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EFFECT OF VIDEO ASSISTED TEACHING MODULE (VATM) ON PREVENTION OF CATHETER ASSOCIATED URINARY-TRACT INFECTION (CAUTI) AMONG STAFF NURSES WORKING IN SELECTED TERTIARY CARE HOSPITALS, MAHARASHTRA.

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Abstract: Urinary tract infection remains one of the most common healthcare-associated infections in the intensivecare unit and predominantly occurs in patients with indwelling urinary catheters. Duration of catheterization is the most important risk factor for developing CAUTI. General strategies for preventing CAUTI include measures such as adherence to hand hygiene. Targeted strategies for preventing CAUTI include limiting the use and duration of urinary catheters, using aseptic technique for catheter insertion, and adhering to proper catheter care [4]. ***Objectives:*** 1. To assess the knowledge of staff nurses on prevention of CAUTI in experimental and control groupbefore intervention. 2. To assess the knowledge of staff nurses on prevention of CAUTI in experimental and control group afterintervention. 3. To find out the association between post-test knowledge scores and demographic variables of staff nurses in experimental group ***Methodology:*** Quantitative Quasi experimental with non-randomized control group design was selected to conduct study. 160 staff nurses were selected as samples based on exclusion and inclusion criteria through non- probability convenient sampling techniques. **Results:** The comparison of pretest and post test knowledge scores of staff nurses regarding CAUTI. Mean, standard deviation and mean difference values are compared and student's paired 't' test is applied at 5% level of significance. The tabulated value for n=80-1 i.e. 79 degrees of freedom was 1.98. The calculated 't' value i.e. 3.59 are much higher than the tabulated value at 5% level of significance for overall knowledge score of staff nurses which is statistically acceptable level of significance. Hence it is statistically interpreted that the Video Assisted Teaching Module on knowledge regarding CAUTI among staff nurses was effective. Thus the H_1 is accepted. Conclusion: Video Assisted Teaching Module was effective in increasing the knowledge of staff nurses regarding prevention of CAUTI.

Index Terms **– CAUTI, Staff Nurses, Video Assisted Teaching Module**

I. Introduction

Urinary tract infection remains one of the most common healthcare-associated infections in the intensive care unit and predominantly occurs in patients with indwelling urinary catheters. Duration of catheterization is the most important risk factor for developing CAUTI. General strategies for preventing CAUTI include measures such as adherence to hand hygiene. Targeted strategies for preventing CAUTI include limiting the use and duration of urinary catheters, using aseptic technique for catheter insertion, and adhering to proper catheter care [4].

A. Background

Health-care associated infections are contracted because of an infection or toxin that exists in a certain location, such as a hospital. They occur when a person develops an infection while providing health careservices. These infections are associated with significant morbidity, mortality, and hospital even costs [1]. One such hospital acquired infection is UTI. Urinary tract infection attributed to the use of an indwellingurinary catheter is one of the most common infections acquired by patients in health care facilities [2]. CAUTI is an important device-associated health care acquired infection. The use of an indwelling urethralcatheter is associated with an increased frequency of symptomatic urinary tract infection and bacteremia, and additional morbidity from non-infectious complications [1].

B. Need of the study

A UTI is an infection involving any part of the urinary system, including urethra, bladder, ureters, and kidney. UTIs are the most common type of healthcare-associated infection reported to the National Healthcare Safety Network (NHSN). 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. Between 15-25% of hospitalized patients receive urinary catheters during their hospital stay. The most important risk factor for developing a catheter-associated UTI is prolonged use of the urinary catheter. Therefore, catheters should only be used for appropriate indications and should be removed as soon as they are no longer needed [3].

C. Title of the study

Effect of Video Assisted Teaching Module (VATM) on prevention of catheter associated urinary-tract infection (CAUTI) among Staff nurses working in selected Tertiary Care Hospitals, Maharashtra.

D. Objectives of the study

1. *Primary Objective:* The primary objective was used to find out the effect of VATM on prevention of CAUTI among staff nursesworking in selected tertiary care hospitals, Maharashtra.

