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To Evaluate the Efficacy of Scenario-based Education on Understanding of Defibrillation among staff Nurses in a Selected Hospital in Bhopal

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Abstract: The first medical personnel to notice a patient experiencing cardiac arrest are often nurses. Of all emergency situations, cardiac crises are the one that contributes most to the rates of death and morbidity. Using a non-probability convenient sampling strategy, the study was carried out at Chirayu Medical College And Hospital,Bhopal, with a sample size of 60 chosen.
The conceptual framework was developed using Imogene King's goal attainment model, and the present study employed a one-group pre test-post test research design. The structured knowledge questionnaire was employed to evaluate the knowledge of staff nurses regarding defibrillation. The data analysis revealed a substantial difference between the pre-test and post-test knowledge scores. Consequently, it was determined that the Scenario based teaching significantly enhanced the knowledge of staff nurses regarding defibrillation.

INTRODUCTION

In India, recent statistics show in-hospital cardiac arrest (IHCA) survival rates remain relatively low, especially compared to out-of-hospital cardiac arrest (OHCA) survival rates in similar environments worldwide. IHCA survival to discharge is estimated around 13.6%, with good neurological outcomes in only about 14.4% of these survivors. Key factors influencing outcomes include the location of the arrest within the hospital (with ICU patients faring slightly better), patient age, and initial rhythm, with pulse less ventricular tachycardia (VT) or ventricular fibrillation (VF) showing better neurological outcomes compared to asystole or pulse less electrical activity (PEA).

Gender differences have also been observed; female patients have shown a marginally higher likelihood of survival with good neurological status, while bystander CPR remains critical for OHCAs, though rates of bystander intervention are still low at about 26% in urban settings.

CPR protocol improvements, response times, and use of advanced interventions like real-time monitoring tools have shown potential benefits, but resources and training discrepancies still influence survival and neurological outcomes across healthcare facilities in India.

For a more detailed statistical breakdown, studies like the Arrest Outcome Consortium Registry and data from the Indian Journal of Critical Care Medicine provide further context on survival rates and intervention efficacy in India's hospital systems

STATEMENT OF PROBLEM

Objectives of the study:

- To assess the knowledge regarding defibrillation among staff nurses.
- To evaluate the efficacy of Scenario based teaching on knowledge regarding defibrillation among staff nurses.
- To associate the post-test knowledge of staff nurses regarding defibrillation with selected demographic variables.

Assumption: -

- The nurses may have some knowledge on defibrillation.
- The knowledge of nurses may vary from one another.
- The Scenario based teaching program may increase knowledge about defibrillation.

Hypothesis:-

H1 - There is a significant increase in knowledge of staff nurses regarding defibrillation.
H0 - There is no significant increase in knowledge of staff nurses regarding defibrillation.

RESEARCH METHODOLOGY

The strategy employed to assess staff nurse's knowledge of defibrillation involves an evaluative approach aimed at determining the effectiveness of scenario-based education in enhancing their understanding of defibrillation within a specific institution. This investigation utilized a one-group pre-test and post-test research design. The study was conducted at Chirayu Medical College and Hospital. The study's population consisted of all staff nurses employed in hospital emergency rooms and intensive care units. A straightforward non-probability selection procedure was employed to select 60 staff nurses from a designated hospital.

RESEARCH APPROACH

This study employed an evaluative approach. This approach was chosen to assess the effectiveness of the intervention (planned teaching) in enhancing the knowledge of staff nurses in the selected hospital concerning defibrillation.

This approach enables the description of staff nurses' knowledge concerning defibrillation. The evaluative approach will assist the investigator in assessing the impact of the planned teaching intervention on the knowledge variable of staff nurses.

RESEARCH DESIGN

Research design constitutes a comprehensive framework for addressing the research question and managing challenges encountered during the research process. It also facilitates the specification of the study to be employed in the research endeavor. The research design aids the researcher in selecting subjects, manipulating experimental variables, collecting data, and determining the appropriate statistical analysis for data interpretation.

