

EFFECTIVENESS OF SIMULATION-BASED TRAINING ON KNOWLEDGE AND PRACTICE REGARDING PROTOCOL-BASED STEMI MANAGEMENT AMONG STAFF NURSES IN A TERTIARY CARE HOSPITAL OF WESTERN UTTAR PRADESH

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ABSTRACT

Introduction: Cardiovascular diseases remain the leading cause of death worldwide, with ischemic heart disease accounting for the greatest proportion of cardiovascular mortality. According to the Global Burden of Disease 2021 study, approximately 254.3 million people were living with ischemic heart disease globally, resulting in 9.0 million deaths in 2021. Earlier Global Burden of Disease estimates reported 21.2 million new cases of ischemic heart disease worldwide in 2019, highlighting the continuing global burden of coronary artery disease despite advances in prevention and treatment. ST-Elevation Myocardial Infarction (STEMI) is a life-threatening cardiovascular emergency that requires rapid diagnosis and timely intervention. Nurses play a crucial role in the early recognition and management of STEMI. Simulation-based training has emerged as an effective educational strategy for improving clinical competence among healthcare professionals.

Objectives: To assess the effectiveness of simulation-based training on knowledge and practice regarding protocol-based STEMI management among staff nurses.

Methodology: A quasi-experimental pre-test and post-test control group design was adopted. Sixty staff nurses were selected and assigned into experimental (n=30) and control (n=30) groups. Baseline knowledge and practice regarding protocol-based STEMI management were assessed using a structured knowledge questionnaire and observational checklist. The experimental group received simulation-based training, whereas the control group received no intervention. Data were analyzed using appropriate descriptive and inferential statistical methods.

Results: The mean knowledge score of the experimental group increased from 13.53 ± 4.57 in the pre-test to 24.40 ± 3.35 in the post-test. The mean practice score improved from 5.80 ± 2.31 to 10.46 ± 1.99 . Statistically significant differences were observed between pre-test and post-test knowledge and practice scores in the experimental group ($p < 0.001$). A strong positive correlation was found between post-test knowledge and practice scores ($r = 0.882$, $p < 0.001$).

Conclusion: Simulation-based training was highly effective in improving knowledge and practice regarding protocol-based STEMI management among staff nurses. Regular simulation-based educational programs should be incorporated into continuing nursing education to enhance competency in emergency cardiac care.

KEYWORDS: Simulation-based training, STEMI, Myocardial Infarction, Staff Nurses, Knowledge, Practice, Protocol-Based Management.

INTRODUCTION

Cardiovascular diseases remain the leading cause of mortality worldwide and constitute a major public health challenge. Among acute coronary syndromes, ST-Elevation Myocardial Infarction (STEMI) is considered the most severe form because it results from complete coronary artery occlusion, leading to extensive myocardial damage if timely intervention is not provided.

The principle "Time is Muscle" emphasizes the need for rapid diagnosis and immediate initiation of evidence-based treatment. Delays in recognition and treatment contribute significantly to morbidity and mortality. In India, STEMI accounts for a major proportion of acute coronary syndrome cases and frequently affects younger populations compared to Western countries.

Staff nurses play a pivotal role in emergency cardiac care. Their responsibilities include early recognition of symptoms, ECG acquisition and interpretation, administration of emergency medications, activation of STEMI protocols, patient Genetics and Molecular Research 25 (13s): 2026

monitoring, and coordination with multidisciplinary teams. Therefore, enhancing nurses' knowledge and practical skills is essential for improving patient outcomes.

Simulation-based training provides a safe and realistic learning environment that allows healthcare professionals to develop clinical competence, improve decision-making abilities, and strengthen teamwork skills without risking patient safety. Therefore, the present study was undertaken to evaluate the effectiveness of simulation-based training on knowledge and practice regarding protocol-based STEMI management among staff nurses.

OBJECTIVES OF THE STUDY

- To assess the pre-test and post-test level of knowledge regarding Protocol based STEMI management among staff nurses.
- To assess the pre-test and post-test level of practice regarding Protocol based STEMI management among staff nurses.
- To evaluate the effectiveness of simulation-based training program on knowledge and practice regarding Protocol based STEMI management among staff nurses.
- To find the co-relation between level of knowledge and practice regarding Protocol based STEMI management among staff nurses
- To find the association between post-test level of knowledge and practice regarding Protocol based STEMI management among staff nurses and their selected demographic variables.

RESEARCH METHODOLOGY

A quantitative research approach with a quasi-experimental pre-test–post-test control group design was used to assess the effectiveness of simulation-based training on knowledge and practice regarding protocol-based STEMI management among staff nurses. Ethical approval and informed written consent were obtained prior to data collection. The study was conducted among 60 staff nurses working in Emergency and Intensive care units of S.V.B.P Hospital, Meerut, Uttar Pradesh from 05-04-2026 to 10-04-2026. Participants were selected through purposive sampling and divided into experimental (n=30) and control (n=30) groups. Data were collected using a structured knowledge questionnaire and a practice checklist. The experimental group received simulation-based training, while the control group didn't received any intervention during the study period. Data were analyzed using descriptive and inferential statistics.

Data Collection Tools:

Section A – Demographic Data

Section B – Structured Knowledge Questionnaire

Section C – Practice Observation Checklist

Data Analysis:

Descriptive statistics, paired t-test, unpaired t-test, Pearson correlation coefficient, and Chi-square test were used.

RESULTS

Table 4.1: Frequency and Percentage distribution of demographic variables of staff nurses in the Experimental Group and Control Group.

N=60 (Experimental group=30 and Control group=30)

S. No	Demographic Variables	Experimental group		Control group	
		(f)	(%)	(f)	(%)
1	Age (in years)				
	20-30 years	18	60%	22	73.33%
	31-40 years	8	26.67%	0	0.00%
	41-50 years	4	13.33%	8	26.67%
	> 50 years	0	0.00%	0	0.00%
2	Gender				
	Male	4	13.33%	6	20%
	Female	26	86.67%	24	80%
	Other	0	0.00%	0	0.00%
3	Marital status				
	Married	12	40%	8	26.67%
	Unmarried	18	60%	22	73.33%
	Separated	0	0.00%	0	0.00%
	Divorced	0	0.00%	0	0.00%

4	Educational qualification				
	GNM	6	20%	11	36.67%
	B. Sc Nursing	22	73.33%	19	63.33%
	M.Sc Nursing	2	6.67%	0	0.00%
	Others	0	0.00%	0	0.00%
5	Total clinical experience				
	1-3 years	17	56.66%	17	56.66%
	3-6 years	0	0.00%	0	0.00%
	6-10 years	8	26.67%	5	16.67%
	>10 years	5	16.67%	8	26.67%
6	Training on cardiac/MI management				
	Yes	11	36.67%	7	23.33%
	No	19	63.33%	23	76.67%
6.1	If yes, Specify				
	CPR	10	90.91%	6	85.71%
	ACLS	0	0%	0	0%
	ECG interpretation workshop	0	0%	0	0%
	Post PCI management	1	9.09%	1	14.29%

