

A Study to Assess the Effectiveness of Structured Teaching Programme (STP) on Knowledge and Practice Regarding Indwelling Catheter Associated Urinary Tract Infection Among the Staff Nurses at J.K. Hospital And Research Center, Bhopal (M.P.)

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Abstract

Catheter-associated urinary tract infections (CAUTIs) are found to be more common type of nosocomial infection that represents major health concern due to its frequent recurrence and complexity associated with it. Method: Preexperimental research strategy using the one group pre-test, post-test design was adopted for the present study. In this one group pre-test and post-test design only one group was observed before and after the manipulation or intervention. Results: The result indicate that pretest mean knowledge score of staff nurses on regarding indwelling catheter associated urinary tract infection 9.93 and posttest mean knowledge score was 22.03. The demographic variables age, education. Total year of clinical of experience, attained any in-service education, type of institute from which studied and indwelling catheterization perform daily were associated with knowledge score. Pretest mean practice score of Staff Nurses regarding indwelling catheter associated urinary tract infection was 14.5 and posttest mean practice score was 36.13. The demographic variables like education, total year of clinical of experience, catheterization performed daily were associated with practice. Conclusion: It indicates that the staff nurses knowledge on CAUTIs was not adequate however the practice was there and both improved through STP.

Keywords: catheter, indwelling catheterization, urinary tract infections

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INTRODUCTION

Healthcare-associated infections are infections acquired during the course of receiving treatment for other conditions within a healthcare setting. Healthcare-associated infections are one of the top 10 leading causes of death in the world, according to the Centers for Disease Control and Prevention, which estimates that 1.7 million infections annually were reported among patients.^[1]

It has long been known that catheter associated urinary tract infection is the

most frequent type of infection in acute care settings. In a national estimate, urinary tract infections comprised 36% of the total health care-associated infections. Urinary tract infections are one of the most common culprits of nosocomial infections. Each year, urinary catheters are inserted into more than 5 million patients in acute-care hospitals and extended-care facilities and Catheter-associated urinary tract infection (CAUTI) is the affecting an estimated 600,000 patients per year.^[2]

In a report by Saint^[3] on urinary tract infections related to the use of urinary catheters, it was mentioned that 26% of patients that have indwelling catheters for 2–10 days will develop bacteriuria. Subsequently, 24% of those having bacteriuria will develop a CAUTI. Of these patients, nearly 3% will develop bacteremia.^[3]

The 1997 Association for Professionals in Infection Control and Epidemiology Position paper on urinary tract infections identifies CAUTI as the most typical infection among long-term care residents, with bacteriuria prevalence without indwelling catheters ranging as 25–50% in women and 15–40% in men. Therefore, usage of indwelling urinary catheters in residents of long-term care facilities can be expected to result in higher CAUTI rates with an associated risk of CAUTI-related bacteremia, unless suitable prevention efforts are undertaken.^[4]

In an effort to reduce the incidence of CAUTI, the infection preventionist plays certain roles that include: policy and best practice subject matter expertise, provision of surveillance data and risk estimate, consultation on infection prevention interventions, facilitation of CAUTI-related development plans. It is crucial that the infection preventionist communicates with all members of the patient care team. Providing subject matter expertise to those involved with clinical management of patients/residents, including physicians, physician assistants and nurse practitioners is vital. An understanding of the elements of surveillance definitions, compared to primary/secondary diagnoses and complications is required for suitable documentation and coding.^[5]

The following factors predispose UTI in patients with bladder indwelling urinary catheters inadequate hand-washing; urinary catheter insertion without the proper technique and antisepsis; bladder

tube separated from the urine bag; urine bag outlet touching the contaminated surface; urine from the bladder catheter or from the urine bag reentering the bladder; repeated bladder tube flushing; injudicious usage of the bladder catheter without appropriate indication; catheter indwelling more than the patient's need; catheter size above the patient's need that may damage the tissue and favor colonization; using cuffs of size greater than required increases the amount of residual urine, thereby enhancing the risk of infection. Catheters with cuffs > 10 ml must be used only under specific indications as the cases of specific procedures, or in women with pelvic muscle rupture.^[6]

Immediate patient/resident care personnel are responsible for insertion, care and maintenance of indwelling catheters. For success of the prevention project these personnel should be fully involved and devoted to patient safety initiative. Obtaining the resources that will engage direct care providers in CAUTI quality/performance development activities is a critical component of intervention program. Key players must be held responsible for compliance with the intervention. This can be facilitated through monitoring and reporting of the results of the intervention on a consistent basis and instituting additional improvements when appropriate.^[7]

Having in mind that these factors predispose patients to infections in hospital, nurses play the role of adopting measures to reduce the incidence of these infections, especially urinary tract infections (UTI) associated with bladder catheterization, since it is a task predominantly performed by nurses.

