

# Effectiveness of Structured Teaching Module (STM) on Pin-Tract Infections (PTI) in External Fixation among Floor Nurses Serving in Selected Hospitals, Maharashtra

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**Abstract:** Aim of the study: The study aims to find out the effect of Structured Teaching Module (STM) On Pin-Tract Infections (PTI) in External Fixation among Floor Nurses. Problem statement: What is the Effect of Structured Teaching Module (STM) On Pin-Tract Infections (PTI) in External Fixation Among Floor Nurses Serving in Selected Hospitals, Maharashtra? Primary objective: The primary objective of the study was to assess the effect of STM on knowledge regarding PTI in External Fixation among Floor Nurses. Secondary objectives: 1) To assess the knowledge of Floor Nurses on PTI in External Fixation in experimental and comparison group before intervention 2) To assess the knowledge of Floor Nurses on PTI in External Fixation in experimental and comparison group after intervention 3) To find out the effect of STM on PTI in External Fixation among Floor Nurses 4) To find out the association between post-test knowledge scores on PTI in External Fixation and demographic variables of Floor Nurses in experimental group. Method: A quasi-experimental design with non-randomized comparison group was used to assess the effect Structured Teaching Module (STM) On Pin-Tract Infections (PTI) in External Fixation among 150 Floor Nurses. The data was collected by using self-administered questionnaire. Results: From the findings, it was observed that the pre-intervention demographic variables of floor nurses in comparison and experimental group were more or less similar revealing both the groups had similar characteristics. It was observed that the percentages of knowledge (comparison group; 51.4% & experimental group; 47.5%) on pin-tract infection in external fixation among floor nurses were more or less similar before intervention. However, after an intervention, the percentage of knowledge on pin-tract infection in external fixation was significantly increased from 47.5% to 83.5% in experimental group whereas it was almost remained unchanged in comparison group. There was a significant difference ( $p < 0.0001$ ) between pre-test and post-test knowledge scores in experimental group. And, there was also a significant difference ( $p < 0.0001$ ) between the post tests of comparison and experimental group. No significant association ( $p > 0.05$ ) was found between knowledge on pin-tract infection and age, gender, religion, qualification, professional experience, & income of floor nurses. Interpretation and conclusion: The data were analyzed by applying descriptive and inferential statistic. The result of the study indicated that after intervention there was an improvement in the knowledge score. Analysis of data shows that highly difference found between the pre-test and post-test knowledge scores at the level of ( $p < 0.05$ ). The hypothesis proved and accepted.

**Keywords:** STM Structured Teaching Module), (Pin-Tract Infections), SAQ (Self-Administered questionnaire), % (Percentage)

## 1. Introduction

External fixation has become a key tool in the orthopaedic modern era, being used both in traumatology and reconstructive surgery to manage musculoskeletal conditions such as complex fractures or limb deformity<sup>1</sup>

External fixator devices are applied using a surgical procedure whereby pins and/or wires are inserted through the skin into the bone. The pins and wires are then secured using a system of clamps, connectors or circular rings to create a scaffold system. The sites where the pins or wires enter the skin are commonly referred to as pin sites. External fixation is attached to a stabilizing structure on the outside of the body.<sup>2</sup>

Installation of the external fixator is performed in an operating room, normally under general anesthesia. Removal of the external frame and bolts usually requires special wrenches and can be done with no anesthesia in an office visit.<sup>3</sup> The length of time external fixator devices are used depends on the nature of the condition being treated and the presence of co-morbidities or infection that may affect healing, and can last from several weeks to many months.<sup>2</sup>

External fixation is associated with high rates of morbidity, especially when a prolonged application ranging from 1% to 100%. This great discrepancy in reported incidences of PTI is partly due to the lack of uniform definition.<sup>4</sup>

## 2. Need for the Study

External fixation is a surgical technique used to manage musculoskeletal conditions such as complex fractures or limb deformity. External fixator devices are applied using a surgical procedure whereby pins and/or wires are inserted through the skin into the bone.<sup>11</sup>

External fixation is associated with high rates of morbidity, especially when a prolonged application is necessary, being one of the most common problems encountered, with reported rates ranging from 1% to 100%. This great discrepancy in reported incidences of PTI is partly due to the lack of a uniform definition and classification system for the determination and quantification of pin-tract infections.<sup>12</sup>

Volume 12 Issue 7, July 2023

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Pin tract infection is the major complication of external fixation of fractures. The rates of infection range from 0.5% to 70% in developing countries. Pin tract infections can decrease the stability of the pin-bone interface. Conversely, instability of the fixator-pin-bone construct can lead to half-pin loosening and infection.<sup>13</sup>

Incidences of PTI during limb lengthening and lower-limb reconstruction are elevated from 25% to 36%. The high incidence (41.7%) of PTI reported in limb reconstruction surgery may be related to the long periods of time spent in the external fixator and high demands placed on the bone-pin interface during either bone transport or deformity correction.<sup>1</sup>

### 3. Review of Literature

Review of literature was carried out on recent and ongoing research relevant to the present study.

After thorough review, investigator has classified the literature based on variables which support aims and objectives of study.

The literature as follows –

- 1) Reviews related to Incidence and prevalence of pin-tract Infections in external fixation
- 2) Reviews related to General information on external fixation
- 3) Reviews related to Pin-tract wounds / infections and its associated factors
- 4) Reviews related to Knowledge of nurses on pin-tract infections
- 5) Reviews related role of nurse in prevention of pin-tract infections
- 6) Reviews related Structured teaching module as method of health education

#### Assumptions

- Floor nurses may have some knowledge on PTI in external fixation
- The STM on PTI in external fixation may influence on knowledge of floor nurses
- The demographic variables may influence on knowledge of floor nurses with regarding pin tract infection

#### Delimitations:

The study was limited to-

- assessment of knowledge
- 150samples
- floor nurses serving in selected hospitals
- study was limited to private hospitals

#### Hypothesis:

H1: There is a significant difference between the pre-test and post-test knowledge scores on PTI in external fixation among Floor Nurses in experimental and comparison group.