Table 4.1.1- Frequency and Percentage Distribution of Sample according to Age Group.
N=60

S. No	Age Group	Experimental group		Control group	
		(f)	(%)	(f)	(%)
1	20-30 years	18	60%	22	73.33%
2	31-40 years	8	26.67%	0	0.00%
3	41-50 years	4	13.33%	8	26.67%
4	> 50 years	0	0.00%	0	0%
Total		30	100%	30	100%

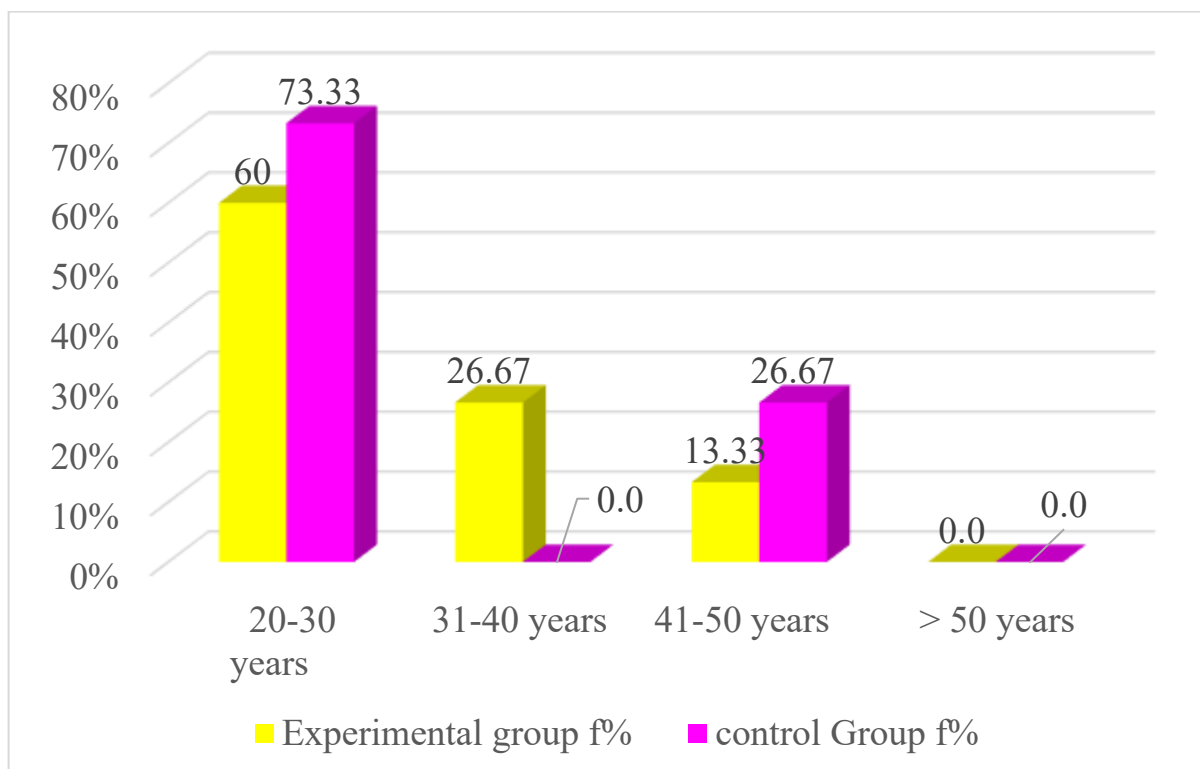


Fig 4.1: Percentage Distribution of Sample according to Age Group

Table 4.1.2- Frequency and Percentage Distribution of Sample according to Gender N=60

S. No	Gender	Experimental group		Control group	
		(f)	(%)	(f)	(%)
1.	Male	4	13.33%	6	20%
2.	Female	26	86.67%	24	80%
3.	Other	0	0.00%	0	0.00%
Total		30	100%	30	100%

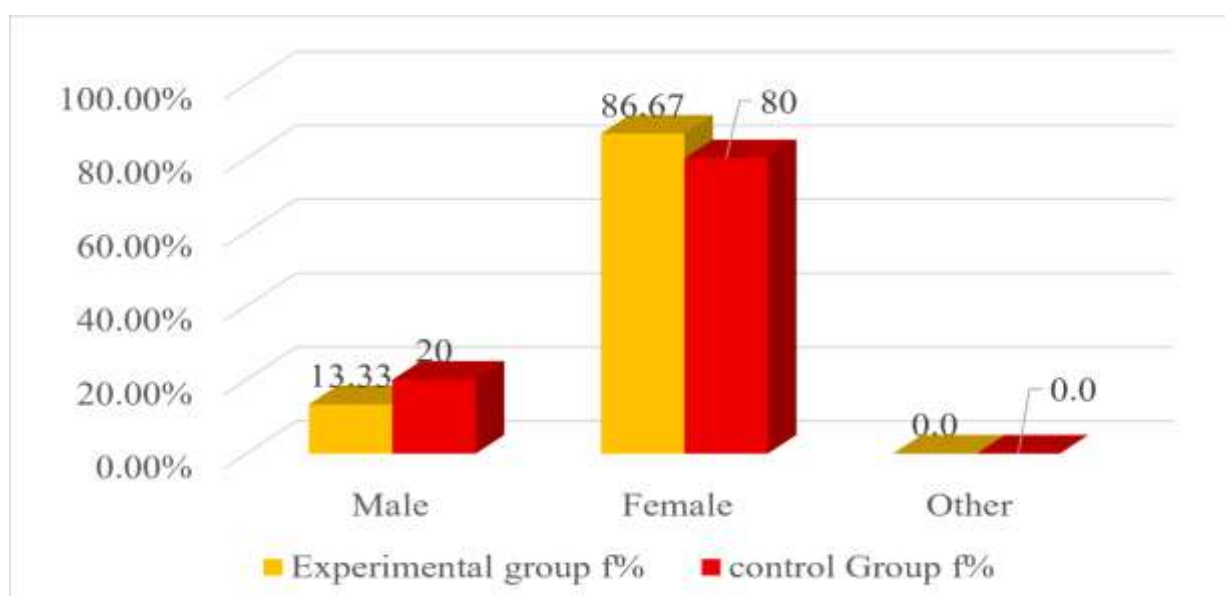


Fig 4.2: Percentage Distribution of Sample according to Gender

Table 4.1.3- Frequency and Percentage Distribution of Sample according to Marital Status. N=60

