

**EFFECTIVENESS OF SIMULATION BASED LEARNING ON
KNOWLEDGE AND COMPETENCE REGARDING CARDIO-
PULMONARY RESUSCITATION (CPR) AMONG III-YEAR B.SC.
NURSING STUDENTS IN SELECTED NURSING COLLEGES, HUBBALLI**

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Abstract

Cardiopulmonary Resuscitation is an emergency procedure used to treat victims of cardiac and respiratory arrest. The use of Simulation-based Learning in nursing education is practically beneficial since it bridges the theoretical and practical knowledge gaps through creative teaching and learning methods. An evaluative study was conducted among 40 III-Year B.Sc Nursing Students of selected colleges of Hubballi. Probability: Simple Random Sampling technique was used to select the sample and data was collected by structured knowledge questionnaire and observational checklist. The research design used for the study was pre-experimental: one group pre-test post-test design. Data analysis was done by using descriptive and inferential statistics. Overall result of the study revealed the level of knowledge among 40 III – Year B.Sc Nursing Students regarding CPR during pre-test 29(72.5%) had average knowledge, 07(17.5%) had good knowledge and 4(10%) had poor knowledge. After Simulation Based Knowledge in post-test

majority of the subjects 32(80%) had good knowledge and 08 (20%) had average knowledge and no one had poor knowledge regarding CPR. Regarding level of competence among III – Year B.Sc Nursing Students regarding CPR during pre-test 32(80%) had satisfying and 5(12.5%) had poor competence and 3(7.5%) had excellent competence. After Simulation Based Learning in post-test all the subjects 40(100%) had excellent competence regarding CPR. The calculated paired ‘t’ value ($t_{cal}=41.98$) was greater than the tabulated paired ‘t’ value ($t_{tab}= 2.02$). In case of competence the calculated paired ‘t’ value ($t_{cal}=43.04$) was greater than the tabulated paired ‘t’ value ($t_{tab}= 2.02$). This indicates that the gain in knowledge and competence score was statistically significant at 0.05 level of significance. There was a positive Correlation between knowledge and competence score was $r_{xy} = 0.12$ ($1>r_{xy}>0$). Thus, the Simulation Based Learning was effective in enhancing knowledge and improving competence regarding Cardio-Pulmonary Resuscitation.

KEYWORDS: Cardio-Pulmonary Resuscitation, knowledge, competence, Simulation Based Learning, Nursing Students.

INTRODUCTION:

Health is wealth. Good health is essential aspect of human life. Fitness is the cornerstone of good health. One can live life to the fullest only by maintaining good health and fitness. However, the foods we eat and the amount of activity we choose to do, dramatically affect the overall health of the heart and the many other tissues that make up cardiovascular system.¹

Heart receives its blood supply from the right and left coronary arteries which originates from aorta.² Any damage to the coronary artery reduces the pumping power of heart. When the heart fails to contract effectively; cardiac arrest occurs. Brain death occurs within 3-5 minutes after the cardiopulmonary arrest. Cardio Pulmonary Resuscitation effectively keeps blood to brain and other vital organs of body, giving the victim better chance for recovery. Now a days accidents, vascular disorders and cardiac arrest are common cause of death.³

Cardiac arrest remains a serious public health problem and a leading cause of death all over the world. Immediate action, good skills and proper knowledge of CPR is a life saving technique. The main need of CPR study is learn to maintain blood circulation, open airway and provide artificial breathing. It provides basic life support until the medical and advanced life support arrives.⁴

CPR is an emergency procedure used to manage the victims of cardiac and respiratory arrest. It is done with great urgency to avoid the brain damage or death results from 4-6 min without oxygen. CPR involves chest compressions at least 5 cm deep and at a rate of at least 100 per min in an effort to create artificial circulation by manually pumping blood through the heart.⁵

Studies show that students’ competency in CPR is deficient, indicating that better training is necessary during nursing education. This study reports on the differences in nursing students’ competence in CPR before and after a longitudinal pedagogical intervention across the curriculum. Changes in the curriculum were relocation and added testing of CPR skills, inclusion of a course in defibrillation, a knowledge test as stimuli before simulation, and more simulation

practice with deteriorating patients.⁶

Simulating real – world medical emergencies can help medical staff to prepare for actual and critical events. It also improves CPR knowledge and psychomotor skills and enhances competency in the individuals.⁷

Therefore, training programs in CPR would make a significant contribution to the elimination of nurses and nursing students' anxiety and an increase in their self confidence in both knowledge and competence. As a result, effectiveness in dealing with a SCA individually or as members of a team could also be improved.

MATERIALS AND METHODS:

Study Design:

The research design used for the present study was pre-experimental: one group pre-test, post-test design.

O₁: Pre-test (assessment of knowledge and competence through structured knowledge questionnaire and observational checklist)

X: Administration of Simulation Based Learning.

O₂: Post- test assessment of knowledge and competence through structured knowledge questionnaire and observational checklists.

Setting and Sample:

In the present study, 40 the B.Sc Nursing students were selected samples through Probability; Simple Random Sampling technique.