H2: There is a significant difference between the post-test knowledge scores of Floor Nurses in experimental and comparison groups regarding PTI in external fixation.

H3: There is a significant association between the post-test knowledge scores on PTI in external fixation and

demographic variables of Floor Nurses in experimental group.

### 4. Methodology

**Research approach:** A quantitative research approach was used for the study

**Research design:** A quasi-experimental design with non-randomized comparison group

**Variables under study:**

- Independent variable: The Structured-teaching Module
- Dependent variable: the STM on PTI was the independent variable.

**Accessible population**–floor nurses who were available for research studies were considered as accessible population.

**Sample and sampling technique**

**Sample:** staff nurses working in three selected hospitals were the samples for research study

**Sample size:** Sample size was 150 however. it was calculated on the basis of sample size determination formula

**Sampling technique:** non-probability convenient sampling technique was used.

**Inclusion criteria:**

- Floor Nurses those who were consented to participate in the study
- Floor Nurses those who were available at the time of data collection
- Floor Nurses those who are registered in state nursing council

**Exclusion criteria:**

- Floor Nurses who underwent certificate course / diploma course in orthopaedics

#### Tool Preparation

**Development of tool:**

The tools were developed on the basis of research question and conceptual framework. The investigator has undergone extensive review of literature to develop the tools. However, the following efforts were made by the investigator prior to construction of tools.

- Reviews from various resources like textbooks, journals, periodicals, magazines, published thesis, newsletter etc
- Consultation and discussion with peer group, nursing experts, and others concerned.
- Personal and professional experience of investigator with Staff nurses.
- Preparation and revision of blue print/draft and subject content prior to final draft.

After such deliberations, the investigator has constructed self-administered questionnaire and Self-Instructional module for data collection.

**Description of Tools:**

1) **Self-administered questionnaire (SAQ):** This tool was constructed to assess the knowledge of floor nurses regarding PTI in external fixation before and after the intervention in experimental comparison and group. The SAQ contains some questions/statements (MCQs) on PTI in external fixation and some on demographic variables of floor nurses serving in selected hospitals.. It has two parts; Part-A and Part-B

**Part A:** seeks information on demographic variables of floor nurses serving in selected hospitals. The variable includes; age, gender, religion, qualification, professional experience, and income.

**Part B:** is related to questions/statements that seek information on PTI in external fixation among floor nurses serving in selected hospitals. It contains 04 sections / areas they were; general information on external fixation, pin-tract infections, nursing care of pin-tract infections, and role of nurse in prevention of pin-tract infections

**Tool Validity**

Content validity of SAQ and STM were established in consultation with 10 experts from the field of medical surgical nursing (n=6), orthopedician (n=3) statistician (n=1), and a language expert (n=1).

**Tool Reliability**

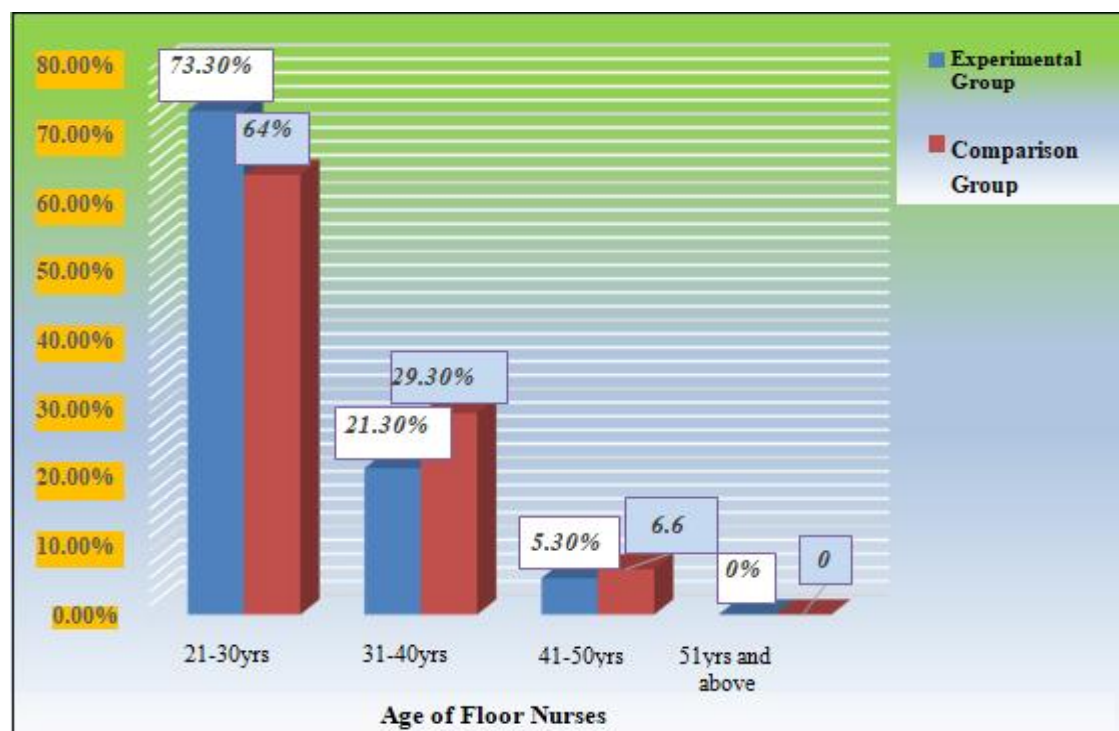
Data was collected from 15 staff nurses who were working in selected hospital (other than the main study area) to test reliability of SAQ. The Split-half technique was used where Karl Pearson's correlation coefficient was calculated. The tool was found to be reliable ( $r=0.9$ )

**Pilot Study**

Pilot study was conducted among conveniently selected floor nurses (15) to find out the effect of STM on PTI in external fixation at two selected hospitals, after a prior permission from the authorities concerned. Informed consent was obtained from the floor nurses and data was collected during the month of January 2021.