S. No	Marital Status	Experimental group		Control group	
		(f)	(%)	(f)	(%)

1	Married	12	40%	8	26.67%
2	Unmarried	18	60%	22	73.33%
3	Separated	0	0.00%	0	0.00%
4	Divorced	0	0.00%	0	0.00%
Total		30	100%	30	100%

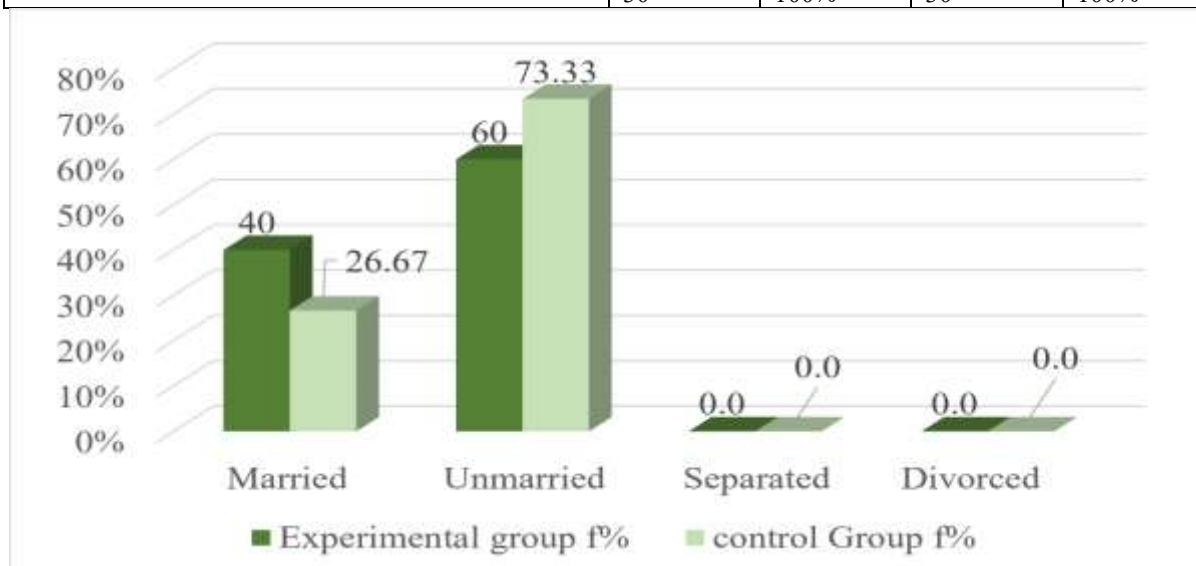


Fig 4.3: Percentage Distribution of Sample according to Marital Status

Table 4.1.4- Frequency and Percentage Distribution of Sample according to Educational qualification N=60

S. No	Educational qualification	Experimental group		Control group	
		(f)	(%)	(f)	(%)
1	GNM	6	20%	11	36.67%
2	B. Sc Nursing	22	73.33%	19	63.33%
3	M.Sc Nursing	2	6.67%	0	0.00%
4	Others	0	0.00%	0	0.00%
Total		30	100%	30	100%

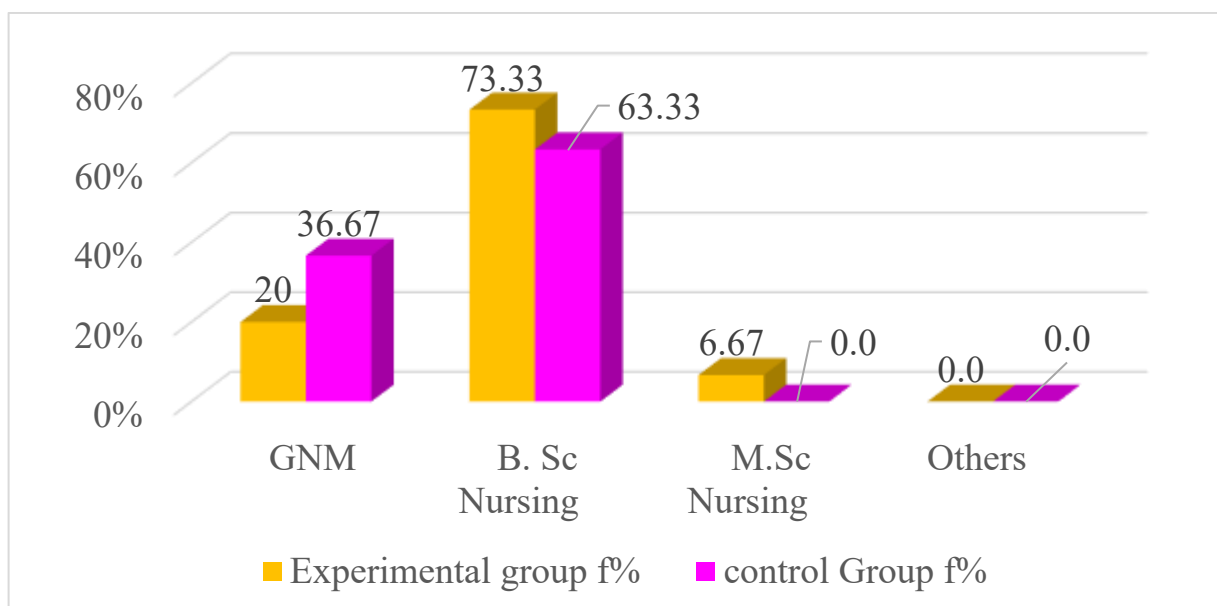
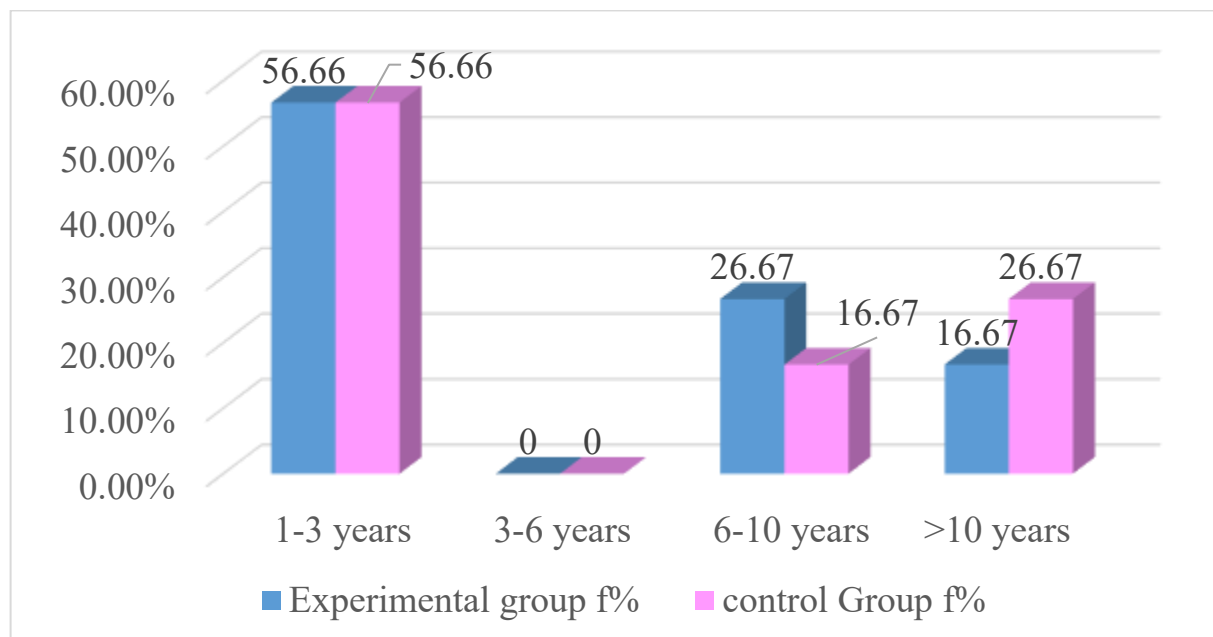