Measurements:

The subjects were given Socio-demographic sheet and the structured knowledge questionnaire. In instrument –I, this section consists of 39 items for obtaining level of knowledge regarding CPR. In instrument –II, this section consists of 20 items for obtaining level of competence. Each correct answer carries 1 mark and incorrect answer carries 0 mark. The tool was validated by the experts in the field of Medical Surgical Nursing and by the members of the research committee of KLES' Institute of Nursing Sciences, Hubballi. The tool was tested for reliability by using Split Half Method and applying Karl Pearson's Correlation Coefficient formula. The reliability of Structured knowledge questionnaire was $r = 0.82$ and check list was $r = 0.83$.

Data Collection:

Formal Permission was obtained from Principal of KLES' Institute of Nursing Sciences, Hubballi. Investigator introduces herself to the B.Sc Nursing students and explains about her aims, objectives and steps of the study. Informed consent was obtained from the subjects. Data was collected using the structured knowledge questionnaire on 1st day. Administration of the simulation – based learning regarding Cardio – Pulmonary Resuscitation was carried out on the same day. The post test of the study was carried out after 7 days of administering the Simulation – based learning approach using the same tool as in the pre-test. The collected data was tabulated and analysed.

Data Analysis:

The data obtained were analyzed in terms of the objectives of the study using descriptive and

inferential statistics. Tabulation of data in terms of frequency, percentage, mean, median, mode, standard deviation and range to describe the data. Classify the knowledge scores as follows:

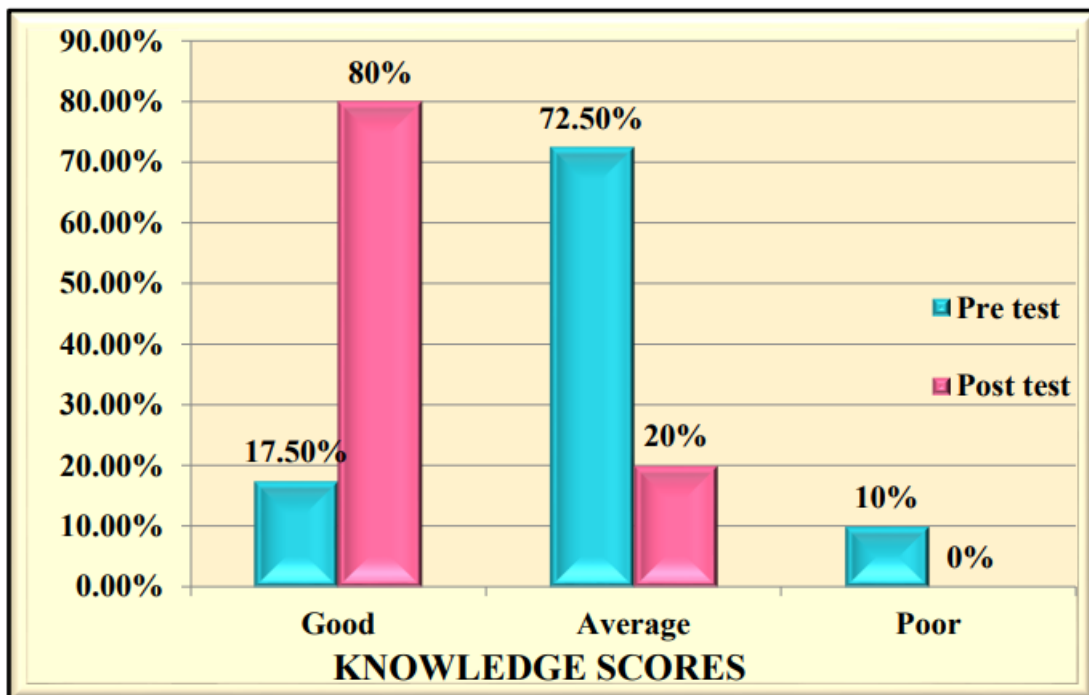
- Good Knowledge = $(\bar{X} + SD)$ and above
- Average knowledge = $(\bar{X} + SD)$ to $(\bar{X} - SD)$
- Poor knowledge = $(\bar{X} - SD)$ and below

[Note: $\bar{X}$ = Mean, SD = Standard Deviation]

