"A Study to Assess the Effectiveness of Simulation on Cardiac Defibrillation Practices among Nurses Working In Critical Care Area."

Mrs: Archana Pardeshi

Assistant Professor, Phd Scholar
Dr.D.Y Patil University, Pimpri,Pune-18
Corresponding Author Mrs: Archana Pardeshi

Abstract

Background: *Cardiovascular diseases have now become the leading cause of mortality in India. A quarter of all mortality is attributable to CVD. The Global Burden of Disease study estimate of age-standardized CVD death rate of 272 per 100 000 population in India is higher than the global average of 235 per 100 000 population.Defibrillation is a common treatment for life-threatening cardiac arrhythmias, ventricular fibrillation and pulse less ventricular tachycardia. Defibrillation consists of delivering a therapeutic dose of electrical energy to the affected heart with a device called a defibrillator. Despite the extension of training and the authorization of nurses to perform early defibrillation advocated by the American Heart Association, such practice has not been widely adopted in hospitals. Inadequate knowledge, lack of skill retention, insufficient organizational support and the passive culture of nurses are barriers preventing the move towards nurse-led defibrillation.*

Objectives of the study *: To assess the ractice score of critical care nurses regarding defibrillation technique before and after simulation. To determine the association between practice score of critical care nurses with selected demographic variable.*

Material and method *: Research approach : Quantitative research approach Research Design: Pre experimental One group Pre-test Post-test design. Settings : study was conducted in Dr.D.YPatilHospital & Research Center Population: Critical care nurses working in ICU of Dr. D.Y Patil Hospital & Research Center. Sample and sample size : 50 Sampling technique : Purposive sampling technique.Tool: socio demographic data and rating scale .Reliability : Reliability was assessed using an inter-rater method. Cohen's kappa measures the agreement between two raters .Cohen's Kappa was found to be 0.90. **Results**: Practices of critical care nurses regarding defibrillation technique before and after simulation In pretest, 66% of the critical care nurses had poor practices (Score0-14) and 34% of them had average practices (Score 15-28) regarding defibrillation technique.Inposttest, all of them had good practices (Score 29-42) regarding defibrillation technique. This indicates that the practices of critical care nurses improved remarkably after simulation.Researcher applied paired t-test for testing the effectiveness of simulation on practices among critical care nurses regarding defibrillation technique. .Reliability : Reliability was assessed using an inter-rater method. Cohen's kappa measures the agreement between two raters .Cohen's Kappa was found to be 0.90.. The total reliability of the tool was calculated to be 0.90by Cohen's Kappa method. Kappa value interpretation is 0.90, which shows perfect and the tool is reliable.Data collection : Data was collected from 50 Critical care Nurses of selected Intensive Care units.Data analysis : The data collected was analysed using descriptive and inferential statistics.Average practices score in pretest was 7.4which increased to 41.6 in posttest. T-value for this test was 42.7 with 49 degrees of freedom. Corresponding p-value was small (less than 0.05), the null hypothesis was rejected. It is evident that the simulation is significantly effective in improving the practices among critical care nurses regarding defibrillation technique. Since all the p-values are large (greater than 0.05), none of the demographic variables were found to have significant association with practices of critical care nurses with selected demographic variable.*

Conclusion: *Theresults of pre test of the study reveal that there is low level ofpractice scores about the defibrillationtechnique. In post test significant gain in practice scores were seen. The results indicated goodpositive response to the Simulation teaching.It was found to be really useful to them. The subjectsexpressed that they were expecting more of such kind ofinformation programs with pictures, videos, demonstrationand planned teaching.*

Keywords: *Simulation, defibrillation, Practices ,critical care nurses*

I. Introduction:

It has been documented that33% to 40% of cardiac arrests in developed countries occur in the hospital setting, and of the arrests that occur in the hospital setting more than 60% are first recognized by nurses. Earlier defibrillation has significantly improved the survival of the victims who suffer from an out-of-hospital cardiac arrest.. The advantages of AED have also extended its application in the hospital setting. To shorten time to first shock within three minutes of collapse, the American Heart Association has recommended use of AED, especially by nurses who are most likely to be the first responding to a cardiac arrest in the hospital.It is necessary for nurses to know more regarding defibrillations and the need to extend the registered nurses' role in the early defibrillation of cardiac patients. Current nursing practice in emergency resuscitation care and the hurdles constraining early defibrillation. The successful extension of the registered nurses' role in early defibrillation will enable them to possess broader knowledge to be clinically competent in providing efficient patient care.