Fig 4.4: Percentage Distribution of Sample according to Educational Qualification

Table 4.1.5- Frequency and Percentage Distribution of Sample according to Total Clinical Experience. N=60

S. No	Total Clinical Experience	Experimental group		Control group	
		(f)	(%)	(f)	(%)
1	1-3 years	17	56.66%	17	56.66%
2	3-6 years	0	0.00%	0	0.00%
3	6-10 years	8	26.67%	5	16.67%
4	>10 years	5	16.67%	8	26.67%
Total		30	100%	30	100%

**Fig 4.5: Percentage Distribution of Sample according to Total Clinical Experience****Table 4.1.6- Frequency and Percentage Distribution of Sample according to Training on cardiac/MI management. N=60**

S. No	Training on cardiac/MI management	Experimental group		Control group	
		(f)	(%)	(f)	(%)
1	Yes	11	36.67%	7	23.33%
2	No	19	63.33%	23	76.67%
Total		30	100%	30	100%
If yes, Specify					
1.1 CPR		10	90.91%	6	85.71%
1.2 ACLS		0	0%	0	0%
1.3 ECG interpretation workshop		0	0%	0	0%
1.4 Post PCI management		1	9.09%	1	14.29%

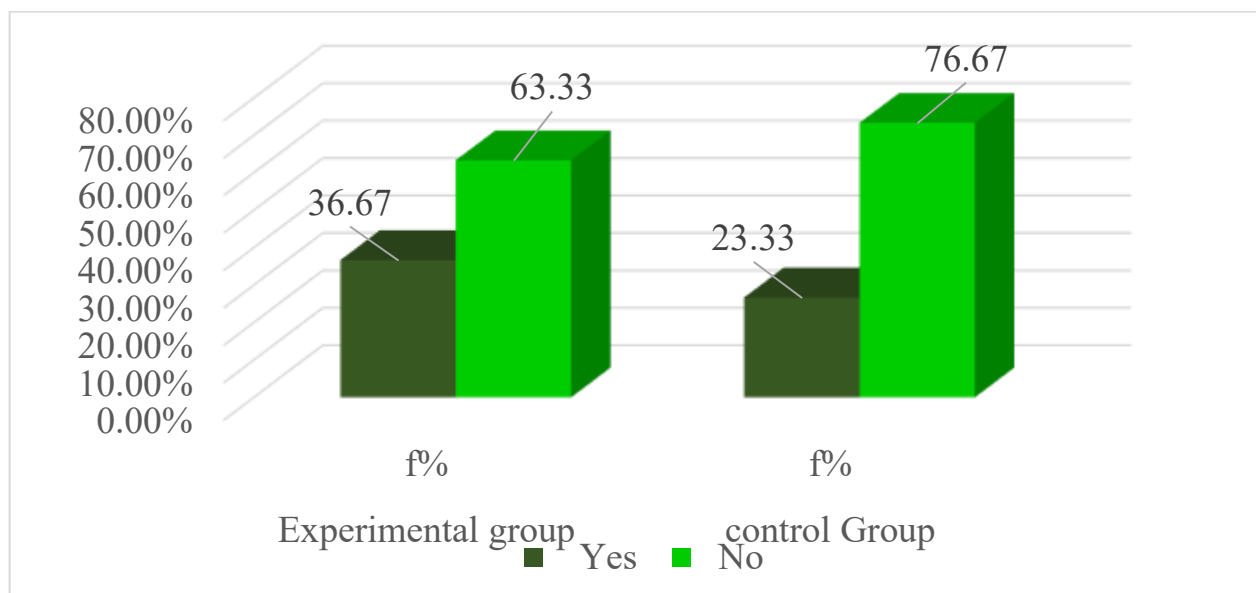


Fig 4.6: Percentage Distribution of Sample according to Training on cardiac/MI management