2. *Secondary Objectives:*

- To assess the knowledge of staff nurses on prevention of CAUTI in experimental and control groupbeforeintervention
- To assess the knowledge of staff nurses on prevention of CAUTI in experimental and control group afterintervention
- To find out the association between post-test knowledge scores and demographic variables of staff nursesin experimental group

E. Operational definitions

1. *Assess* – Refers to statistical measures of prevention of CAUTI by using VATM among staff nurses working intertiary care hospital.
2. *Effect* – it was operationalized as a statistical difference (as a result of VATM) in pre-test and post-test knowledge scores of staff nurses in experimental and control group as measured by SAQ on prevention of catheter associated urinary-tract infection (CAUTI).
3. *Video assisted teaching module* – refers to a teaching aid that contains systematically organized seriesof video content prevention of CAUTI that was used to teach staff nurses in experimental group. The contain of VATM definition of CAUTI, Causes and risk factor, clinical manifestation and preventive management of CAUTI.
4. *Prevention of CAUTI* – refer to the primary health care measures of staff nurses to prevention catheter associated urinary tract infection in the tertiary care hospital.
5. *Tertiary care hospitals* – refer to three selected health care agencies (study setting) with specialized health care branches located, Maharashtra from where the samples have drawn for research study.
6. *Staff nurses* – refers to the employees registered as RNRM of both genders with diploma & degree qualification in nursing working at selected tertiary care hospitals, Maharashtra from where the samples aredrawn for research study.

F. Hypothesis

H1: There is a significant difference between pre-test and post-test knowledge scores on prevention of CAUTI among staff nurses in experimental and control group.

H2: There is a significant difference between post-test knowledge scores of staff nurses in experimental and control group on prevention of CAUTI

H3: There is a significant association between post-test knowledge scores on prevention of CAUTI and demographic variables of staff nurses.

G. Delimitation

The study was limited to -

- assessment of knowledge
- 160 samples
- tertiary care hospitals

H. Ethical Aspects

The study proposal was accepted by the ethical committee of the institution. Permission was obtained by the concerned authorities before conducting the study. Consent letter was obtained by individual samples after explaining them the research process in their own language. Confidentiality regarding the participants information was maintained by using code number by the investigator.

I. Review of literature

In the present study the literature reviewed has been organized into the following categories:

- Literature related to causes and risk factor of CAUTI
- Literature related to preventive management of catheter associated urinary tract infection
- Literature related to knowledge of staff nurses regarding prevention of catheter associated urinary tract infection
- Literature related to effect of VATM as a method of teaching

J. Conceptual Framework

Conceptual framework for the study was based on The Ludwig Von Bertalanffy (1968) system model.

II. Material and method

A. Research approach: Quantitative research approach

B. Research design: Quasi-experiment with non-randomized control group design

C. Research setting: Selected three selected hospital

D. Variables

1. Independent variable: The VATM on prevention of CAUTI was independent variable of research study.
2. Dependent variable**:** In the present study, the knowledge on prevention of CAUTI was dependent variableof theresearch study.
3. Extraneous Variables: Demographic variables such as age, gender, religion, qualification, professional experience and monthly income of staff nurses were the extraneous variables.

E. Population:

1. Target population**:** Staff Nurses to whom study findings are generalized were considered as target population.
2. Accessible population**:** Staff Nurses who were available for research studies were considered as accessiblepopulation.

F. Sampling

1) Sample size: 160 staff nurses

2) Sampling technique: Non probability convenient sampling technique.

G. Sampling criteria

Inclusion criteria

- Staff nurses those who were consented to participate in the study
- Staff nurses those who were available at the time of data collection
- Staff nurses those who are registered in the state nursing councilExclusion criteria
- Registered nurses with the designation of Nursing superintendent grade I and grade II

H. Description of Tools

1) Section A: Demographic variables

2) Section B: Self-structured questionnaire based on prevention of CAUTI

I. Validity

Content validity of SAQ and VATM were established in consultation with 8 experts from the field of Medical Surgical Nursing (n=6), nursing superintendent (n=1), statistician (n=1). The suggestions of subject experts were taken into consideration and reframed the same.