RESEARCH METHODOLOGY
- Research approach : Quantitative research approach
- Research Design : Pre experimental One group Pre-test Post-test design.
- Settings : study was conducted in Dr.D.YPatil Hospital & Research Center
- Population: Critical care nurses working in ICUof Dr.D.Y Patil Hospital & Research Center.
- Sample and sample size : 50
- Sampling technique :Purposive sampling technique.

Tool: socio demographic data and rating scale .

MAJOR FINDINGS OF THE STUDY
SECTION I : FINDINGS RELATED TO DEMOGRAPHIC
CHARACTERISTICS OF THE SUBJECTS
Description of samples (critical care nurses) based on their personal characteristics in terms of frequency and percentages.

94% of the critical care nurses had age 20-24 years and 6% of them had age 25-29 years. 34% of them were males and 66% of them were females. 68% of them were Hindu, 22% of them were Muslim and 10% of them had other religion. 2% of them were GNM and 98% of them had Post certificate. 82% of them had 0-1 years of working and 18% of them had 2-3 years of work experience. 28% of them were working in MICU, 32% of them were working in SICU, 20% of them were working in CVT ICU and 20% of them were working in RICU. All of them knew what AED is. None had ever followed a basic workshop of AED.

None of them had been trained in basic use of AED.

None of them were aware of the Guideline of Defibrillation.

SECTION II
Analysis of data related to the practices of critical care nurses regarding defibrillationtechnique before and after simulation.

Practices of critical care nurses regarding defibrillation technique before and after simulation In pretest, 66% of the critical care nurses had poor practices (Score 0-14) and 34% of them had average practices (Score 15-28) regarding defibrillation technique. In posttest, all of them had good practices (Score 29-42) regarding defibrillation technique. This indicates that the practices of critical care nurses improved remarkably after simulation.

Researcher applied paired t-test for testing the effectiveness of simulation on practices among critical care nurses regarding defibrillation technique. Average practices score in pretest was 7.4 which increased to 41.6 in posttest. T-value for this test was 42.7 with 49 degrees of freedom. Corresponding p-value was small (less than 0.05), the null hypothesis was rejected. It is evident that the simulation is significantly effective in improving the practices among critical care nurses regarding defibrillation technique

Analysis of data related to the association between practices of critical care nurses with selected demographic variable Fisher's exact test for association between practices of critical care nurses with selected demographic variable.

Since all the p-values are large (greater than 0.05), none of the demographic variables were found to have significant association with practices of critical care nurses with selected demographic variable.

IMPLICATIONS OF THE STUDY
The findings of the study have implications for nursing practice, nursing education, and nursing research

NURSING PRACTICE. –

Nursing Implications
The findings of this study have implications for nursing practice, nursing education, nursing administration and nursing research.

Nursing Practice
* Nursing personnel working in the hospital as well as in the community can understand the importance of demonstration regarding defibrillation.
* Nurses play a key role in educating the staff nurses on defibrillation by organizing demonstration and teaching sessions and by individual educational programs.
* Nurses have to develop instructional or demonstration module to educate staff nurses.
* The use of demonstration and planned teaching information material for staff nurses to supplement verbal information, increase knowledge and practice and satisfaction among the staff nurses.

Nursing Education
This study emphasis on the enhancement of the knowledge and practices of staff nurses regarding defibrillation to prevent death among cardiac arrest patients.
* Nurse educator has to pay more attention on training of staff nurses regarding defibrillation. So that they can impart appropriate knowledge to other staff nurses group
* More emphasis has to be placed in the regular and periodical teaching or demonstration sessions on prompt and proper technical aspects of defibrillation.
* Student Nurses can be motivated to organize demonstration and teaching programs to enhance the knowledge and practice of student nurses regarding defibrillation.
* Education is the key to the development of excellent nursing practice. With changing health care trend, nursing education must emphasize primary health care approach focusing on survival of in- hospital cardiac arrest victims rather than waiting for medical help. As the needs of society as well as profession are continuously changing latest components must be incorporated in the nursing curriculum. Nursing education must emphasize on education of staff nurses regarding defibrillation to improve their confidence.
* The education curriculum must include imparting knowledge of defibrillation. The education curriculum must include imparting the knowledge about the use of various audio visual aids and teaching strategies. □ Nursing teachers can use the result of the study as an informative illustration for the students. Nursing education should help in inculcating values and a sense of responsibilities in the students to educate nurses regarding defibrillation.