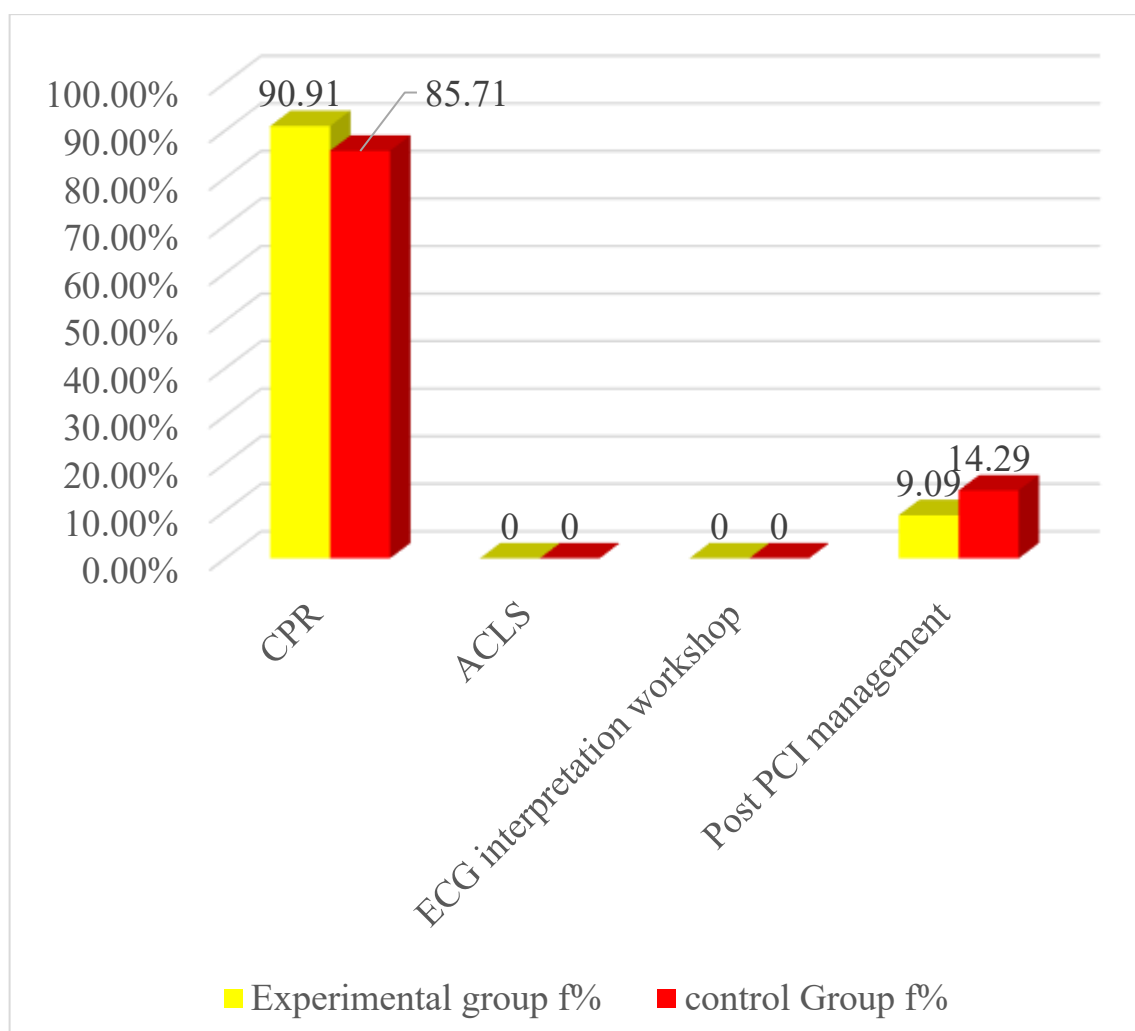


Fig 4.6.1: Percentage Distribution of Sample according Specification of Training on cardiac/MI management

Table 4.2.1: Frequency and percentage distribution Knowledge regarding Protocol based management of STEMI among staff nurses in Experimental group. n=30

S.No	level of knowledge	pretest	Post test
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		f	%	f	%
1	poor	17	56.67%	0	0%
2	adequate	13	43.33%	16	53.33%
3	excellent	0	0%	14	46.67%

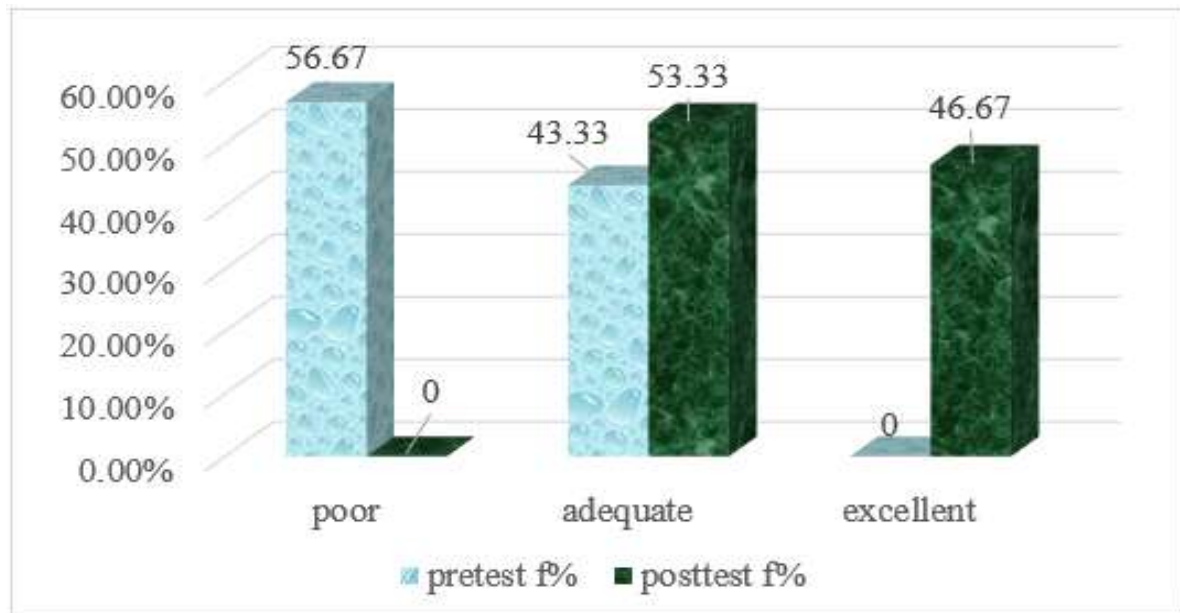


Fig 4.7: Percentage distribution on Knowledge in Experimental group

Table 4.2.2: Frequency and percentage distribution knowledge regarding Protocol based management of STEMI among staff nurses in control group. n=30

S. No	level of knowledge	Pretest		Post test	
		f	%	f	%
1	poor	15	50%	14	46.67%
2	adequate	15	50%	16	53.33%
3	excellent	0	0%	0	0%