This study employed a one-group pre-test and post-test research design. A pre-test was conducted using a structured questionnaire labelled O1, followed by a planned teaching intervention represented as X. A post-test was then administered using the same structured questionnaire, labelled O2.
The study design was depicted as

Simplified Overview of Study Design

PRE TEST	INTERVENTION	POST TEST
DAY 2	DAY 2	DAY 7
O1	X	O2

SETTING OF THE STUDY

The setting refers to the specific physical location and conditions under which data collection occurs. This investigation is carried out in a chosen hospital in Bhopal. The investigation took place at Chirayu Medical College and Hospital, Bhopal. The investigator determined that the setting was suitable for the study due to the availability of a sufficient number of staff nurses who could participate, as well as the cooperation of hospital authorities who granted permission to proceed with the research. The data collection occurred within the operational hours of the hospital.

POPULATION:-

This study focused on the entire population of staff nurses employed in ICUs and emergency departments within the hospital setting.

TARGET POPULATION

In this study the target populations were the staff nurses of selected hospital of Bhopal.

ACCESSIBLE POPULATION

The accessible populations for this study were the staff nurses of selected hospital of Bhopal.

VARIABLES.

Independent Variable:-

The independent variable in this study is scenario based teaching regarding defibrillation.

Dependent variable:-

The dependent variable in this study is knowledge of staff nurses.

SAMPLE:-

In this study samples were staff nurses who were fulfilling the inclusion and exclusion criteria.

SAMPLE SIZE

In this study sample size were 60 staff nurses of selected hospital of Bhopal.

SAMPLING TECHNIQUE

The sampling technique used in the study was non probability convenient sampling.

SAMPLING CRITERIA:-

Inclusion criteria:-

- Registered nurses employed in specific intensive care units and emergency departments of chosen hospitals in Bhopal.
- Registered nurses who are interested in participating and are available during the data collection phase.
- Staff nurses who possess the ability to read and comprehend English.

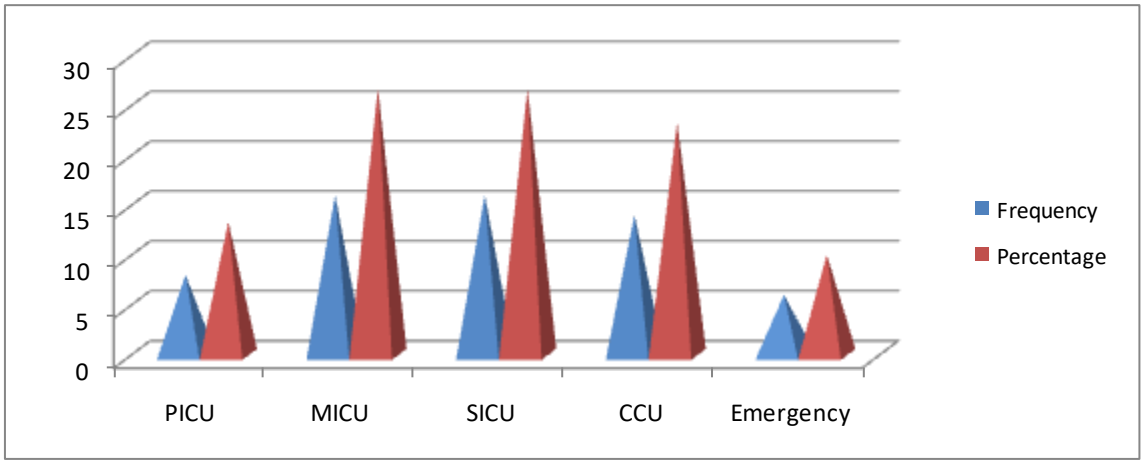
Exclusion criteria:-

- Staff nurses those who have attended in-service education program regarding defibrillation.
- Staff nurses who have done basic Life Support (BLS) or Advanced Cardiac Life Support (ACLS) course of American Heart Association
- Staff nurses those who are done M. Sc. Nursing Course.

RESULTS

SECTION -I: THE DEMOGRAPHIC DATA OF STAFF NURSES

Distribution of subjects according to their age shows that 46,(78.2%) were from age group of 21-30 years and 14(21.8%) of subjects from age group of 31-40 years. Distribution of subjects according to their sex shows that the majority 50 (83.3%) of the subjects were females and 10 (16.7%) of subjects were males. Distribution of subjects according to their professional qualification shows that 41 (68.3%) of subjects were possessing G.N.M, and 8 (13.4%) were B.Sc. Nursing and 11 (18.3%) of subjects were possessing P.B.BSc. Nursing.



SECTION –II:ASSESSMENT OF KNOWLEDGE REGARDING DEFIBRILLATION AMONG STAFF NURSES.