J. Reliability

Data was collected from 16 staff nurses who were working in selected hospital (other thanthe main study area) to test reliability of SAQ. The split half method was used where the tool was divided into two parts; then both parts given to one group of staff nurses at same time. The score from both parts is correlated. Karl Pearson's correlation coefficient was calculated and SAQ was found to be reliable (r = 0.93). hence, the SAQ was considered reliable.

K. Pilot study

Prior to intervention, the SAQ was used to assess the knowledge of staff nurses on prevention of CAUTI in control and experimental group. Immediately after pre-test, the VATM on prevention of CAUTI is used to teach staff nurses belonged to experimental group. after one week of intervention, the post-test was conducted among both the groups using same tool used for the pre-test. Collected data was coded, tabulated and analyzed using descriptive and inferential statistics.

L. Data collection

- *The main study data was gathered from 04/07/2022 to 16/07/2022.*
- *The samples were approached in small groups on a daily basis.*
- *Before giving the questionnaire, self-introduction was given by the investigator and the purpose of thestudy mentioned.*
- *Consent of the samples were taken.*
- *The pre-test questionnaires were distributed and collected back after 30 minutes.*
- *After collecting the Pre-test score, the investigator administered the treatment (VATM on prevention of catheter associatedurinary tract infection).*
- *After 7 days post-test was taken on the same subjects.*

V. Result

Section I: Distribution of Staff nurses according to their demographic variablesin experimental group and control group

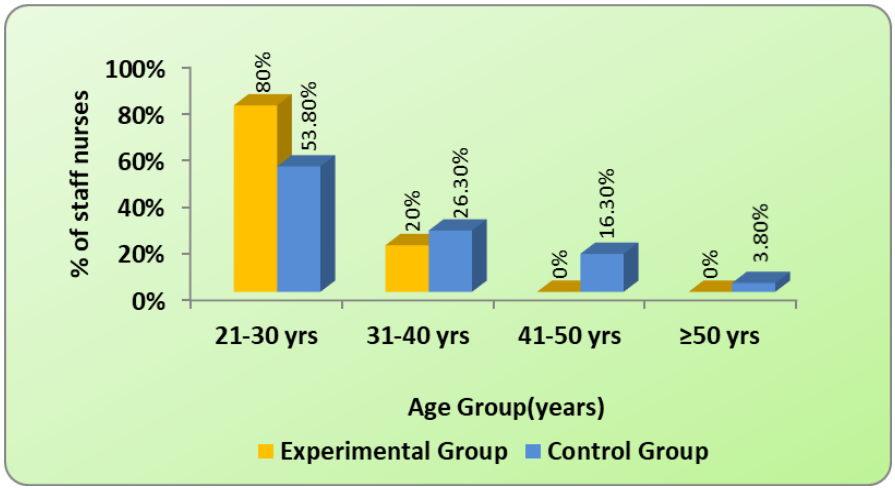

Figure 4.1.1: Percentage distribution of staff nurses according to their age in experimental& control group.