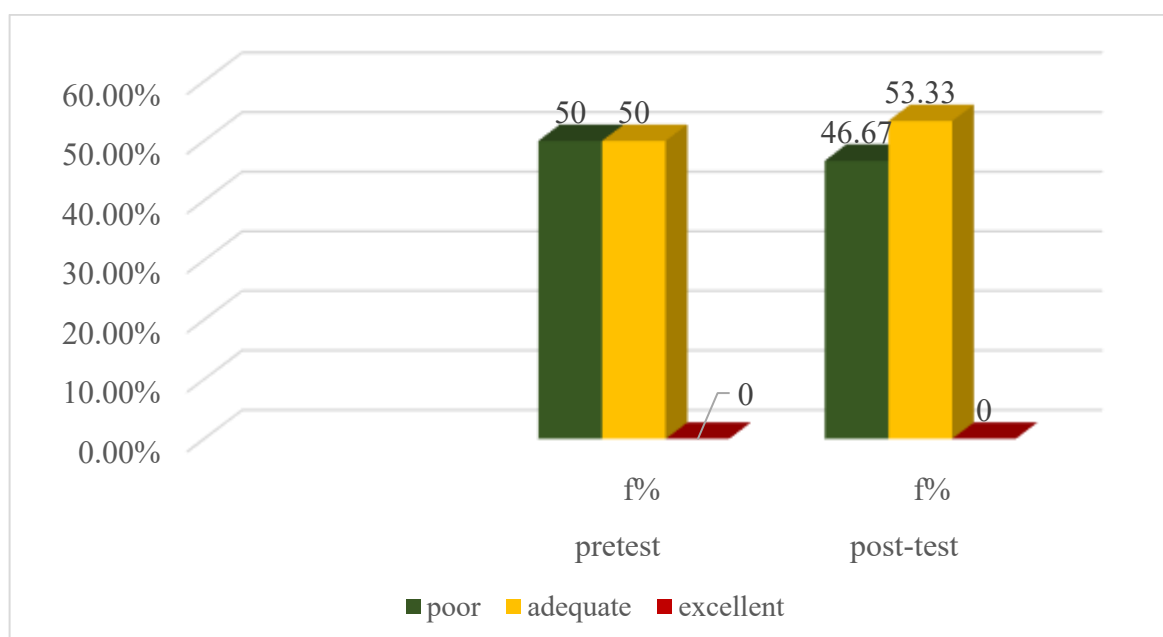


Fig 4.8: Percentage distribution on Knowledge in Control group

Table 4.3.1: Frequency and percentage distribution Practice regarding Protocol based management of STEMI among staff nurses in Experimental group. n=30

S. No	level of practice	Pre test		Post test	
		f	%	f	%
1	poor	13	43.33%	0	0%
2	adequate	15	50.00%	9	30.00%
3	excellent	2	6.67%	21	70.00%

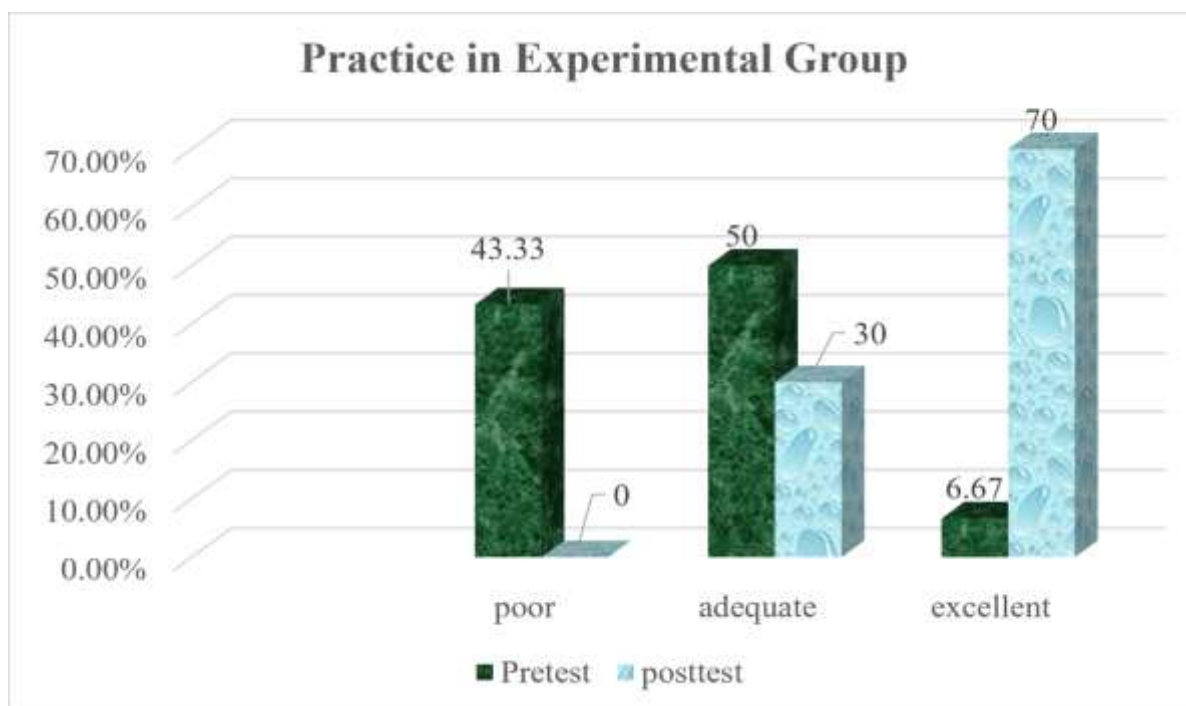


Fig 4.9: Percentage distribution on Practice in Experimental group

Table 4.3.2: Frequency and percentage distribution Practice regarding Protocol based management of STEMI among staff nurses in Control group. n=30

S. No	level of practice	pretest		Post test	
		f	%	f	%
1	poor	13	43.33%	13	43.33%
2	adequate	14	46.67%	15	50.00%
3	excellent	3	10%	2	6.67%

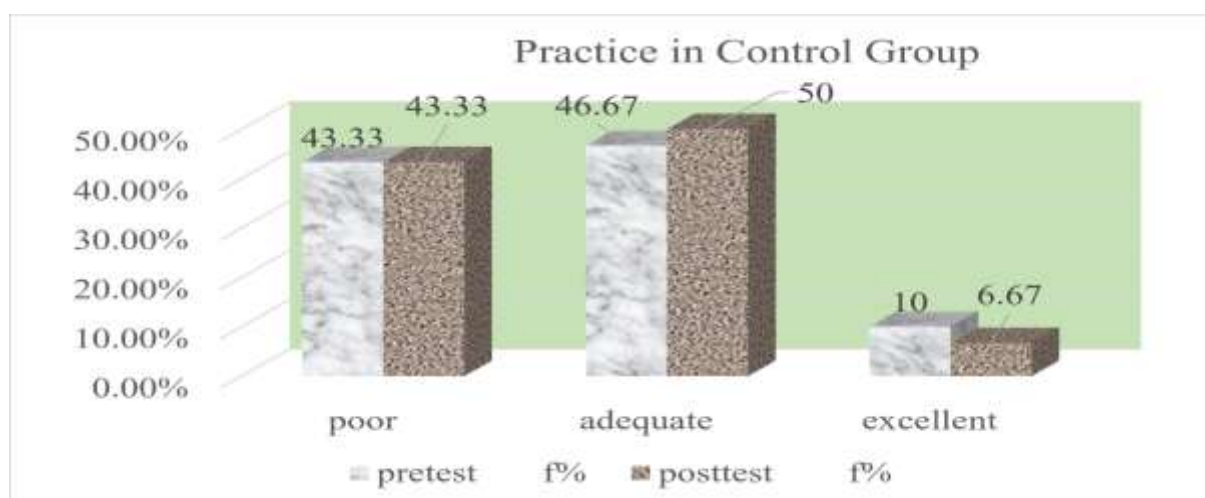


Fig 4.10: Percentage distribution on Practice in Control group

Table 4.4.1: Mean, Standard Deviation, Mean Deviation, and ‘t’ value of Knowledge regarding Protocol based management of STEMI among staff nurses. n=30

management of STEMI among staff nurses. n=50									
S. No	Group		Knowledge						
			MEAN	SD	MD	df	‘t’ value	P value	Remarks
1	Experimental Group	Pre-test	13.53	4.57	10.87	29	14.95	<0.001	S.S
		Post-test	24.4	3.35					
2	Control group	Pre-test	14.06	2.89	0.5		3.34	0.0023	S.S
		Post-test	14.56	3.19					