**Plan for Data Analysis**

Collected data from floor nurses was planned to analyze by using descriptive and inferential statistics. The descriptive statistics includes; percentage, mean, mean percentage and standard deviation. The inferential statistics includes; t test and one-way ANOVA using SPSS software.

**5. Results****Section I: Distribution of floor nurses according to their demographic variables in experimental and Comparison group**

**Figure 4.1.1:** Distribution of floor nurses according to age

Distribution of floor nurses according to their age reveals that the highest percentage (64% & 73.3%) were belonged to the age group of 21–30 years in comparison & experimental group respectively. In addition, more or less similar percentages (29.3% & 21.3%) were in the age group of 31–40 years in comparison & experimental group respectively. Further, (6.6% & 5.3%) of floor nurses were in the age group of 41-50 years in comparison & experimental group

respectively. Further, none of floor nurses were in the age group of 51 years & above years in both groups (figure – 4.1.1).

Hence, it was interpreted that the age distribution of floor nurses in both the groups were more or less similar. In addition, it was also concluded that almost maximum of floor nurses were below the age of 40.

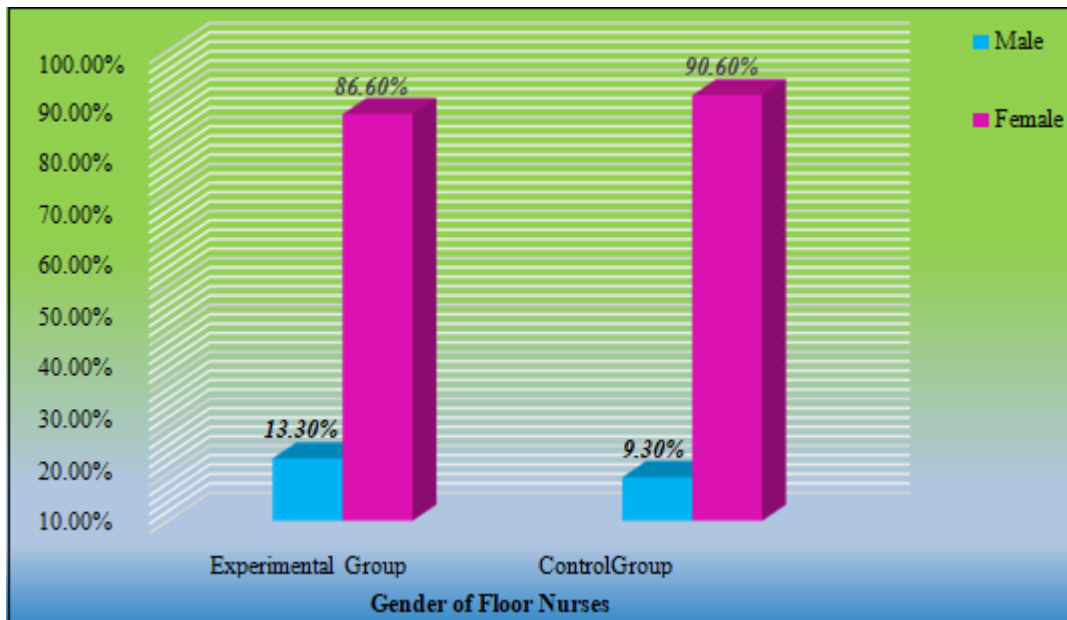


Figure 4.1.2: Distribution of floor nurses according to gender

Gender distribution of floor nurses depicts that the majority (90.6% & 86.6%) of them were females in comparison & experimental group respectively whereas males were (9.3% & 13.3%) comparison & experimental group respectively (figure – 4.1.2).

Hence, it was interpreted that the gender distribution of floor nurses were more or less similar in both the groups though it was dominated by female nurses