Table 2: Knowledge assessment with Pre Test (n= 60)

Level of knowledge score	Score Range	Percentage Range	Frequency	Percentage
Poor	0-6	0-25%	4	8.33%
Average	7-12	26-50%	50	81.67%
Good	13-18	51-75%	6	10.00%
Excellent	19-24	76-100%	0	0.0%
Minimum Score -5	**Maximum Score -15**	**Mean Score 612/60 = 10.20**		

Table 2 shows that in pretest50 (81.67%) of study participants were having average knowledge whereas 6 (10.00%) were having good knowledge and 4 (08 .33%) were having poor knowledge. The minimum score in pretest was 5 and maximum score was 15. The mean score for the pretest was 10.20.

Table 3: Knowledge assessment with Post Test (n= 60)

Level of knowledge score	Score Range	Percentage Range	Frequency	Percentage
Poor	0-6	0-25%	0	0.0%
Average	7-12	26-50%	0	0.0%
Good	13-18	51-75%	10	18.33%
Excellent	19-24	76-100%	50	81.67%
Minimum Score - 15	Maximum Score - 22	Mean Score 1211/60 = 20.18		

Table 3 shows that in post test50 [81.67%] of subjects were having excellent knowledge and 10[18.33%] of subjects were having good knowledge. The minimum score in post test was 15, and maximum being 22. The mean score of post test was 20.18.

SECTION –III Comparison of knowledge in Pre Test and Post Test

Table 4: Comparison of knowledge in Pre Test and Post Test (n=60)

Level of Knowledge score	Score range	Percentage range (%)	Pretest score		Post test score	
			Frequency	Percentage (%)	Frequency	Percentage (%)
Poor	0-6	0-25%	4	8.33%	0	0.00%
Average	7-12	26-50%	50	81.67%	0	0.00%
Good	13-18	51-75%	6	10.00%	11	18.33%
Excellent	19-24	76-100%	0	0.00%	49	81.67%
Minimum score			5		15	
Maxmium score			15		22	
Mean score			612/60=10.20		1211/60=20.18	

Table 4 shows that the minimum score in pretest was 5 and the maximum score was 15. The minimum score in post test was 15 and maximum score in post being 22. The mean score of post test was 20.18, the same being 10.2 in pre test. In comparison to knowledge, in pre test50 (81.67%) of subjects were having average knowledge whereas in post test50 (81.67%) of subjects were having excellent knowledge and 10 (18.33%) of subjects were having good knowledge. It was statistically interpreted that post test knowledge score was significantly higher than the pre test knowledge score.

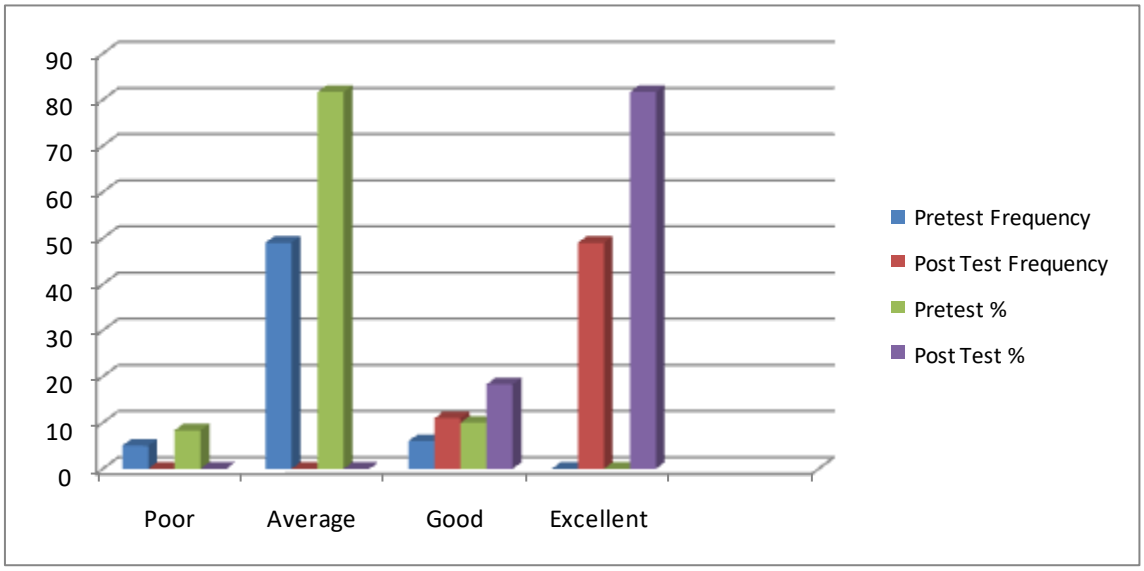


Figure 7:- Pre Test and Post Test Comparison in knowledge Score

Table 5: Significance of difference between knowledge score in pre and post test of staff nurses in relation to knowledge regarding defibrillation. (n=60)