*p<0.05 level

Table 4.4.2: Mean, Standard Deviation, Mean Deviation, and ‘t’ value of Practice regarding Protocol based management of STEMI among staff nurses. n=30

management of STEMI among staff nurses. n= 30									
S. No	Group		practice						
			MEAN	SD	MD	df	‘t’ value	P value	Remarks
1	Experimental Group	Pre-test	5.8	2.31	4.66	29	17.38	<0.001	S. S
		Post-test	10.46	1.99					
2	Control group	Pre-test	5.4	2.44	0.3		1.87	0.072	N. S
		Post-test	5.7	2.4					

*p<0.05 level

Table 4.4.3: Mean, Standard Deviation, Mean Deviation, and ‘t’ value of Knowledge regarding Protocol based management of STEMI among staff nurses . n=30

S. No	Group	Test	Knowledge						
			MEAN	SD	MD	df	‘t’ value	P value	Remarks
1.	Experimental Group	post-test	24.4	3.35	9.84	58	11.67	<0.001	S.S
2.	Control Group	post-test	14.56	3.19					

Significant at p < 0.05 level

Table 4.4.4: Mean, Standard Deviation, Mean Deviation, and ‘t’ value of Practice regarding Protocol based management of STEMI among staff nurses . n=30

S. No	Group	Test	Practice						
			MEAN	SD	MD	df	‘t’ value	P value	Remarks
1.	Experimental Group	post-test	10.46	1.99	4.76	58	8.12	< 0.001	S. S
2.	Control Group	post-test	5.7	2.4					

Table 4.5.1 To find the co-relation coefficient between post-test Knowledge and Practice regarding Protocol based STEMI management among staff nurses in experimental group.

S. No.	Variable	Mean± SD	Mean difference	r value	P value	Interpretation
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1.	Knowledge	24.4±3.39	13.94	0.88	< 0.001	S. S
2.	Practice	10.46±1.99				

Table 4.5.2 To find the co-relation coefficient between post-test Knowledge and Practice regarding Protocol based STEMI management among staff nurses in control group.

S. No.	Variable	Mean± SD	Mean difference	r value	P value	Interpretation
1.	Knowledge	14.57± 3.19	8.86	0.763	< 0.001	S.S
2.	Practice	5.70 ± 2.40				

Table 4.6.1: Frequency, 'p' value, percentage distribution, and chi square of Knowledge regarding Protocol based management of STEMI among staff nurses in Experimental group (pre-test) n=30

S. No.	Socio-Demographic Variables	Knowledge regarding protocol based management of MI			f	%	df	p' value	χ^2	Level of significance
		poor	adequate	excellent						
1.	Age									
	20-30 years	11	7	0	18	60.00%	2	0.38847	1.8891	N.S
	31-40 years	5	3	0	8	26.67%				
	41-50 years	1	3	0	4	13.33%				
	> 50 years	0	0	0	0	0%				
2.	Gender:									
	Male	2	2	0	4	13.33%	1	0.77256	0.0835	N.S
	Female	15	11	0	26	86.67%				
	Other	0	0	0	0	0%				
3.	Marital status									
	Married	6	6	0	12	40.00%	1	0.5474	0.362	N.S
	Unmarried	11	7	0	18	60.00%				
	Separated	0	0	0	0	0%				
	Divorced	0	0	0	0	0%				
4.	Educational Qualification									
	GNM	6	0	0	6	20.00%	1	0.02624	4.9412	S.S
	B. Sc Nursing	11	11	0	22	73.33%				
	M.Sc Nursing	0	2	0	2	6.67%				
	Others	0	0	0	0	0%				
5.	Total Clinical Experience (in years)									
	1-3 years	11	6	0	17	56.66%	2	0.19244	3.2958	N.S
	3-6 years	0	0	0	0	0%				

	6-10 years	5	3	0	8	26.67%				
	>10 years	1	4	0	5	16.67%				
6.	Training on cardiac/MI management									
	Yes	6	5	0	11	36.67%	1	0.85841	0.318	N.S
	No	11	8	0	19	63.33%				
7.	If yes, Specify									
	CPR	5	5	0						
	ACLS	0	0	0						
	ECG interpretation workshop	0	0	0						
	Post PCI management	1	0	0						

Significant at <0.05 level,
Not significant at >0.05 level

Table 4.6.2: Frequency, 'p' value, percentage distribution, and chi square of Knowledge regarding Protocol based management of STEMI among staff nurses in Control group (pre-test). n=30

S. No.	Socio-Demographic Variables	knowledge regarding protocol based management of MI			f	%	df	'P' value	χ^2	Level of significance at 0.05
		poor	adequate	excellent						
1.	Age									
	20-30 years	7	15	0	22	73.33%	1	0.0009	10.90	S. S
	31-40 years	0	0	0	0	0.00%				
	41-50 years	8	0	0	8	26.67%				
	> 50 years	0	0	0	0	0.00%				
2.	Gender									
	Male	0	6	0	6	20%	1	0.006	7.5	S. S
	Female	15	9	0	24	80%				
	Other	0	0	0	0	0%				
3.	Marital status									
	Married	8	0	0	8	26.67%	1	0.0009	10.90	S. S
	Unmarried	7	15	0	22	73.33%				
	Separated	0	0	0	0	0%				
	Divorced	0	0	0	0	0%				
4.	Educational Qualification									
	GNM	8	3	0	11	36.67%	1	0.058	3.5	N.S
	B. Sc Nursing	7	12	0	19	63.33%				

	M.Sc Nursing	0	0	0	0	0%				
	Others	0	0	0	0	0%				
5.	Total Clinical Experience (in years)						2	0.0035	11.27	S.S
	1-3 years	6	11	0	17	56.66%				
	3-6 years	0	0	0	0	0%				
	6-10 years	1	4	0	5	16.67%				
	>10 years	8	0	0	8	26.67%				
6.	Training on cardiac/MI management						1	0.030	4.65	S.S
	Yes	6	1	0	7	23.33%				
	No	9	14	0	23	76.67%				
7.	If yes, Specify									
	CPR	5	1	0						
	ACLS	0	0	0						
	ECG interpretation workshop	0	0	0						
	Post management PCI	1	0	0						

Significant at <0.05 level,

Table 4.6.3: Frequency, 'p' value, percentage distribution, and chi square of Practice regarding Protocol based management of STEMI among staff nurses in Experimental group (pre-test) n=30