Within the context of multidisciplinary, it is necessary for the nurse to play a crucial role in the prevention and treatment of hospital infections, by means of team

training, continuing education and better interaction and communication with the medical team and the Nosocomial Infection Control Committee of the institution.

Nursing team training is based on enabling licensed practical nurses and technicians to perform bladder catheterization in an aseptic way, educating them as to hand washing, knowing that these are the major culprits for crossed infections and UTI, pointing to the need for proper antisepsis when caring for patients. Together with the medical team, nurses must discuss the criteria for bladder catheterization, its need and how long the catheter will remain in place, keeping in mind that the longer the catheter stays; more is the likelihood of the patient developing UTI. In this context, emphasis should be given on the management role that nurses play and the benefits their efficient work bring to patients and the institution. This is clear as policies are set in hospitals to prevent nosocomial infections, since prevention still is the best way to reduce ICU cost and consequently, morbidity and mortality related to UTI. Based on the results, it was shown that the risk of infection reduces after standardization of antiseptic techniques for bladder catheter insertion and maintenance.

REVIEW OF LITERATURE:

Kaufman et al. 2006^[8] conducted a study on condom versus indwelling urinary catheters a randomized trial. The objective of the study was to compare condom and indwelling urinary catheters in context to infection risk and patient satisfaction. The design was a prospective, randomized, unblinded, controlled trial. Participants that were hospitalized included men aged 40 and above who required a urinary collection device. Results: seventy-five subjects were randomized: 41 reception an indwelling catheter and 34 a condom