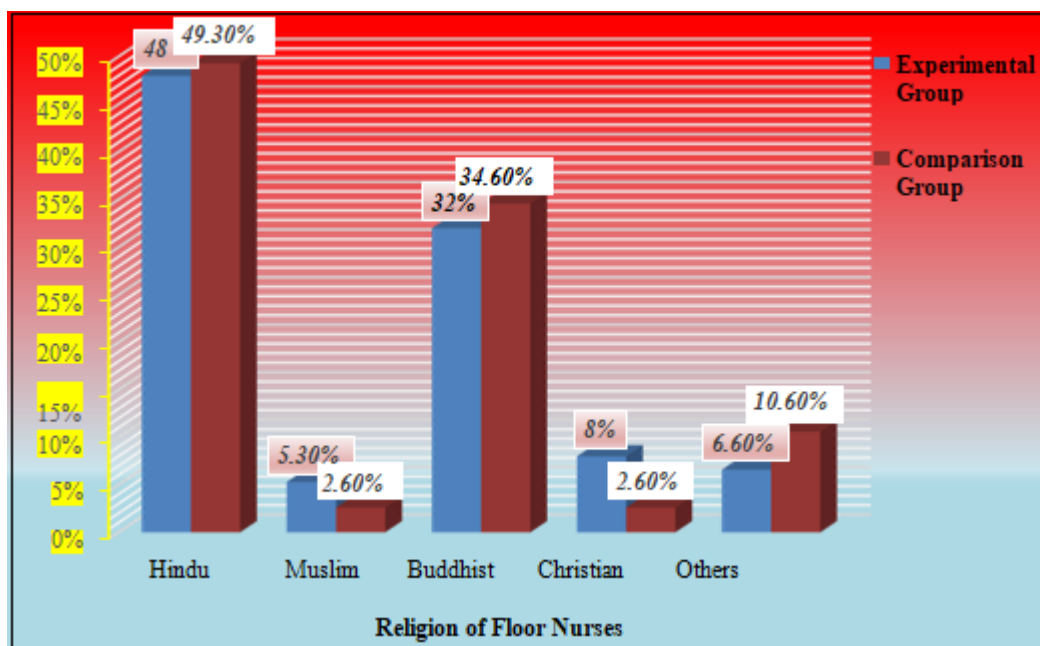


Figure 4.1.3: Distribution of floor nurses according to religion

Distribution of floor nurses according to religion depicts that around half of them (48% & 49.3%) were Hindus in experimental group and comparison group whereas the nurses with other religions were <10%. However, the nurses with Buddhist religion were around 34% in both the groups (Figure – 4.1.3).

Hence, it can be interpreted that the place of study was slightly dominated by Buddhist religion when compared to the latest census of India. It was also concluded that religion wise distribution of floor nurses in both groups were more or less similar.

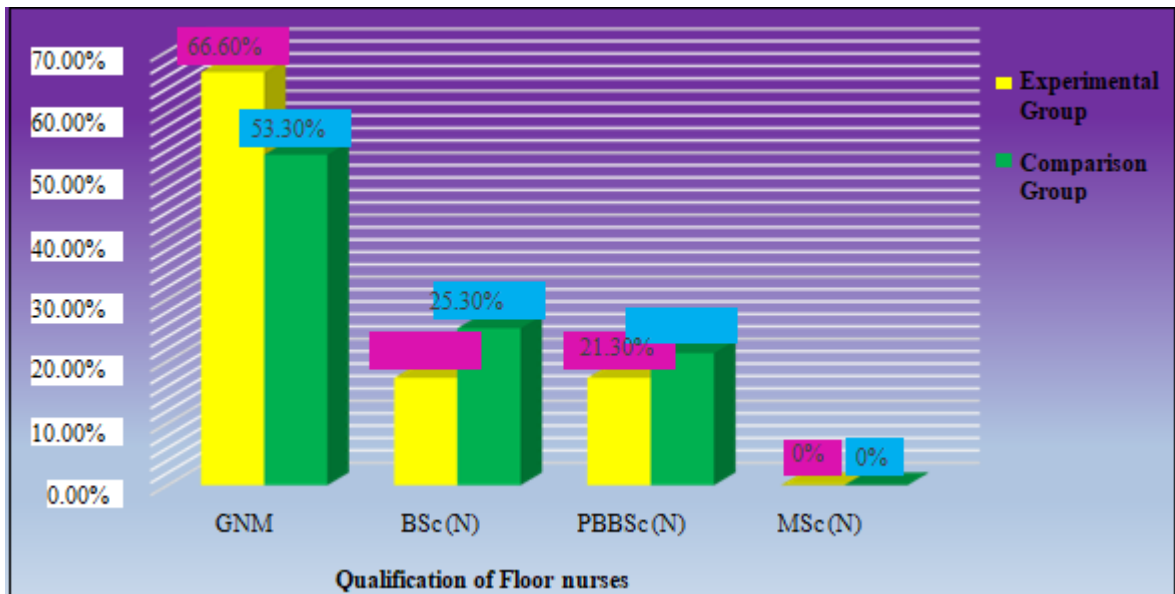


Figure 4.1.4: Distribution of staff nurses according to qualification

Distribution of floor nurses according to qualification shows that highest (66.6 % & 53.3%) were with GNM qualification in experimental & comparison group respectively, whereas the nurses with other qualifications were <25% in both the groups (Figure – 4.1.4).

Therefore, it can be interpreted that the place of study was dominated by registered nurses with a GNM qualification. It was also concluded that the distribution of nurses according to qualification were more or less similar in both the groups.

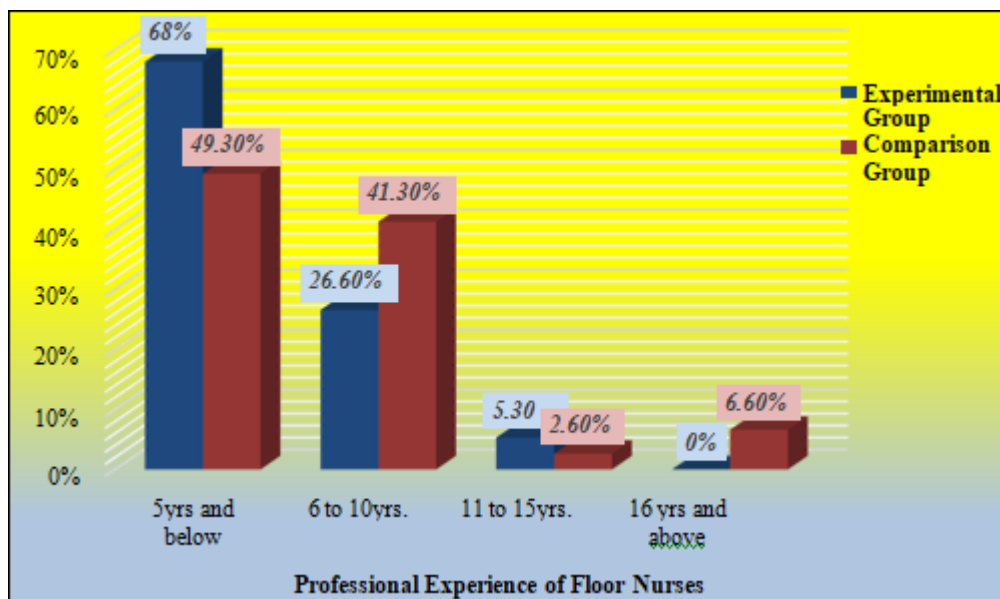


Figure 4.1.5: Distribution of floor nurses according to their experience

The professional experience of floor nurses depicts that around majority of them (68% & 49.3%) had 5 years & below experience in experimental & comparison group respectively. However (26.6% & 41.3%) had 6 years o – 10 years of experience in experimental & comparison group respectively. However, the nurses with 11 & above year of experience were <7% (Figure – 4.1.5).