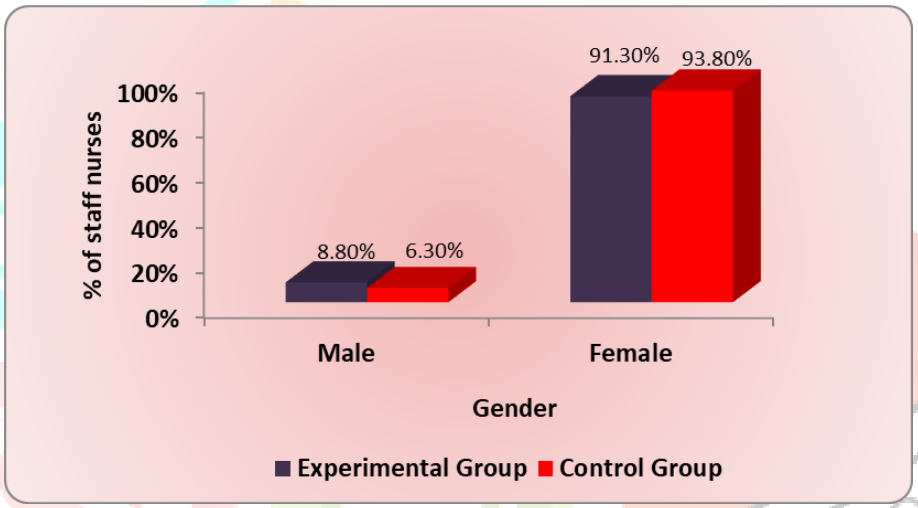

Figure 4.1.2: Percentage distribution of staff nurses according to their gender in experimental & control group.

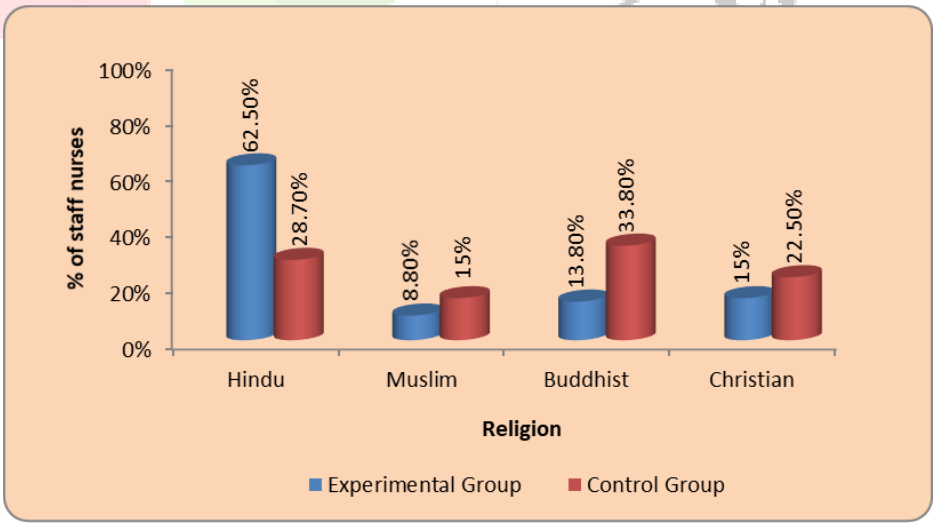

Figure 4.1.3: Percentage distribution of staff nurses according to their religion inexperimental & control group.

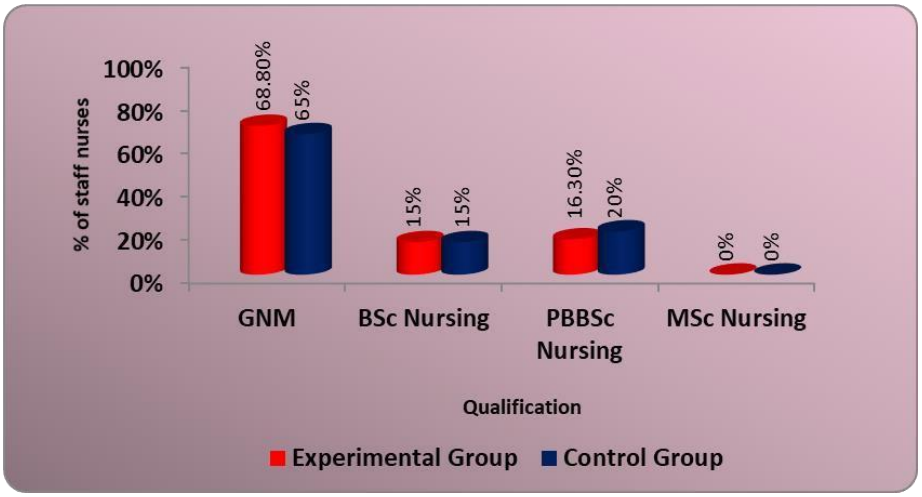

Figure 4.1.4: Percentage distribution of staff nurses according to their qualification experimental & control group