Nursing Administration
* Nurse administrative should plan and organize training programme for the staff nurses on defibrillation.
* Nurse administrator has to organize educational programs in the general wards, intensive care units, emergency departments and community settings.
* Nurse administrator can develop hospital policy for motivating their staff nurses for in service education.
* Necessary administrative support has to be provided to conduct inservice education, workshops in hospitals, and educational institutes with appropriate A.V Aids, mass media, posters and role plays, drama and puppet show.

The nurse administrators have a responsibility to provide staff nurses with substantive continuing education opportunities. This will enable to update the knowledge, acquire special skills and enable to act promptly

NURSING RESEARCH-
Nursing research is an essential aspect of nursing as it uplifts the profession and develops new nursing norms and body of knowledge. Here, another research has been added to the nursing literature. Very few studies have been done on a similar basis. The research design, findings and the tool can be used as avenues for further research. A similar study can be conducted on large scale and in various settings. An in depth study on the advanced aspects of defibrillation can be conducted. The finding of the study shows that majority of the staff nurses lack in knowledge and practices about defibrillation. Based on the findings the professional and student nurses can conduct further studies on various aspects of defibrillation and its importance and impacts on health, community and surroundings in order to assess the knowledge of staff nurses. The study will motivate the beginning researchers to conduct similar study in large scale and on a comparative basis it also motivates young

and enthusiastic researchers to implement demonstration and teaching programme activities and see its effectiveness

Conclusion

Present study focuses on the practices of staff nurses in relation to defibrillation technique. During the study it was observed that, all the subjects were very enthusiastic and interested to learn. one group pre test post test design was used to assess the effect of simulated demonstration. The results of pre test of the study reveal that there is low level of practice scores about the defibrillation technique. In post test significant gain in practice scores were seen. The results indicated good positive response to the Simulation teaching. It was found to be really useful to them. The subjects expressed that they were expecting more of such kind of information programs with pictures, videos, demonstration and planned teaching.

Limitations
1.No standardized tools were available therefore the investigator prepared a tool for the purpose of the study.
3. The study was confined to a small number of subjects which limits the generalization of the study.
4. The study did not use any control group.

RECOMMENDATIONS
Keeping in view the findings of the study, following recommendations are made :
1.   A similar study can be conducted on a large sample for generalizations
2.   A comparative study can be done to assess the practices regarding Defibrillation between critical care nurses residing in urban and rural areas.
3.   A similar study can be conducted with different teaching strategies such as SIM.(self instructional module) ,video assisted teaching .

CHAPTER IV
ANALYSIS AND INTERPRETATION OF DATA
Polit and Beck (2008) defines statistical analysis as the "organization and analysis of quantitative data using statistical procedures, including both descriptive and inferential statistics." The purpose of the analysis is to reduce a data to an intelligible and interpretable form so that the relation of research problem can be studied and tested.
This chapter deals with the analysis and interpretation of the data collected from 30 subjects who are school students from selected schools of city.

The data was analyzed according to the objectives of the study which was:
1)   To assess the practice score of critical care nurses regarding defibrillation technique before and after simulation.
2)   To determine the association between practice score of critical care nurses with selected demographic variable.
The analysis of the collected data was done with the help of inferential and descriptive statistics. The data collected was first coded and entered into the computer. The gathered data was organized, tabulated, analyzed and interpreted on the basis of the objectives and hypothesis of the study.