Collectively it reveals that most were had <10 years of professional experience. Hence, it was interpreted that the experience of floor nurses were more or less similar in both the groups.

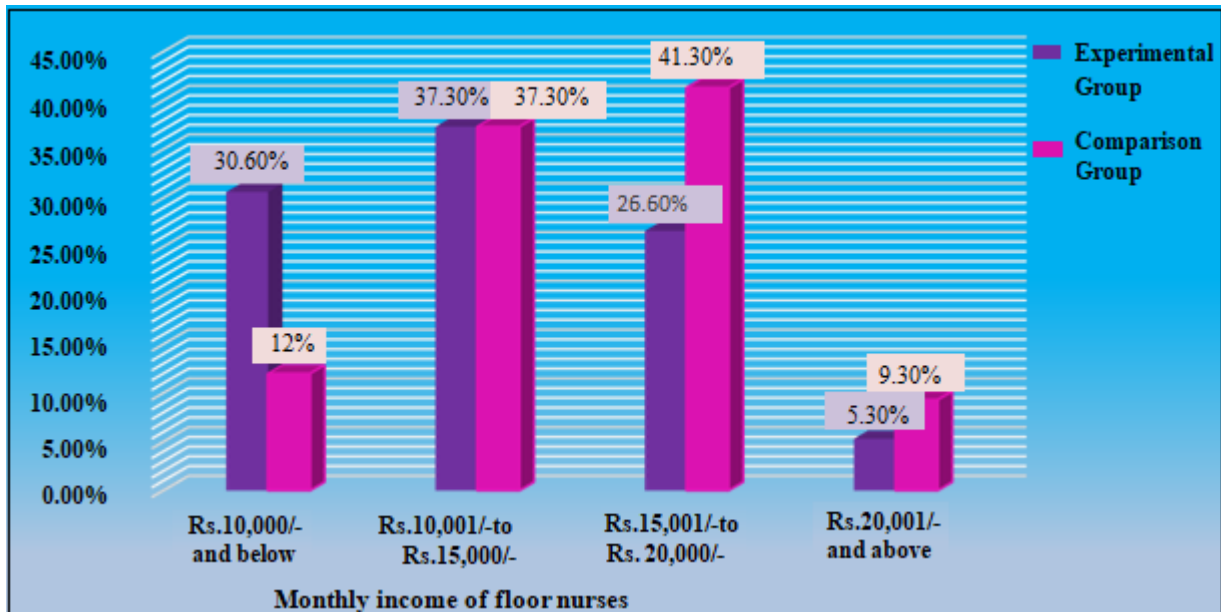


Figure 4.1.6: Distribution of staff nurses according to their income

Figure-4.1.6: Distribution of floor nurses according to their income Distribution according to income reveals that the floor nurses belonged to the income group Rs. 10000 and below, Rs. 10001–15000/-and Rs. 15001–20000/-were around 40% in both experimental & comparison group. Whereas, nurses belonged to the income group Rs. 20000/- and above were <9% (figure – 4.1.6).

Hence, it was interpreted that the income distribution of floor nurses were not so similar.

**Section II: Assessment of knowledge on PTI among floor nurses before intervention in experimental group and comparison group**

**Table 4.2.1:** Percentage distribution of knowledge scores on PTI among floor nurses in experimental and comparison group before intervention, n=150

Level of knowledge	Comparison group		Experimental group	
Poor	0	0%	0	0%
Average	25	37%	14	38.5%
Good	32	54.2%	53	49%
Very good	18	66.6%	6	69%
Excellent	0	0%	0	0%
Overall	75	51.4%	75	47.5%

**Table 4.2.2:** Mean & SD knowledge scores on PTI in external fixation among floor nurses in experimental and comparison group before intervention, n=150

Level of knowledge	Comparison group		Experimental Group	
	f	Mean± SD	f	Mean± SD
Poor	0	0± 0	0	0± 0
Average	25	14.8± 0.5	16	13.5± 2.1
Good	32	21.6± 2	53	19.6± 1.9
Very good	18	26.6± 1.8	6	27.6± 1.5
Excellent	0	0± 0	0	0± 0
Overall	75	20.5± 4.8	75	19± 4

**Table 4.2.3:** Area wise percentage distribution of knowledge scores on PTI in external fixation among floor nurses in experimental and comparison group before intervention, n=150

Area of Knowledge	Number of items	Knowledge in %	
		Comparison group	Experimental group
General information on external Fixation	05	66.6%	51.2%
Pin-tract infection	05	52.8%	47.7%
Nursing care of Pin-tract infection	15	47.4%	48.7%
Role of nurses in prevention of PTI	15	49.9%	44.9%
Overall	40	51.4%	47.5%

**Table 4.2.4:** Area wise Mean & SD knowledge scores on PTI in external fixation among floor nurses in experimental and comparison group before intervention, n=150