S.No.	Socio-Demographic Variables	practice regarding protocol based management of MI			f	%	df	p' value	χ^2	Level of significance
		poor	adequate	excellent						
1.	Age						4	0.18893	6.14	N.S
	20-30 years	7	11	0	18	60.00%				
	31-40 years	5	2	1	8	26.67%				
	41-50 years	1	2	1	4	13.33%				
	> 50 years	0	0	0	0	0%				
2.	Gender						2	0.2612	2.6849	N.S
	Male	1	2	1	4	13.33%				
	Female	12	13	1	26	86.67%				
	Other	0	0	0	0	0%				
3.	Marital status						2	0.11554	4.3162	N.S
	Married	6	4	2	12	40.00%				
	Unmarried	7	11	0	18	60%				
	Separated	0	0	0	0	0%				
	Divorced	0	0	0	0	0%				

4.	Educational Qualification									
	GNM	6	0	0	6	20.00%	4	0.00303	15.986	S.S
	B.Sc Nursing	7	14	1	22	73.33%				
	M.Sc Nursing	0	1	1	2	6.67%				
	Others	0	0	0	0	0%				
5.	Total Clinical Experience (in years)									
	1-3 years	7	10	0	17	56.66%	4	0.23412	5.5644	N.S
	3-6 years	0	0	0	0	0%				
	6-10 years	5	2	1	8	26.67%				
	>10 years	1	3	1	5	16.67%				
6.	Training on cardiac/MI management									
	Yes	3	6	2	11	36.67%	2	0.10227	4.5602	N.S
	No	10	9	0	19	63.33%				
7.	If yes, Specify									
	CPR	3	5	2						
	ACLS	0	1	0						
	ECG interpretation workshop	0	0	0						
	Post PCI management	0	0	0						

Significant at <0.05 level,
Not significant at >0.05 level

Table 4.6.4: Frequency, 'p' value, percentage distribution, and chi square of Practice regarding Protocol based management of STEMI among staff nurses in Control group (pre-test) n=30

S.No.	Socio-Demographic Variables	Practice regarding protocol based management of MI			f	%	df	P value	χ^2	Level of significance
		poor	adequate	excellent						
1.	Age									
	20-30 years	6	13	3	22	73.33%	2	0.0127	8.7306	S.A
	31-40 years	0	0	0	0	0%				
	41-50 years	7	1	0	8	26.67%				
	> 50 years	0	0	0	0	0%				
2.	Gender:									
	Male	0	6	0	6	13.33%	2	0.01376	8.5714	S.S
	Female	13	8	3	24	86.67%				
	Other	0	0	0	0	0%				
3.	Marital status									

	Married	7	1	0	8	26.67%	2	0.01271	8.7306	S.S
	Unmarried	6	13	3	22	73.33%				
	Separated	0	0	0	0	0%				
	Divorced	0	0	0	0	0%				
4.	Educational Qualification						2	0.21584	3.0664	N.S
	GNM	7	3	1	11	36.67%				
	B. Sc Nursing	6	11	2	19	63.33%				
	M.Sc Nursing	0	0	0	0	0%				
	Others	0	0	0	0	0%				
5.	Total Clinical Experience (in years)						4	0.00791	13.815	S.S
	1-3 years	5	11	1	17	56.66%				
	3-6 years	0	0	0	0	0%				
	6-10 years	1	2	2	5	16.67%				
	>10 years	7	1	0	8	26.67%				
6.	Training on cardiac/MI management						2	0.14353	3.8823	N.S
	Yes	5	1	1	7	23.33%				
	No	8	13	2	23	76.67%				
7.	If yes, Specify									
	CPR	4	1	0						
	ACLS	0	0	1						
	ECG interpretation workshop	0	0	0						
	Post PCI management	1	0	0						

RESULT

The findings revealed a significant improvement in both knowledge and practice regarding protocol-based STEMI management among staff nurses who received simulation-based training. In the experimental group, the mean knowledge score increased from 13.53 ± 4.57 in the pre-test to 24.40 ± 3.35 in the post-test, demonstrating a statistically significant improvement ($p < 0.001$). In contrast, the control group showed only a marginal increase in knowledge scores from 14.06 ± 2.89 to 14.56 ± 3.19 . Similarly, the mean practice score in the experimental group improved significantly from 5.80 ± 2.31 during the pre-test to 10.46 ± 1.99 during the post-test ($p < 0.001$), whereas the control group exhibited negligible improvement, with scores increasing from 5.40 ± 2.44 to 5.70 ± 2.40 . Comparison of post-test scores revealed that the experimental group had significantly higher knowledge scores (24.40 ± 3.35) than the control group (14.56 ± 3.19), with a mean difference of 9.84 ($t = 11.67$, $p < 0.001$). Likewise, the post-test practice scores were significantly higher in the experimental group (10.46 ± 1.99) compared to the control group (5.70 ± 2.40), with a mean difference of 4.76 ($t = 8.12$, $p < 0.001$). Furthermore, a strong positive correlation was observed between post-test knowledge and practice scores among staff nurses in the experimental group ($r = 0.88$, $p < 0.001$), indicating that enhanced knowledge was associated with improved clinical practice.

DISCUSSION

The findings of the study demonstrated that simulation-based training significantly improved both knowledge and practice regarding protocol-based STEMI management among staff nurses. The substantial increase in post-test scores suggests that simulation-based educational interventions effectively enhance understanding of STEMI management principles and improve practical competency.

The findings support previous research indicating that simulation-based learning enhances clinical decision-making, emergency preparedness, critical thinking, and adherence to evidence-based protocols. The strong positive correlation between knowledge and practice further suggests that improvement in theoretical understanding directly contributes to enhanced clinical performance.

NURSING IMPLICATIONS

Nursing Practice:

Simulation-based training can improve emergency cardiac care and reduce delays in STEMI management.

Nursing Education:

Incorporation of simulation-based learning into nursing curricula can strengthen clinical competence.

Nursing Administration:

Hospital administrators should encourage regular competency-based training programs for staff nurses.

Nursing Research:

Further studies with larger sample sizes and multiple settings are recommended.

RECOMMENDATIONS

- Similar studies may be conducted on a larger sample to improve generalizability.
- Simulation-based training should be incorporated into regular in-service education programmes for staff nurses.
- Periodic training and competency assessments on protocol-based STEMI management should be conducted.

LIMITATIONS

- The study was limited to single tertiary care hospital.
- Sample size was relatively small.
- Follow-up assessment was not conducted.
- Findings cannot be generalized to all healthcare settings.

CONCLUSION

The study concluded that Simulation-based training was highly effective in improving knowledge and practice regarding protocol-based STEMI management among staff nurses. Significant improvements were observed in both knowledge and practice scores among staff nurses who received the Simulation based training. The findings support the integration of simulation-based educational programs into continuing nursing education to enhance nurses' competency and improve patient outcomes in emergency cardiac care.

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