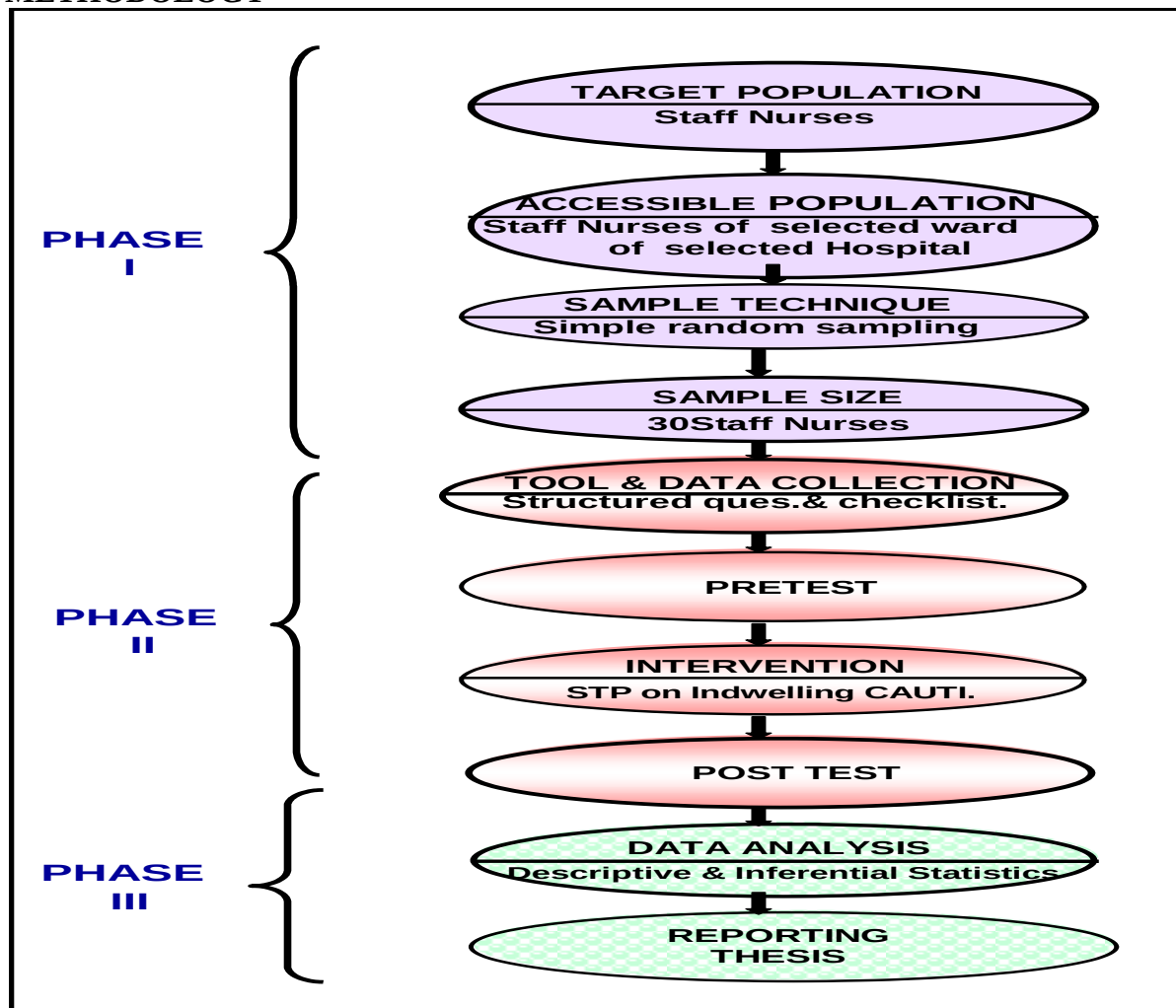
catheter. The incidence of an adverse result was 131/1,000 patient-days with an indwelling catheter and 70/1,000 patient-days with a condom catheter ($p=.07$). The median time to an adverse event was 7 and 11 days in the indwelling group and condom group respectively. After adjusting for other risk factors, it was observed that condom catheter use reduced adverse outcomes ($p=.04$). Patients without dementia who had an indwelling catheter were nearly 5 times as likely to develop bacteriuria or symptomatic UTI or to die (hazard ratio=4.84, 95% confidence interval=1.46-16.02) as those with a condom catheter ($p=.01$). Patients described that condom catheters were more comfortable ($p=.02$) and less painful ($p=.02$) than indwelling catheters. The conclusion of his study was that the use of condom catheters is less likely to cause bacteriuria, symptomatic urinary tract infection, or death than the use of indwelling catheters. This protection is especially apparent in men.

Brosnahan et al. 2004^[9] conducted a study on Types of urethral catheters for management of small-term voiding problems in hospitalized adults. The aim was to evaluate the effect of type of indwelling urethral catheter on the risk of urinary tract infection in adults who underwent small-term urinary catheterization. The results indicate that the use of silver alloy indwelling catheters for catheterizing hospitalized adults small-term reduces the risk of catheter acquired urinary tract infection. Further, economic evaluation is necessary to confirm that the reduction of infection compensates for the raised cost of silver alloy catheters. Catheters coated with a combination of minocycline and rifampin may also be useful in reducing bacteriuria in hospitalized men catheterized less than a week but this requires further testing. There was not sufficient evidence to

suggest whether or not any standard catheter was better than another in terms of reducing the risk of urinary tract infection in hospitalized adults catheterized small-term. Silicones catheters may be less likely

to cause urethral side effects in men: thus, this result should be interpreted with some caution as the trials were small and the outcome definitions and specific catheters compared varied.^[10]

METHODOLOGY



Schematic Representation of Research Design

OBJECTIVES

- (1) Assess the knowledge of staff nurses regarding indwelling catheter associated urinary tract infection.
- (2) Assess the practice of staff nurses regarding indwelling catheter associated urinary tract infection.
- (3) Find out the association between pretest knowledge scores & selected demographic variables.
- (4) Find out the association between pretest Practice scores & selected demographic variables.

- (5) Find out the effectiveness of structured teaching on knowledge & practice of staff nurses.