ORGANIZATION OF FINDINGS:
The collected data was tabulated, analyzed and organized under the following headings:
SECTION I:
Distribution of subjects based on demographic characteristics.
SECTION II :
Analysis of level of practice score of   critical care nurses regarding defibrillation technique before and after simulation.
SECTION III:
Analysis of association between practice   score of subjects with selected demographic variables.
SECTION I : DISTRIBUTION OF SUBJECTS IN RELATION TO DEMOGRAPHIC CHARACTERISTICS.
This section deals with the distribution of subjects based on to selected demographic characteristics such as age, Religian ,gender, education, work experience ,area of work , workshop attended on Defibrilation , any training in AED and Aware of Guideline of Defibrilation.

TABLE 4.1: Distribution of subjects from selected Intensive care units in relation to demographic characteristics

SECTION I
Description of samples (critical care nurses) based on their personal characteristics
Table 1: Description of samples (critical care nurses) based on their personal characteristics in terms of frequency and percentages
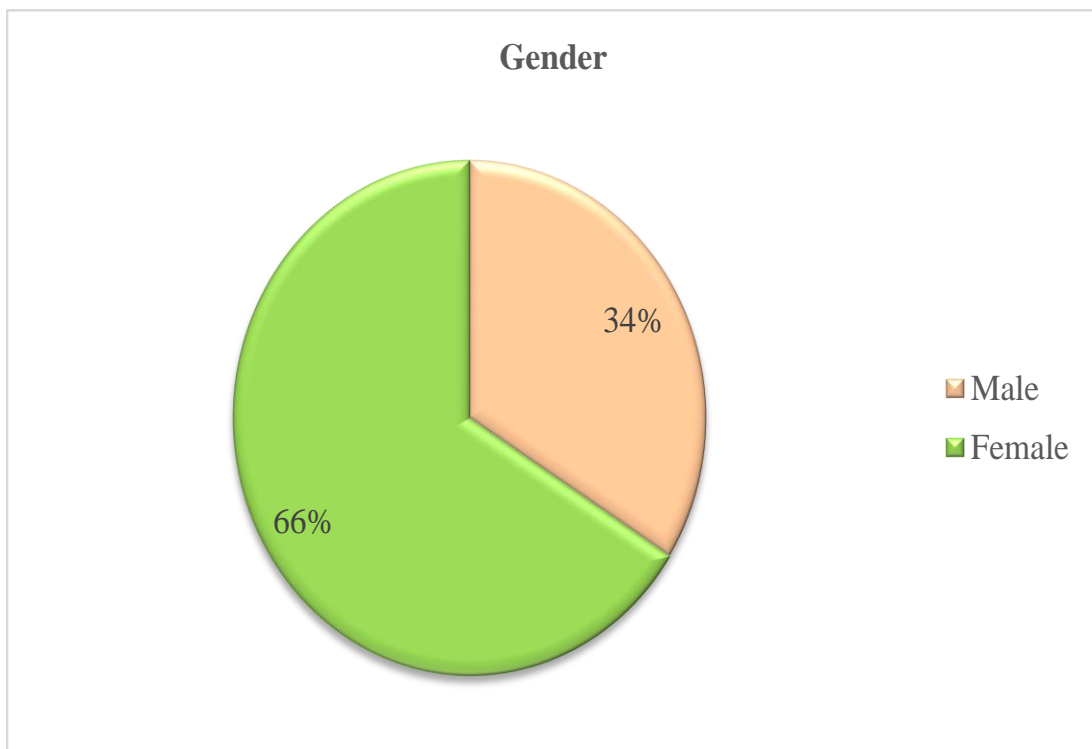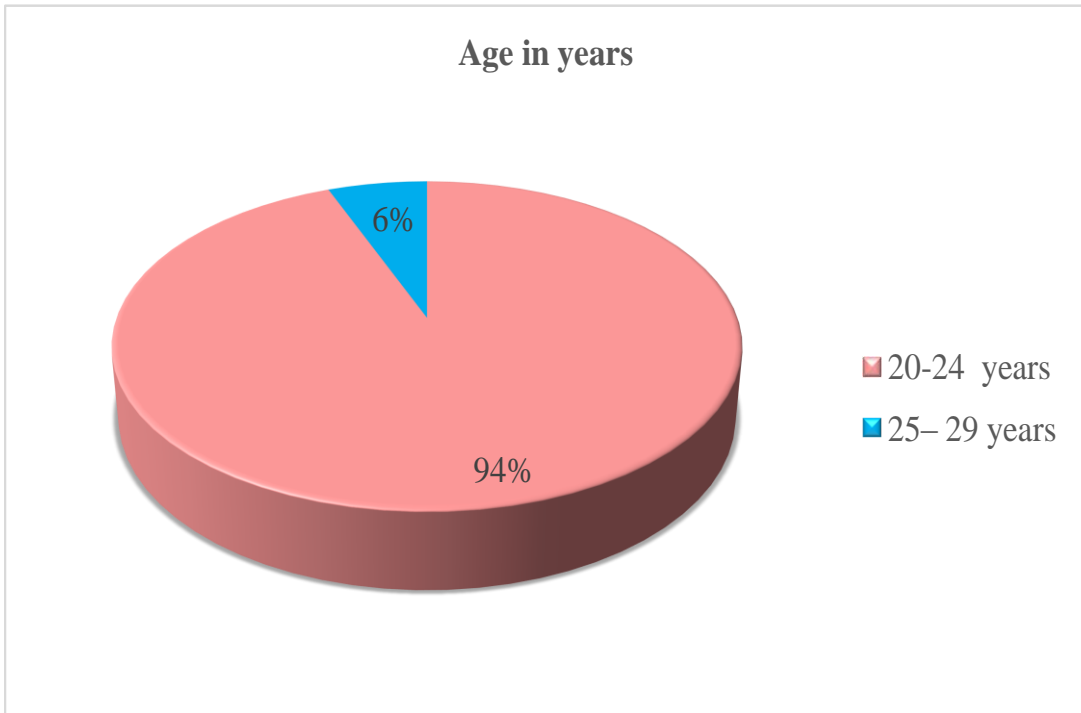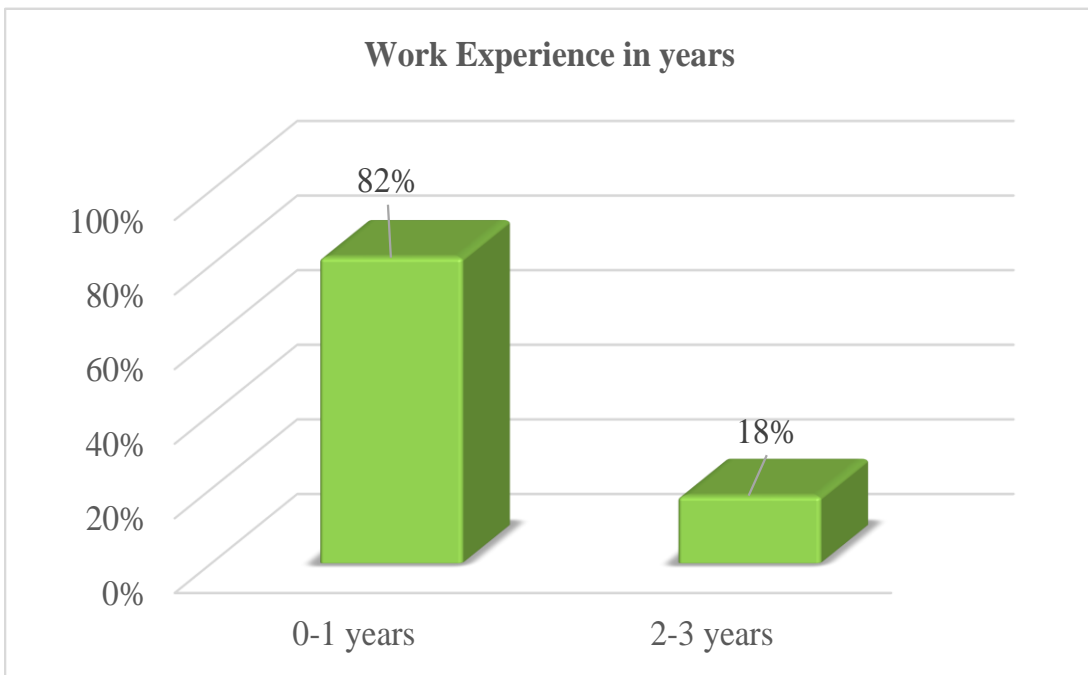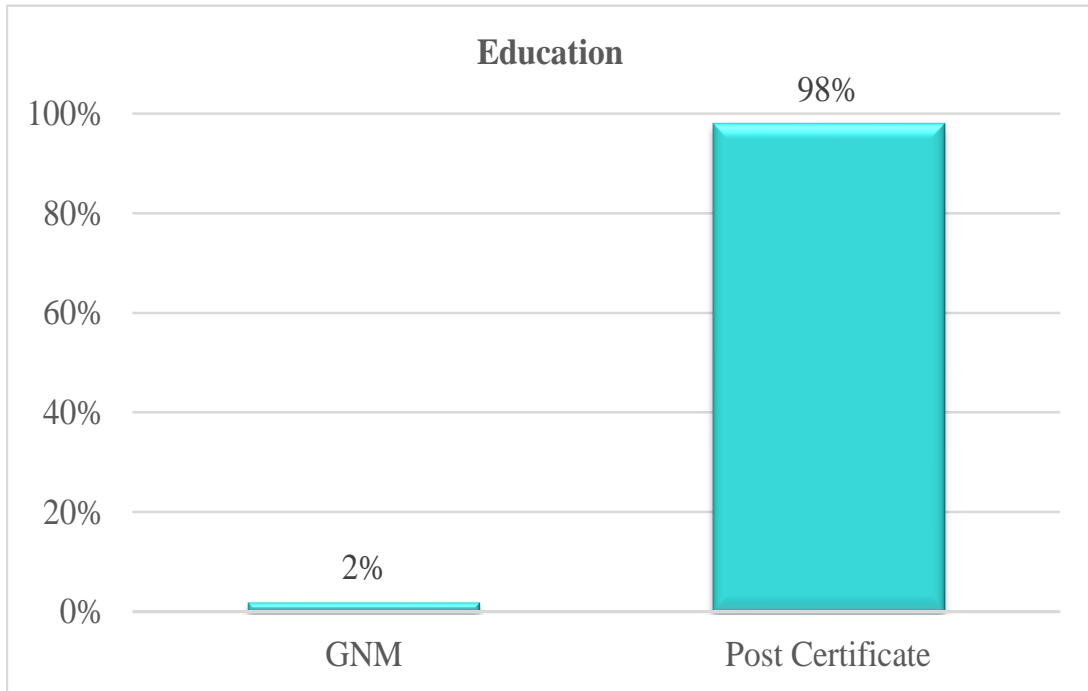
N=50