Area of Knowledge	Number of items	Comparison group		Experimental group	
		Mean	SD	Mean	SD
General information on External fixation	05	3.3	1	2.5	1
Pin-tract infection	05	2.6	1.2	2.3	1.4
Nursing care of PTI	15	7	1	7.3	2.5
Role of nurses in Prevention of PTI	15	7.4	2.7	6.7	2.5
Overall	40	20.5	4.8	19	4

**Section III**  
**Section III: Comparison of knowledge scores PTI in external fixation among floor nurses after intervention in experimental group and comparison group**

**Table 4.3.1:** Comparison of knowledge percentage on PTI in external fixation among floor nurses in experimental and comparison group after intervention, *n*=150

Level of knowledge	Comparison group				Experimental group			
	Pretest		Posttest		Pretest		Posttest	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Poor	0	0%	0	0%	0	0%	0	0%
Average	25	37%	22	36.9%	14	38.5%	1	30%
Good	32	54.2%	32	53.5%	53	49%	1	57.5%
Very good	18	66.6%	21	67%	6	69%	18	75%
Excellent	0	0%	0	0%	0	0%	55	87.7%
Overall	75	51.4%	75	52.5%	75	47.5%	75	83.5%

**Table 4.3.1:** Comparison of knowledge percentage on PTI in external fixation among floor nurses in experimental and comparison group after intervention, *n*=150

Level of knowledge	Comparison group				Experimental group			
	Pretest		Post test		Pretest		Post test	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Poor	0	0%	0	0%	0	0%	0	0%
Average	25	37%	22	36.9%	14	38.5%	1	30%
Good	32	54.2%	32	53.5%	53	49%	1	57.5%
Very good	18	66.6%	21	67%	6	69%	18	75%
Excellent	0	0%	0	0%	0	0%	55	87.7%
Overall	75	51.4%	75	52.5%	75	47.5%	75	83.5%

**Table 4.3.2:** Comparison of Mean knowledge percentage & SD on PTI in external fixation among floor nurses in experimental and comparison group after intervention, *n*=150

Level of knowledge	Comparison group				Experimental group			
	Pre test		Post test		Pre test		Post test	
	<i>f</i>	Mean± SD	<i>F</i>	Mean± SD	<i>f</i>	Mean± SD	<i>f</i>	Mean± SD
Poor	0	0± 0	0	0	0	0± 0	0	0
Average	25	14.8± 0.5	22	14.7± 0.9	16	13.5± 2.1	1	12± 0
Good	32	21.6± 2	32	21.4± 2.3	53	19.6± 1.9	1	23± 0
Very good	18	26.6± 1.8	21	26.8± 1.8	6	27.6± 1.5	18	30± 1.9
Excellent	0	0± 0	0	-	0	0± 0	55	35± 1.2
Overall	75	20.5± 4.8	75	21± 4.9	75	19± 4	75	33.4± 1.2

**Table 4.3.3:** Comparison of area wise knowledge percentage on PTI in external fixation among floor nurses in experimental and comparison group, *n*=150

Area of Knowledge	Number of items	Comparison group		Experimental group	
		Pretest	Post test	Pretest	Post test
General information on external fixation	05	66.6%	66.4%	51.2%	90.4%
Pin-tract infection	05	52.8%	53%	47.7%	85.8%
Nursing care of PTI	15	47.4%	48.8%	48.7%	81.6%
Role of nurses in prevention of PTI	15	49.9%	51.3%	44.9%	82.3%
Overall	40	51.4%	52.7%	48.1%	82.8%

**Table 4.3.4:** Comparison of area wise Mean knowledge scores & SD on PTI in external fixation among floor nurses after intervention in experimental and comparison group knowledge scores, *n*=150

Area of Knowledge	Number of items	Comparison group				Experimental group			
		Pre-test		Post-test		Pre-test		Post-test	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD
General information on external fixation	05	3.3	1	18.3	15.3	2.5	1	4.5	0.7
Pin-tract infection	05	2.6	1.2	2.6	1.2	2.3	1.4	4.2	0.7
Nursing care of Pin-tract infection	15	7	1	7.3	2	7.3	2.5	12.2	1.8
Role of nurses in prevention of Pin-tract infection	15	7.4	2.7	7.7	2.7	6.7	2.5	12.3	2.2
Overall	40	20.5	4.8	21	4.8	19	4	33.4	3.8

**Section IV**

**Section IV: Significant difference in the post test knowledge scores on PTI in external fixation among floor nurses in comparison and experimental group**

**Testing of hypothesis**

H1: There is a significant difference between pretest and post-test knowledge score on PTI in External Fixation among floor nurses in experimental and comparison group.

**Table 4.4.1:** Significant difference between pre-test and post-test knowledge score on PTI in External Fixation among floor nurses in comparison and experimental group,  $n=150$

Group	Test	Mean $\pm$ SD	Mean difference	df	't' value	p value
Comparison	Pretest	20.5 $\pm$ 4.8	0.5 $\pm$ 0.1	1.74	4.7	NS $p>0.05$
	Posttest	21 $\pm$ 4.9				
Experimental	Pretest	19 $\pm$ 4.1	14 $\pm$ 0.2	1.74	21.8	0.0001*** $p<0.05$
	Posttest	33.1 $\pm$ 4.3				

$P$  value  $<0.0001$  highly significant,  $P$  value  $p<0.05$  significant,  $P$  value  $p>0.05$  NS not significant

Paired 't' test was computed to find out the significant difference between pre-test and post-test knowledge score on PTI in External Fixation among floor nurses in comparison and experimental group.

Highly significant difference ( $p<0.05$ ) was found with a 't' value of 21.8 between pre-test & post-test knowledge scores in experimental group, whereas, in comparison group, the mean difference between pre-test & post-test knowledge scores among floor nurses was found to be very less (0.5 $\pm$ 0.1) with a 't' value of 4.7 which was Not Significant (table-4.4.1).