Knowledge area	Mean Knowledge Score	SD	Mean Percentage	T=value	p-value
Pre Test	10.20	2.169	42.50%	34.468	0.000 S, p>0.05
Post Test	20.18	1.662	84.08%		

Table 5 shows the area – wise comparison of pretest and post test knowledge scores of the knowledge regarding defibrillation. Mean, standard deviations and mean score percentage values were compared and paired 't' test was applied at 5% level of significance. The tabulated 't' value for n=(60-1) 59 degrees of freedom was 2.00. The calculated 't' value was 34.46 for the areas of knowledge regarding defibrillation .The calculated 't' value was much higher than the tabulated value at 5% level of significance which was statistically acceptable level of significance. In addition the calculated 'p' values for all the areas of knowledge regarding defibrillation was 0.000 which was ideal for any population. Hence it was statistically interpreted that the scenario based teaching regarding defibrillation was effective. Thus the H 1 was accepted.

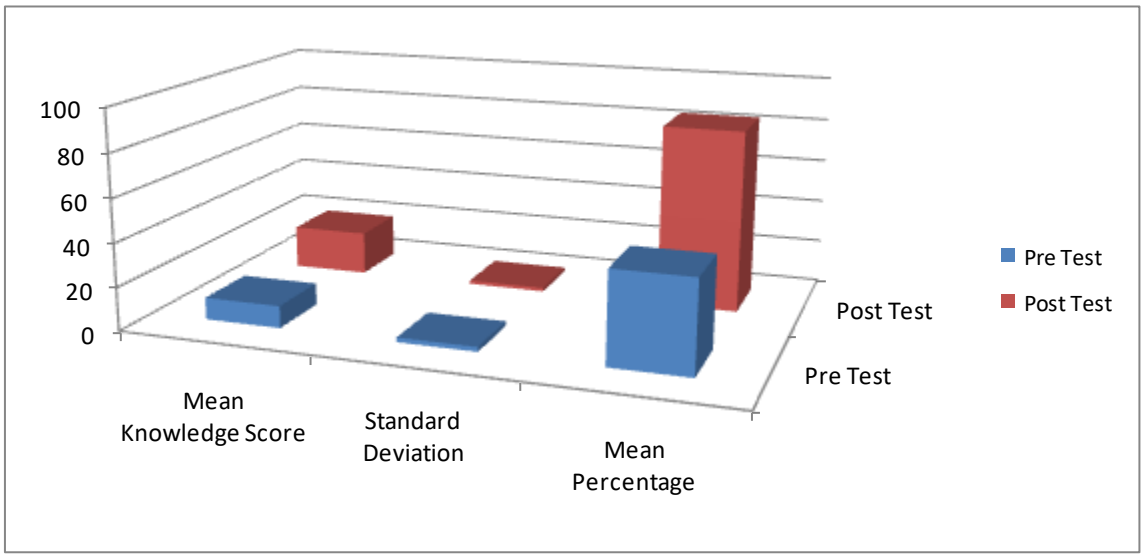


Figure 9:– Comparison of Pre Test and Post Test knowledge scores in terms of mean knowledge score and mean score percentage.

SECTION IV
ASSOCIATION OF KNOWLEDGE SCORE IN RELATION TO DEMOGRAPHIC VARIABLES

Table 6: Association of knowledge score of defibrillation in relation to age (n=60)

Age	No. of Staff nurse	Mean knowledge Score	SD	t-value	p-value
20-30 Yrs	50	20.09	1.767	0.869	0.157 NS
31-40 Yrs	10	20.54	1.198		p>0.05

Table 6 shows the association of post test knowledge scores with age of study participants. The tabulated 't' value was 1.98 which was higher than the calculated 't' value 0.869 at 5% level of significance. Also the calculated 'p' =0.157 was much higher than the acceptable level of significance ie. 'p' =0.05. Hence it was that age of the study participants was not associated with their post test knowledge score