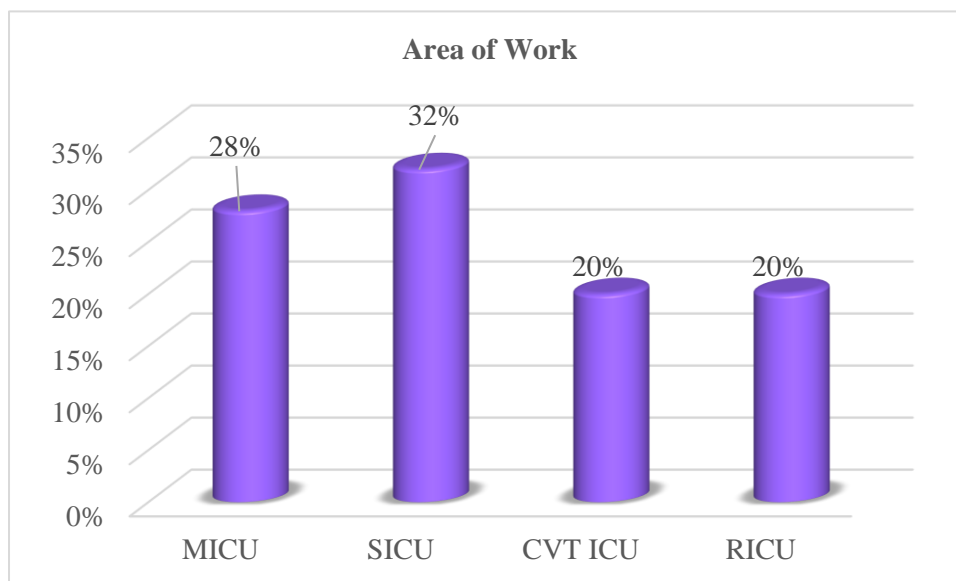| Demographic variable	Freq	%
Age in years		
20-24 years	47	94%
25– 29 years	3	6%
Gender		
Male	17	34%
Female	33	66%
Religion		
Hindu	34	68%
Christian	11	22%
Other	5	10%
Education		
GNM	1	2%
Post Certificate	49	98%
Work Experience in years		
0-1 years	41	82%
2-3 years	9	18%
Area of Work		
MICU	14	28%
SICU	16	32%
CVT ICU	10	20%
RICU	10	20%
Do you know what an AED Is		
Yes	50	100%
Have you ever followed a basic workshop of AED		
No	50	100%
How many times have you been trained in basic use of AED		
Never	50	100%
Are you aware of the Guideline of Defibrillation		
No	50	100%