Hence, it was interpreted that the higher score of floor nurses in experimental group was due to an effect of STM on PTI in External Fixation. Therefore, the STM on PTI in External Fixation among floor nurses was considered as effective. Whereas a slight variation of value in comparison group was negligible as that might have occurred by chance and not by choice.

However, the difference observed between pre-test & post-test knowledge score value in experimental group was true difference; hence a research hypothesis was accepted.

**Table-4.4.2:** Area wise significant difference between pre-test and post-test knowledge score on PTI in External Fixation among floor nurses in comparison and experimental group,  $n=150$

Area of knowledge	Comparison group				Experimental group			
	Pre-test Mean $\pm$ S D	Post-test Mean $\pm$ S D	't' value	p value	Pre-test Mean $\pm$ S D	Post-test Mean $\pm$ S D	't' value	p value
General information on external fixation	3.3 $\pm$ 1	3.3 $\pm$ 1	1	0.3206 $p<0.05$	2.5 $\pm$ 1.1	4.5 $\pm$ 0.7	12.9	0.0001 $p<0.05$
Pin-tract infection	2.6 $\pm$ 1.2	2.6 $\pm$ 1.2	1	0.3206 $p<0.05$	2.3 $\pm$ 1.4	4.2 $\pm$ 0.7	10.3	0.0001 $p<0.05$
Nursing care PTI	7.1 $\pm$ 2	7.1 $\pm$ 2	3.5	0.0008 $p<0.05$	7.3 $\pm$ 2.5	12.2 $\pm$ 1.8	13.3	0.0001 $p<0.05$
Role of nurses in prevention PTI	7.4 $\pm$ 2.7	7.7 $\pm$ 2.7	2.9	0.0001 $p<0.05$	6.7 $\pm$ 2.5	12.3 $\pm$ 2.2	13.9	0.0001 $p<0.05$
Overall	20.5 $\pm$ 4.8	21 $\pm$ 4.9	4.7	0.0001 S. $p<0.05$	19 $\pm$ 4.1	33.1 $\pm$ 4.3	21.8	0.0001 S. $p<0.05$

$f=74$ ,  $P$  value  $<0.0001$ \*\*\*highly significant,  $P$  value  $<0.001$ \*\*moderately significant,  $P$  value  $<0.05$ not significant

Paired 't' test was computed to find out the significant difference between area wise pre-test and post-test knowledge score on PTI in External Fixation among floor nurses in comparison and experimental group.

The calculated 't' value in comparison group were similar ( $p<0.3206$ ) in the areas of General information on external fixation ('t' =1) and Pin-tract infection ('t'=1). (table-4.4.2).

Highly significant difference ( $p<0.0001$ ) was found with a 't' value of 13.9 in the area of role of nurses in prevention of

PTI when compared to other areas in experimental group but is as similar to the calculated 't' value in experimental group is ( $p<0.0001$ ) in the areas of nursing care of PTI ('t' =13.3). Hence, it was interpreted that the difference observed between pre-test & post-test area wise knowledge score of floor nurses in experimental group were due to an effect teaching through STM on PTI in External Fixation.

H2: There is a significant difference in post-test knowledge scores on PTI among floor nurses between comparison and experimental group.

**Table 4.4.3:** Significant difference between the post-test knowledge scores of comparison and experimental group,  $n=150$

Group	Test	Mean $\pm$ SD	Mean difference	Df	't' value	p value
Comparison	Post-test	21.0 $\pm$ 4.9	12.1 $\pm$ 0.6	148	15.8	0.0001***
Experimental	Post-test	33.1 $\pm$ 4.3				

$df=74$ ,  $P$  value  $<0.0001$ \*\*\*highly significant,  $P$  value  $<0.001$ \*\*moderately significant,  $P$  value  $<0.05$  not significant

Unpaired 't' test was computed to find out the significant difference between the post-test knowledge scores of comparison and experimental group. Highly significant difference ( $p<0.0001$ ) was found between the post-test of comparison group and experimental group with a calculated 't' value of 15.8 (table-4.4.3).

Hence, it was interpreted that highly significant difference between the post-test knowledge score was due to an effect of teaching through STM on PTI in External Fixation among floor nurses. Therefore, the STM as a teaching tool on PTI in External Fixation among floor nurses was considered as effective.



## Section V

**Section V: Association between post-test knowledge scores on PTI in External Fixation and demographic variables of floor nurses in experimental group**

## Testing of hypothesis

H3: There is a significant association between the post-test knowledge score on PTI in External Fixation and age in years of floor nurses in experimental group.

**Table No-4.5.1:** Association between post-test knowledge score and age,  $n=75$ 

Age in years	<i>f</i>	Mean & SD	F value	P value
21-30years	55	32.8±4.7	0.2879	0.7507 NSp>0.05
31-40years	16	33.6±2.9		
41-50years	4	34±4.6		
≥51years	0	0±0		

*df*-2, 72  $p$  value>0.05 NS-Not significant

Analysis of variance (F-test) was computed to find out the significant association between the post-test knowledge score and the age of floor nurses. The finding of F value shows that there is a significant association ( $p>0.05$ ) between post-test knowledge score and age.

Hence, it was interpreted that the age of floor nurses were associated with the knowledge on PTI in External Fixation. However, the F value was true difference and not by chance. Therefore, the research hypothesis is accepted.

SECTION-V: Association between post-test knowledge scores on PTI in External Fixation and demographic variables of floor nurses in experimental group.

**Testing of hypothesis**

H3: There is a significant association between the post-test knowledge score on PTI in External Fixation and gender in years of floor nurses in experimental group.