Figure 4.1.5: Percentage wise distribution of staff nurses according to their professional experience in experimental group and control group

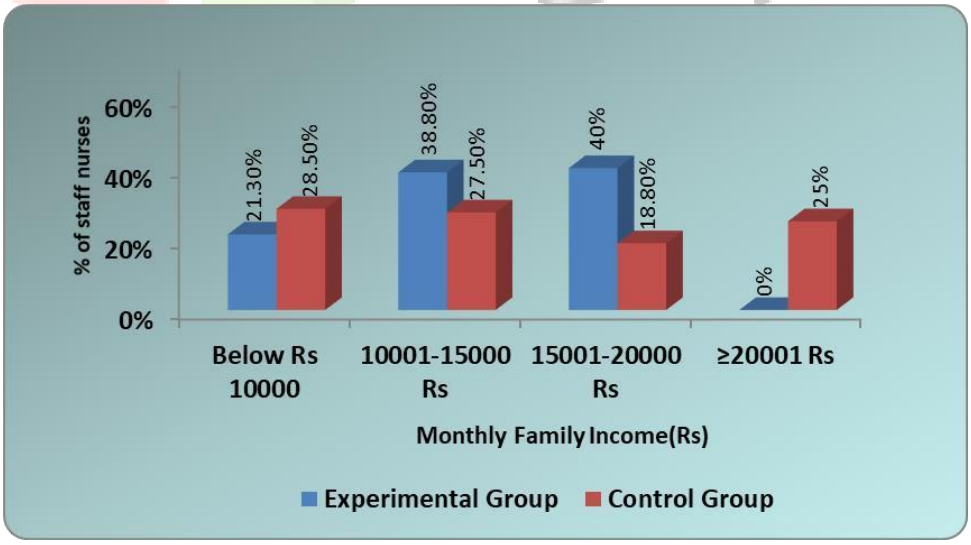

Figure 4.1.6: Percentage distribution of staff nurses according to theirmonthly income in experimental & control group

***Section II*:** Assessment of knowledge on prevention of CAUTI among staff nurses before and after intervention in experimental and control group.

4:2:1: Assessment the level of pretest knowledge score in experimental and control group

n=160

vel of pre testknowledge	Score Range	Level of Pre test Knowledge Score	
		Experimental Group	Control Group
Poor	0-20%(0-6)	6(7.5%)	8(10%)
Average	21-40%(7-12)	29(36.25%)	42(52.5%)
Good	41-60%(13-18)	44(55%)	24(30%)
Very Good	61-80%(19-24)	0(0%)	4(5%)
Excellent	81-100%(25-30)	1(1.25%)	2(2.5%)
Minimum score		3	4
Maximum score		30	26
Mean knowledge score		12.27±3.70	10.98±4.52
Mean % Knowledge Score		40.91±12.35	36.58±15.09

4.2.2 : Percentage distribution of knowledge scores on prevention ofCAUTI among staff nurses in experimental and control group after intervention Table 4.2.2 : Assessment with level of post test knowledge

n=160

el of post testknowledge	**Score Range**	**Level of Post test Knowledge Score**	
		Experimental Group	**Control Group**
Poor	0-20%(0-6)	11(13.75%)	19(23.75%)
Average	21-40%(7-12)	17(21.25%)	31(38.75%)
Good	41-60%(13-18)	27(33.75%)	24(30%)
Very Good	61-80%(19-24)	18(22.5%)	4(5%)
Excellent	81-100%(25-30)	7(8.75%)	2(2.5%)
Minimum score		2	3
Maximum score		28	26
Mean knowledge score		14.86±6.49	10.91±5.04
Mean % Knowledge Score		49.54±21.63	36.37±16.81