94% of the critical care nurses had age 20-24 years and 6% of them had age 25-29 years. 34% of them were males and 66% of them were females. 68% of them were Hindu, 22% of them were Muslim and 10% of them had other religion. 2% of them were GNM and 98% of them had Post certificate. 82% of them had 0-1 years of working and 18% of them had 2-3 years of work experience. 28% of them were working in MICU, 32% of them were working in SICU, 20% of them were working in CVT ICU and 20% of them were working in RICU. All of them knew what AED is. None had ever followed a basic workshop of AED.
None of them had been trained in basic use of AED.
None of them were aware of the Guideline of Defibrillation.

Age in years

Gender

Education

Work Experience in years

Area of Work

SECTION II
Analysis of data related to the practices of critical care nurses regarding defibrillation technique before and after simulation.

Table 2: Practices of critical care nurses regarding defibrillation technique before and after simulation

N=50

Practices	Pretest		Posttest	
	Freq	%	Freq	%
Poor (Score 0-14)	33	66%	0	0%
Average (score 15-28)	17	34%	0	0%
Good (score 29-42)	0	0%	50	100%

In pretest, 66% of the critical care nurses had poor practices (Score 0-14) and 34% of them had average practices (Score 15-28) regarding defibrillation technique. In posttest, all of them had good practices (Score 29-42) regarding defibrillation technique. This indicates that the practices of critical care nurses improved remarkably after simulation.
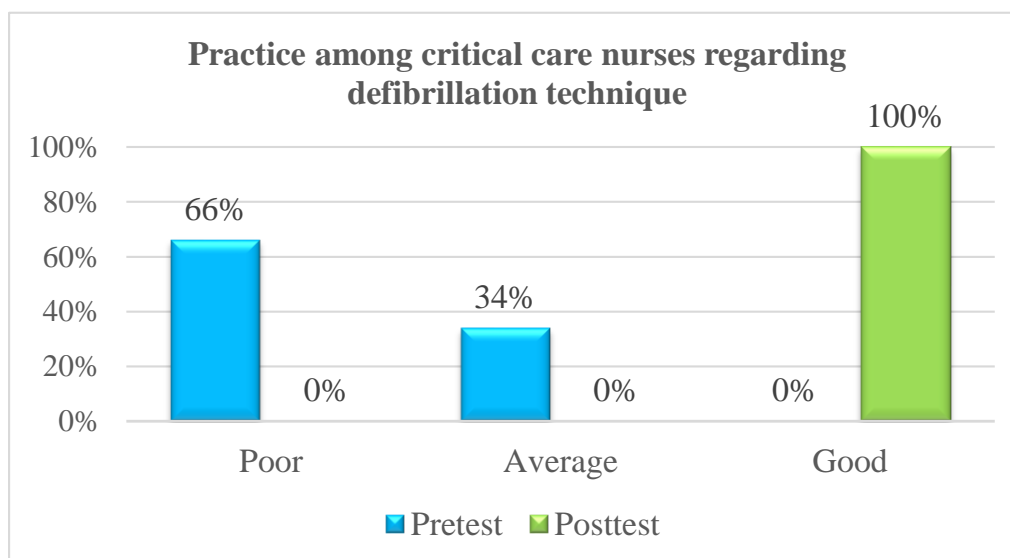
Table 3: Paired test for effectiveness of simulation on practices among critical care nurses regarding defibrillation technique