ANALYSIS & INTERPRETATION

Pretest Knowledge Scores Regarding Indwelling Catheter Associated Urinary Tract Infection among Staff Nurses

Knowledge level of the staff nurses regarding indwelling catheter associated urinary tract infection was assessed on the basis of broad knowledge area of indwelling catheter, catheter care and

maintenance and indwelling catheter associated urinary tract infections. Tables 1 and 2 shows the classification of knowledge of staff nurses, according to grading based on the marks scored by them in a test conducted before administering STP (pre-test).^[11-23]

Data in Table 1 depicts that 2 (6.66%) of the respondents scored very poor grade and 28 (93.33%) scored poor grade. The mean score was 9.93 and SD was 1.68 (Figure 1-3).^[25-39]

Table 1. Classification of Pre-Test Knowledge Score of Staff Nurse According To Grading, Maximum Score-30.

Knowledge scores	Grade	Frequency	Percentage (%)	Mean score	SD
0-6(0-20%)	Very poor	2	6.66	9.93	1.68
7-12(20-40%)	poor	28	93.33		
13-18(40-60%)	average	0	0		
19-24(60-80%)	good	0	0		
24-30(80-100%)	Very good	0	0		

Table 2. Area Wise Distribution of Pre Test Knowledge Scores of Staff Nurses Regarding Indwelling Catheter Associated Urinary Tract Infection.

Sl. No	Knowledge	Mean	Standard deviation	Mean percentage (%)
1	Indwelling catheter	0.96	0.408	16
2	Care and maintenance	4.26	0.49	42.6
3	Indwelling CAUTIs	4.7	0.802	33.57

The pretest knowledge scores, in various knowledge area are presented in Table 2. Mean, mean% and SD scores in different areas shows that the response was poor and the mean knowledge score is less in the area of indwelling catheter, catheter care and maintenance, indwelling catheter

associated urinary tract infection exercises. From the above standard deviation it is known that the nurses in group can be considered as homogenous group, with respect to knowledge level regarding indwelling catheter associated urinary tract infection.^[40-50]

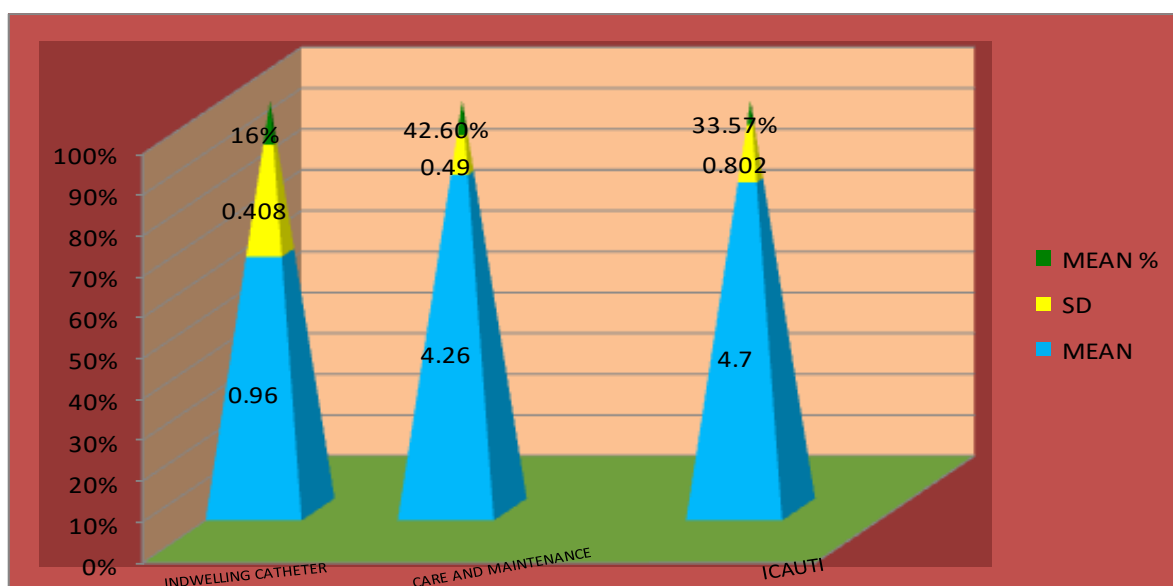


Fig. 1. Showing Area Wise Mean, SD and Mean % Distribution of the Pretest Knowledge Score.