Table:7 Association of knowledge score regarding defibrillation in relation to gender (n=60)

Gender	No. of Staff Nurses	Mean knowledge Score	SD	t-value	p-value
Male	20	20.70	1.418	1.078	0.649 NS.
Female	40	20.08	1.700		p>0.05

Table: 7 shows the association of post test knowledge scores with gender of study participants. The tabulated 't value was 1.98 which was higher than the calculated 't' value 1.078 at 5% level of significance. Also the calculated 'p' 0.649 was much higher than the acceptable level of significance i.e 'p' =0.05. Hence it was interpreted that gender of the study participants was not associated with their post test knowledge scores.

Table : 8 Association of knowledge score regarding defibrillation in professional qualification. n=60

Stream of education	No. of Staff Nurses	Mean knowledge Score	SD	F-value	p-value
G.N.M	31	20.05	1.731		0.646 NS,
B.Sc Nursing	18	20.38	1.923	0.440	p>0.05
P.B.B.Sc Nursing	11	20.55	1.214		

Table: 8 show the association of post test knowledge scores with the professional qualification of study participants. The tabulated 'F' (one way ANOVA) value was 3.34 which was higher than the calculated 'F'=0.440 at 5% level of significance. Also the calculated 'p'=0.646 was much higher than the acceptable level of significance i.e 'p'=0.05 Hence it was interpreted that professional qualification of the study participants was not associate with their post test knowledge scores.

Table: 9 Association of knowledge score regarding defibrillation in relation to clinical experience in Years. (n=60)

Clinical Experience	No. of Staff Nurses	Mean knowledge Score	SD	f-value	p-value
0-5 Years	40	20.16	1.661		
6-10 Years	15	20.00	1.954		0.821 NS
11-15 Years	3	21.00	1.000	0.305	p>0.05
More than 15 Years	2	20.50	0.707		

Table 9: show the association of post test knowledge scores with the clinical experience of study participants. The tabulated 'F' (one way ANOVA) value was 3.34 which was higher than the calculated 'F' =0.305 at 5% level of significance. Also the calculated 'p' =0.821 was much higher than the acceptable level of significance i.e 'p'=0.05. Hence it was interpreted that years of clinical experience of the study participants was not associated with their post test knowledge scores.

Table: 10 Association of knowledge score regarding defibrillation in relation to area of experience (n=60)

Area of Experience	No. of Staff Nurses	Mean knowledge Score	SD	f-value	p-value
PICU	5	20.63	1.302		
MICU	19	20.06	1.843		0.853 NS
SICU	15	19.88	1.708	0.335	p>0.05
ICCU	15	20.36	1.646		
Emergency	6	20.33	1.862		

Table :10 show the association of post test knowledge scores with the area of experience of study participants. The tabulated 'F' (one way ANOVA) value was 3.34 which was higher than the calculated 'F' =0.335 at 5% level of significance. Also the calculated 'P' = 0.853 was much higher than the acceptable level of significance i.e 'p' 0.05.

Hence it was interpreted that area of experience of the study participants was not associated with their post test knowledge scores

RECOMMENDATIONS

1. A comprehensive study involving hospitals nationwide could be undertaken to assess the level of knowledge about defibrillation, allowing for broader generalization of the findings.
2. An investigation could be performed to compare the effectiveness of scenario-based teaching against other instructional methods concerning defibrillation.
3. A comparative analysis could be executed to evaluate the knowledge of nurses in government versus private hospitals regarding defibrillation.

IMPLICATIONS OF THE STUDY

1. The results of this study carry significance for nursing administration, nursing education, nursing research, and nursing practice.
2. The contents of scenario-based teaching will assist nursing professionals in hospitals in reinforcing their knowledge and skills related to defibrillation.
3. The study's findings will assist nursing personnel in evaluating emergency situations and taking appropriate actions to save lives.

CONCLUSION

The staff nurses possess incomplete knowledge concerning defibrillation. The introduction of scenario-based teaching led to a notable enhancement in the understanding of the subjects. Following the intervention, the post-test results indicate that the majority of subjects demonstrated very good knowledge, with some exhibiting excellent knowledge, while none fell into the categories of good, poor, or very poor levels of knowledge. It was determined that scenario-based teaching on knowledge regarding defibrillation proved to be an effective educational strategy.