Surgical Nursing: Clinical Management for PositiveOutcomes [Internet]. 7th ed. 766-776 p. Availablefrom: http://www.amazon.com/Medical-Surgical-Nursing-Clinical-Management-Positive/dp/0721602207
- wikipedia. Urinary catheterization [Internet]. 30 september. 2016. p. 1. Availablefrom: https://en.wikipedia.org/wiki/Urinary_catheterization
- Brusch JL. Catheter-Related Urinary Tract Infection. 2015; Available from:http://emedicine.medscape.com/article/2040035-overview
- Stokowski LA. Preventing Catheter-Associated Urinary Tract Infections [Internet].2016..57.Availablefrom:www.medscape.com/viewarticle/587464_5
- Opina MLF, Oducado RMF. Infection Control in the Use of Urethral Catheters :Knowledge and Practices of Nurses in a Private Hospital in Iloilo City. asia pacific J Educ arts Sci [Internet]. 2014;1(5):93–100. Available from: http://apjeas.apjmr.com/wp-content/uploads/2014/11/APJEAS-2014-1089b.pdf
- Prasanna K, Radhika M. Knowledge regarding Catheter care among StaffNurses.IntJApplRes[Internet].2015;1(8)1826.Availablefrom:http://www.allresearchjournal.com/archives/2015/vol1issue8/PartD/1-7-157.pdf
- Chanda R Vyawahare, Nageswari R Gandham, Rabindra Nath Misra, Savita VJadhav, Neetu S Gupta KMA. Occurrence of catheter-associated urinarytractinfectioninriticalcareunits.2015;8(5)5859.Availablefrom:http://www.mjdrdypu.org/article.asp?is=09752870year=2015volume=8issue=5;spage=585;epage=569
- Purbia V, Vyas H, Sharma MK, Rathore D. A study to assess the effectiveness of planned teaching programme on knowledge of staff nurses regarding. Int J Sci Res Publ [Internet]. 2014;4(1):1–5. Available from: http://www.ijsrp.org/research-paper-0114/ijsrp-p2538.pdf
- Zachariah A, Christy. Effectiveness of SIM on Knowledge & Practice among Nurses Regarding Prevention of UTI in Patients with Indwelling Catheter.2015.Availablefrom:https://www.ijsr.net/archive/v5i8/ART20161022.pdf.