Pre-test Practice Scores Regarding Indwelling Catheter Associated Urinary Tract Infection among Staff Nurses

Practice of the staff nurses regarding indwelling catheter associated urinary tract infection was assessed on the basis of broad practice area of pre preparatory phase, preparatory phase, performance

phase, after care, catheter care and maintenance indwelling catheter associated urinary tract infections. Tables 3 and 4 shows the classification of practice of staff nurses, according to grading based on the marks scored by them in a check list before administering STP (pre-test).

Table 3. Classification of Pretest Practice Score of Staff Nurses Regarding Indwelling Catheter Associated Urinary Tract Infection According to Grade

Knowledge scores	Grade	Frequency	Percentage (%)	Mean score	SD
0–9(0–20%)	Very poor	0	0	14.5	2.147
10–18(20–40%)	poor	28	93.33		
19–27(40–60%)	average	2	6.66		
27–36(60–80%)	good	0	0		
37–45(80–100%)	Very good	0	0		

Maximum Score-45

Data in Table 3 depicts that 28 (93.33%) of the respondents scored poor grade and 2

(6.66%) scored average grade. The mean score was 14.5 and SD was 2.147.

Table 4. Area Wise Distribution of Pretest Practice Scores of Staff Nurses Regarding Indwelling Catheter Associated Urinary Tract Infection

Sl. No	Knowledge	Mean	Standard deviation	Mean percentage (%)
1	Pre preparatory phase	3.33	0.534	47.57
2	Preparatory phase	4.933	0.783	49.33
3	Performance phase	4.16	0.904	29.71
4	After care	3.066	1.004	51.1
5	Catheter care and maintenance	0.966	0.998	13.8

The pretest practice scores, in various practice area are presented in Table 4. Mean, SD and mean% scores in different areas shows that the mean practice score is less in the area of prep reparatory phase, preparatory phase, performance phase after care and catheter care and maintenance.

From the above standard deviation it is known that the nurses in group can be considered as homogenous group, with respect to practice level regarding indwelling catheter associated urinary tract infection (Tables 5, 6).

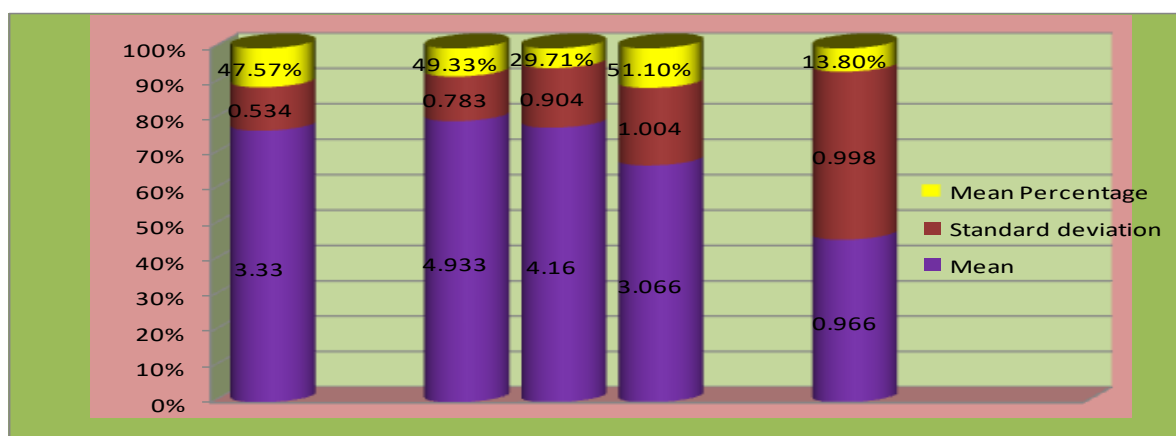


Fig. 2. Figure Showing Area Wise Distribution of the Pretest Practice Score.

Effectiveness of Structured Teaching Programme Regarding Indwelling Catheter Associated Urinary Tract Infection on Knowledge Score Among Staff Nurses

The data in Table 6 that mean posttest knowledge score (22.03) was apparently higher than the pretest knowledge score

(9.93). The mean difference (12.1), SD(1.858) and computed “t” value (26.47) at the level of <0.005 showed that highly significant difference between the pretest and posttest knowledge scores. This indicated that the STP for indwelling catheterization in children was effective in gain in knowledge of staff nurses.