4.2.3 : Area wise percentage distribution of knowledge scores on among staff nurses in experimental and control group after intervention

n=160

Area	mber ofitems	Knowledge in %	
		erimentalgroup	ontrolgroup
General information regardingCAUTI	10	12.55%	2.65%
Factor influencing CAUTI	8	17.11%	4.13%
Prevention measure of CAUTI	12	33.64%	4.78%

4.2.4 : Area wise Mean & SD of knowledge scores on prevention of CAUTI among staffnurses in experimental and control group after intervention

n=160

Area of Knowledge	mber ofitems	erimentalGroup	ControlGroup
		Mean ± SD	Mean ± SD
General information regardingCAUTI	10	5.20±2.07	4.40±1.17
Factor influencingCAUTI	8	3.90±2.10	2.78±1.81
Preventive measure of CAUTI	12	5.76±2.99	3.72±2.85

SECTION -III: Significant difference in the post-test knowledge scores on prevention ofCAUTI among staff nurses in control and experimental group

4.3.1 : Significant difference between pre-test and post-test knowledge score on post burnexercise among staff nurses in control and experimental group

Test	Mean	SD	Mean Difference	t-value	p-value
Pre Test	12.27	3.70	2.58±6.43	3.59	0.001 S,p<0.05
Post Test	14.86	6.49			

Significance of difference between knowledge score in pre and post test of staff nurses in control group
N=80

Test	Mean	SD	Mean Difference	t-value	p-value
Pre Test	10.97	4.52	0.06±6.44	0.08	0.93 NS,p>0.05
Post Test	10.91	5.04			

4.3.2 : Area wise Significant difference between pre-test and post-test knowledge scoreon prevention of CAUTI among staff nurses in experimental group and control group.

n=160

Area of knowledge	EXPERIMENTAL GROUP				CONTROL GROUP			
	Pre-test Mean ±SD	Post-test Mean ±SD	't' value	p value	Pre-test Mean ±SD	Post-test Mean ±SD	't' value	p value
General information regarding CAUTI	4.62±1.23	5.20±2.07	2.58	0.012,S	4.52±1.33	4.40±1.17	0.65	0.51,NS
Factor influencing CAUTI	3.33±1.28	3.90±2.10	2.54	0.013, S	2.90±2.10	2.78±1.81	0.44	0.66,NS
Preventive measure of CAUTI	4.31±1.85	5.76±2.99	4.22	0.0001,S	3.55±2.81	3.72±2.85	0.37	0.71,NS

*P value<0.0001 ***highly significant, P value<0.001 **moderately significant, P value<0.05 * Significant*

4.3.3 : Significant difference in the post test knowledge scores of staff nurses between control and experimentalgroup

n=160

Group	Test	Mean ±SD	Mean difference	df	't' value	Table value
Control	Post-Test	10.91±5.04	3.95±9.82	1.98	3.59	0.001 S,p<0.05
Experimental	Post-test	14.86±14.86				

*df 158 P value<0.0001 ***highly significant, P value<0.001 **moderately significant, P value<0.05 *significant*

SECTION -IV: Association between post-test knowledge score on prevention of CAUTIamong staff nurses with their demographic variables in experimental group.

4.4.1 Association of post-test knowledge on prevention of CAUTI among staff nursewith their age in years.

n=80

Age (yrs.)	. of staffnurses	Mean post-tes knowledge score	t-value	p-value
21-30 yrs.	64	12.82±5. 29	7.18	0.0001 S,p<0.05
31-40 yrs.	16	23±3.94		
41-50 yrs.	0	0		
≥51 yrs.	0	0		

df – 79, table value –0.50, NS- not significant

4.4.2 Association of post-test knowledge on prevention of CAUTI among staff nursewith their gender.

n=80

Gender	of staffnurses	Mean posttes knowledge score	t-value	p-value
Male	7	11.85±7.38	1.28	0.20 Ns,p>0.05
Female	73	15.15±6.38		