N=50

	Mean	SD	t	df	p-value
Pretest	7.4	5.7	42.7	49	0.000
Posttest	41.6	0.5			

Researcher applied paired t-test for testing the effectiveness of simulation on practices among critical care nurses regarding defibrillation technique. Average practices score in pretest was 7.4 which increased to 41.6 in posttest. T-value for this test was 42.7 with 49 degrees of freedom. Corresponding p-value was small (less than 0.05), the null hypothesis was rejected. It is evident that the simulation is significantly effective in improving the practices among critical care nurses regarding defibrillation technique.

Average pretest and posttest practice score among critical care nurses regarding defibrillation technique
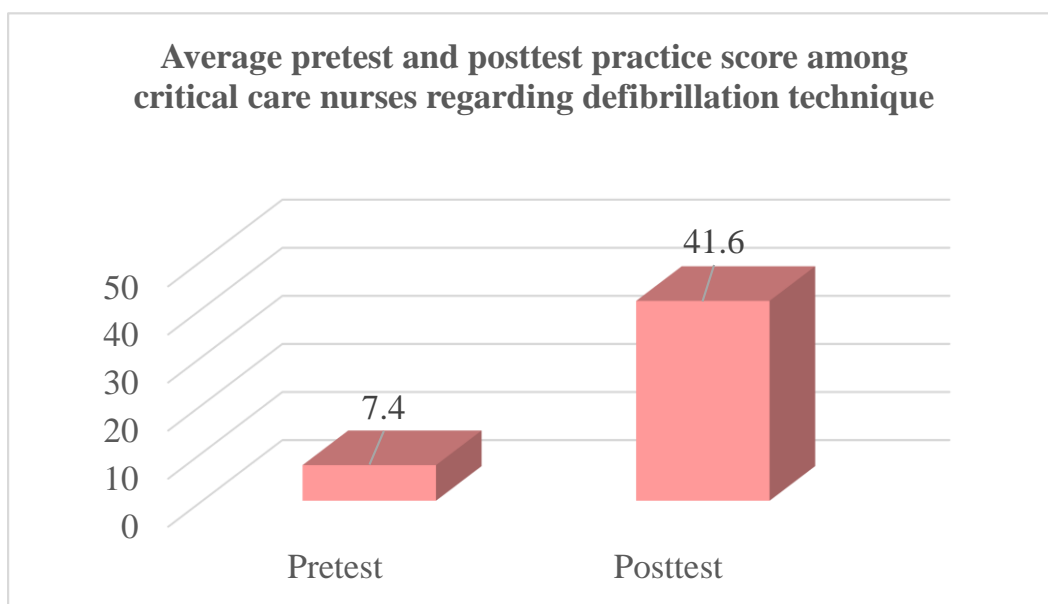
Section III
Analysis of data related to the association between practices of critical care nurses with selected demographic variable
Table 4: Fisher's exact test for association between practices of critical care nurses with selected demographic variable

N=50

Demographic variable		Practice		p-value
		Average	Poor	
Age in years	20-24 years	16	31	1.000
	25– 29 years	1	2	
Gender	Male	6	11	1.000
	Female	11	22	
Religion	Hindu	10	24	0.414
	Christian	4	7	
	Other	3	2	
Education	GNM	0	1	1.000
	Post Certificate	17	32	
Work Experience in years	0-1 years	14	27	1.000
	2-3 years	3	6	

Area of Work	MICU	5	9	
	SICU	4	12	0.255
	CVT ICU	6	4	
	RICU	2	8	

Since all the p-values are large (greater than 0.05), none of the demographic variables were found to have significant association with practices of critical care nurses with selected demographic variable.

Summary:

This chapter deals with the analysis of the data collected during the study. Findings showed that there is a highly significant difference between the pre-test and post-test Practice scores. The simulation Teaching significantly brought about an improvement on the Practice scores regarding defibrillation among subjects in selected Intensive care units..

The study could thus help in increasing the Practice skill on defibrillation. The simulation Teaching was effective in improving the Practice scores regarding defibrillation among critical care Nurses of 20-35 years of age.