Table 5. Mean, Mean Difference, Standard Deviation (SD) and “t” Value of Pre- and Post-test Knowledge Scores on Indwelling Catheter Associated Urinary Tract Infection.

Knowledge area	Mean score	Mean difference	SD	df	“t” value	Table value
Pretest	9.93	12.1	1.858	29	26.47	2.05
Posttest	22.03				Significant	

Maximum score = 26, At the Level of 0.05.

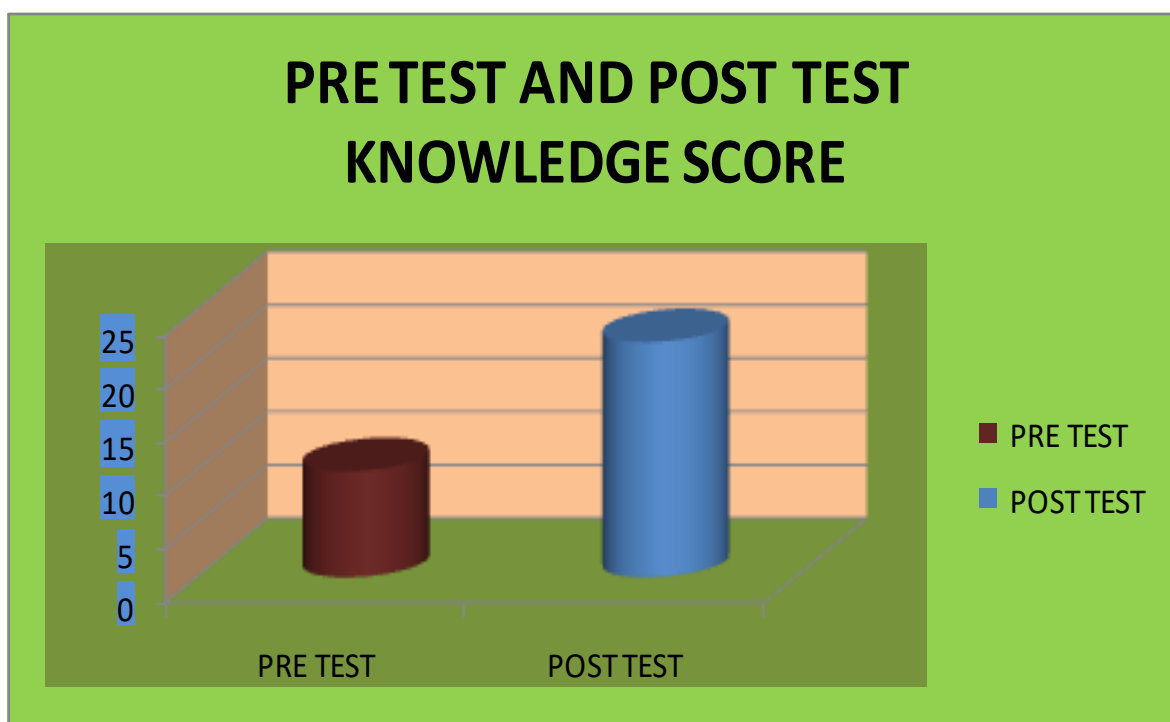


Fig. 3. Distribution of Pre- and Posttest Knowledge Score.

Effectiveness of Structured Teaching Programme Regarding Indwelling Catheter Associated Urinary Tract Infection on Practice Score Among Staff Nurses

The data in Table 6 depicted that mean posttest practice score (36.13) was apparently higher than the pretest practice score (14.5). The mean difference (21.63),

SD(1.64) and computed “t” value (44.54) at the level of 0.05 showed that there was high significant difference between the pretest and posttest practice scores. This indicated that the STP for indwelling catheter associated urinary tract infection was effective in gain in practices of Staff Nurses (Figure 4).

Table 6. Mean, Mean Difference, Standard Deviation (SD) and “t” Value of Pre- and Posttest Practice Scores of Staff Nurses on Indwelling Catheter Associated Urinary Tract Infection.

Practice area	Mean score	Mean difference	SD	df	‘t’ value	Table value
Pretest	14.5	21.63	1.64	29	44.541 Significant	2.05
Posttest	36.13					

Maximum Score = 39, $P < 0.05$.