df -79, table value – 0.96 , NS- not significant

4.4.3 Association of post-test knowledge on prevention of CAUTI staff nurse withtheir in experimental group.

n=80

Religion	No. OfstaffNurses	Mean post-tes knowledge score	F-value	P-value
Hindu	50	15.72±6.65	0.82	0.42 Ns,p>0.05
Muslim	7	13.71±6.65		
Buddhists	11	13.90±7.50		
Cristian	12	12.83±4.50		

df – 3.76, table value – 0.5, NS- not significant

4.4.4 Association of posttest knowledge on prevention of CAUTI among staff nursewith their qualification

n=80

Qualification	of staffnurses	Mean posttest knowledge score	F-value	p- value
GNM	55	15.21±6.38	0.27	0.75 Ns,p> 0 .05
BSc(N)	12	14.33±7.15		
P.B.BSc(N)	13	13.84±6.70		
MSc(N)	00	0±0		

df;2,77, table value – 0.917 , NS- not significant

: Association between post-test knowledge score and work experience

Work Experience	*F*	Mean & SD	F value	P value
5 yrs. and below	44	14.31±6.58	3.62	0.031 S,p<0.05
6 to 10 yrs.	34	16.17±5.97		
11 to 15 yrs.	2	4.50±0.70		
16 yrs. and above	0	0±0		

*df – 2,77, table value – **0.5,** NS- not significant*

4.4.6 Association of posttest knowledge score monthly income

n=80

Monthly income	*f*	Mean & SD	F-value	P value
Rs. 10000/- & below	17	14.58±6.15	2.03	0.13 NS,p>0.0
Rs. 10001/- to Rs. 15000/-	31	13.29±6.94		
Rs. 15001/- to 20000/-	32	16.53±5.96		

n=80

Rs. 20001/- & above	0	0±0		5

df - 79, table value – 0.03, NS- not significant

. Discussion

Highest percentages (53.8%% & 80%) were belonged to the age group of21–30 years in control & experimental group respectively whereas, only <4% of them were 51 years & above in both groups. Majority (94% & 91%) of staff nurses were females in both the groups. One third of the staff nurses (62.5%) were Hindus in experimental group and control groupwhereas the nurses with other religions were<35%.Highest percentages (68.80 % & 65%) of nurses were with GNM qualification inexperimental & control group respectively. Majority of staff nurses (56.3% & 55%) had 5 years & below experience in both thegroups .Pre-test and post-test percentage of knowledge scores were more or less similar in control group whereas post-test knowledge score in experimental group was significantly increased from 33.1% to 46 % making a difference in the knowledge percentages .Pre-test and post-test mean knowledge scores were more or less similar in control group whereas post-test mean knowledge score in experimental group was increased from 10.98±4.52 to12.27±3.70 making a huge difference in the mean knowledge scores .Highly significant difference (p<0.0001) was found with a 't' value of 11.4 between a pre-test & post-test knowledge score in experimental group whereas thecalculated 't' value of 2.8 between a pre-test and post-test knowledge score shows not significant difference in control group.

Highly significant difference ($p<0.0001$) was found with a 't' value of 7.3 between post-test of control group & experimental group. There is no significant association ($p>0.05$) between post-test knowledge score and age, gender,religion, qualification, work experience, monthly income in experimental group

Conclusion

It was concluded that the demographic variables of staff nurses in control and experimental group were more or less similar, revealing both the groups had similar characteristics. Percentage of knowledge and the mean scores of staff nurses were more or less similar in both the groups before intervention. However, after an intervention, the percentage of knowledge and the mean scores of staff nurseswere significantly increased in experimental group whereas it was remained unchanged in controlgroup. There was a significant difference between pretest and post-test knowledge scores in experimental group.

And, there was also a significant difference between the post tests of controland experimental group.

Thus, it was concluded that teaching through VATM on prevention of CAUTI was effective among staff nurses working in selected hospitals, Maharashtra.

VI. Acknowledgement

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