**Table No-4.5.2:** Association between post-test knowledge score and gender,  $n=75$ 

Gender	<i>f</i>	Mean & SD	F value	P value
Male	10	34.3±2.0	0.84501	0.8402 NSp>0.05
Female	65	32.9±4.5		

*df*; 1, 73,  $p$  value>0.05, NS-Not significant

Analysis of variance (F-test) was computed to find out the significant association between the post-test knowledge score and the gender of floor nurses. The finding of F value shows that there is no significant association ( $p>0.05$ ) between post-test knowledge score and gender.

Hence, it was interpreted that the gender of floor nurses was not associated with the knowledge on PTI in External Fixation. However, the F value was by chance and not true difference. Therefore, the research hypothesis was rejected.

SECTION-V: Association between post-test knowledge scores on PTI in External Fixation and demographic variables of floor nurses in experimental group.

**Testing of hypothesis**

H3: There is a significant association between the post-test knowledge score on PTI in External Fixation and religion of floor nurses in experimental group.

**Table No-4.5.3:** Association between post-test knowledge score and religion,  $n=75$ 

Religion	<i>F</i>	Mean & SD	F value	P value
Hindu	36	32.8±4.4	1.4901	0.2145 NSp>0.05
Muslim	4	33.2±3.5		
Buddhist	24	33.8±2.7		
Christian	6	35.1±1.6		
Others	0	00±00		

*df*; 3, 71,  $p$  value>0.05, NS-Not significant

Analysis of variance (F-test) was computed to find out the significant association between the post-test knowledge score and the religion of floor nurses. The finding of F value shows that there is no significant association ( $p>0.05$ ) between post-test knowledge score and religion.

Hence, it was interpreted that the religion of floor nurses was not associated with the knowledge on PTI in External Fixation. However, the F value was by chance and not true difference. Therefore, the research hypothesis was rejected.

H3: there is a significant association between the post-test knowledge score on PTI in External Fixation among floor nurses and their qualification in experimental group.

**Table No-4.5.4:** Association between post-test knowledge score and qualification

Qualification	<i>F</i>	Mean & SD	F value	P value
GNM	50	33.1±4.3	0.5132	0.6007 NSp>0.05
B.Sc.(N)	13	32.3±5.8		
PB.B. Sc(N)	12	34.0±1.7		
M.Sc.(N)	0	0±0		

*df*-2, 72,  $p$  value>0.05, NS-Not significant

Analysis of variance (F-test) was computed to find out the significant association between the post-test knowledge score and the qualification of floor nurses. The finding of F value shows that there is no significant association ( $p>0.05$ ) between post-test knowledge score and qualification.

Hence, it was interpreted that the qualification of floor nurses was not associated with the knowledge on PTI in External Fixation. However, the F value was by chance and not true difference. Therefore, the research hypothesis was rejected.

SECTION-V: Association between post-test knowledge scores on PTI in External Fixation and demographic variables of floor nurses in experimental group.

**Testing of hypothesis**

H3: there is a significant association between the post-test knowledge score on PTI in External Fixation among floor nurses and their work experience in experimental group.

**Table No-4.5.5:** Association between post-test knowledge score and work experience,  $n=75$ 

Work Experience	f	Mean & SD	F value	P value
5 years & below	51	32.7±4.8	0.9532	0.3903 NS $p>0.05$
6 -10years	20	33.6±2.9		
11-15 years	4	35.5±1.7		
16 years & above	0	0±0		

$df=2, 72, p\text{ value}>0.05, NS\text{-Not significant}$

Analysis of variance (F-test) was computed to find out the significant association between the post-test knowledge score and the work experience of floor nurses. The finding of F value shows that there is no significant association ( $p>0.05$ ) between post-test knowledge score and work experience.

Hence, it was interpreted that the work experience of floor nurses was not associated with the knowledge on PTI in External Fixation. However, the F value was by chance and not true difference. Therefore, the research hypothesis was rejected.

H3: there is a significant association between the post-test knowledge score on PTI in External Fixation among floor nurses and their monthly income in experimental group.

**Table No-4.5.6:** Association between post-test knowledge score and monthly income,  $n=75$ 

Monthly income	f	Mean & SD	F value	P value
Rs. 10000/- & below	23	33.2±5.2	0.808	1.1506 NS $p>0.05$
Rs.10001/-to Rs.15000/-	28	32.3±4.6		
Rs.15001/- to 20000/-	20	33.6±2.9		
Rs.20001/- & above	4	35.5±1.7		

$f; 3, 71, p\text{ value}>0.05, NS\text{-Not significant}$

Analysis of variance (F-test) was computed to find out the significant association between the post-test knowledge score and the monthly income of floor nurses. The finding of F value shows that there is no significant association ( $p>0.05$ ) between post-test knowledge score and monthly income.

Hence, it was interpreted that the monthly income of floor nurses was not associated with the knowledge on PTI in External Fixation. However, the F value was by chance and not true difference. Therefore, the research hypothesis was rejected.

### Summary:

The study was undertaken to assess the effectiveness of Structured teaching Module on on Pin-Tract Infections (PTI) in External Fixation floor nurses. A quantitative approach with quasi-experimental design was used to collect data among 150 floor nurses drawn with non-probability convenient sampling technique using inclusion and exclusion criteria.

### 6. Conclusion

From the findings of present study, it was concluded that the pre-intervention demographic variables of floor 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 floor nurses were significantly increased in experimental group whereas it was remained unchanged in control group. There was a significant difference between pre-test and post-test knowledge scores in experimental group. And, there was also a significant difference between the post-tests of control and experimental group.

Thus, it was concluded that the STM on PTI in external fixation as a method of teaching was effective among floor nurses serving in selected hospitals of Maharashtra state.

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