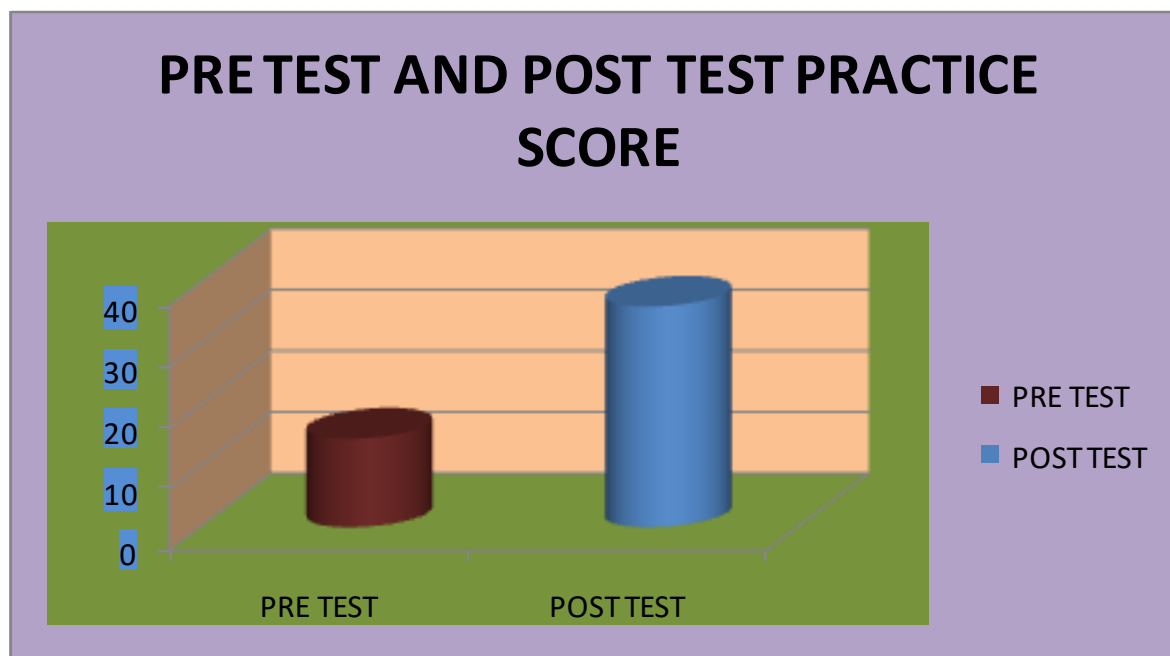


Fig. 4. Distribution of Pre- and Posttest Practice Score.

To find out association between pretest knowledge scores regarding indwelling catheter associated urinary tract infection among staff nurses and selected demographic variables among staff nurses that the computed Chi-squares values between the pretest knowledge scores and the demographic variables age, education., total year of clinical of experience, attained any in-service education, type of institute from which studied and indwelling catheterization perform daily were associated and with sex not associated.

To find out association between pretest practice scores regarding indwelling catheter associated urinary tract infection among staff nurses and selected demographic variables among staff nurses. The computed Chi-squares values between the pretest practice scores and the

demographic variables like education., total year of clinical of experience, catheterization perform daily were associated and attained any in-service education, age and sex were not associated.^[50–59]

CONCLUSION

The main aim of this evaluatory study was to assess the knowledge and practices of Staff Nurses regarding indwelling catheter associated urinary tract infection. 30 Staff Nurses were selected by purposive sampling technique. A structured teaching programme was implemented, which included definition, incidence, risk factors, etiology, patient pathway of urinary tract infection diagnostic evaluation treatment, guideline for preventing catheter associated urinary tract infection. This helped the Staff Nurses to gain more knowledge and improve their practices

regarding Indwelling catheter associated urinary tract infection.

The structured teaching programme on indwelling catheter associated urinary tract infection helped to update their knowledge and to improve their practices, which was evident, in the post test knowledge and practice scores.

RECOMMENDATIONS

From the findings of the present study, the following recommendations had been suggested.

A similar study can be conducted on a much larger sample for broader generalization.

- (1) The study may be replicated in different settings.
- (2) An experimental study could be undertaken with a control group.
- (3) * A follow up could be carried out to find out the effectiveness in terms of retention of knowledge practices. A comparative study can be done between the government and private institutions regarding efficacy and compliance of the standard protocols or guidelines.

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