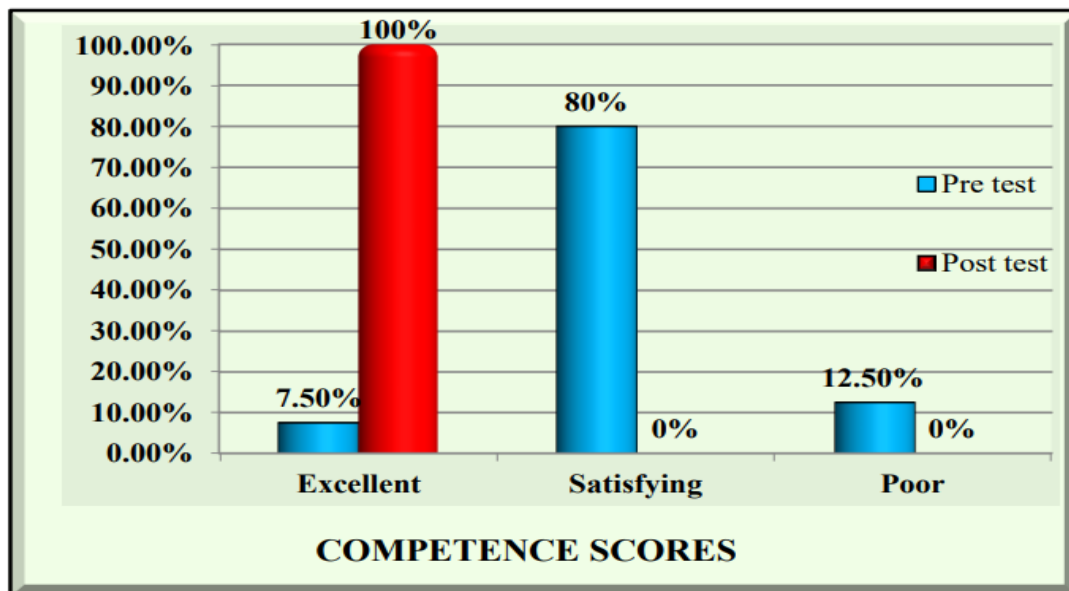
RESULTS:

Pre and Posttest level of knowledge score

Level of pretest knowledge scores n=40



Graph 1: The column graph represents percentage distribution of subjects according to their level of knowledge scores in pre-test and post-test. Most of them in the pre-test 29(72.5%) had average knowledge, 07(17.5%) had good knowledge and 4(10%) had poor knowledge. After Simulation Based Learning in post-test majority of the subjects 32(80%) had good knowledge and 08 (20%) had average knowledge and no one had poor knowledge regarding Cardio – Pulmonary Resuscitation.



Graph 2: The cylindrical graph represents the percentage distribution of level of competence during pre-test and post-test. Most of them in the pre-test 32(80%) had satisfying and 5(12.5%) had poor competence and 3(7.5%) had excellent competence. After Simulation Based Learning in post-test all the subjects 40(100%) had excellent competence regarding CPR.

n=40

Mean Difference ($\bar{d}$)	Standard error of difference ($S\bar{d}E$)	Paired 't' values	
		Calculated	Tabulated
14.07	2.73	41.98*	2.023

Table No 1: Mean difference ($\bar{d}$), Standard Error of difference and paired 't' values of knowledge scores of subjects

The calculated paired 't' value ($t_{cal}=41.98$) was greater than the tabulated paired 't' value ($t_{tab}=2.023$). Hence hypotheses $H_{4.3}$, $H_{4.5}$, and $H_{4.8}$ were accepted in these variables. Whereas in regards with remaining variables there were no association found, hence hypothesis was rejected in these cases. In level of competence, the calculated paired 't' value ($t_{cal}=43.04$) was greater than the tabulated paired 't' value ($t_{tab}=2.02$). Hence hypotheses $H_{5.2}$, $H_{5.4}$, $H_{5.5}$, and $H_{5.6}$ were accepted in these variables. Whereas in regards with remaining cases variables there were no association

found, hence hypothesis was rejected in these cases. This indicates that the gain in knowledge and competence score was statistically significant at 0.05 level of significance. Therefore, the Simulation Based Learning approach was effective to improve the knowledge and competence of subjects.

DISCUSSION:

The proposed study was undertaken to evaluate the effectiveness of simulation based learning on knowledge and competence regarding cardio- pulmonary resuscitation (CPR) among III-year B.Sc. nursing students in selected Nursing Colleges, Hubballi.”

The overall pre-test and post-test level of knowledge regarding CPR. Majority of them in the pre-test 29 (72.5%) had average knowledge, 07 (17.5%) had good knowledge and 4 (10%) had poor knowledge. In the post test majority of the subjects 32(80%) had good knowledge and 8 (20%) had average knowledge scores. These findings were supported by the study conducted by Kumari S , Kumar S, Patel S, Minz N where majority of participants 31(51.6%) had poor knowledge, 29 (48.4%) had average knowledge in pre-test whereas in post-test majority 47(78.33%) had good knowledge 11 (18.33%) very good knowledge and 2 (3.34%) had average knowledge.⁴

In the level of competence, pretest majority of the subjects 32(80%) were having satisfying competence, 5 (12.5%) had poor competence and 3(7.5%) had excellent competence whereas in post- test all the subjects 40(100%) had excellent competence. This study was supported by the study conducted by Rani mol P.V, Dr Chaudhary P, Kaur R in level of practice 51.7% had poor practice, 48.3% had average practice and 0% had good practice whereas in post-test 71.7% had good practice, 26.7% had average practice and 1.6% had poor practice.⁸

The calculated paired ‘t’ value ($t_{cal}=41.98$) was greater than the tabulated paired ‘t’ value ($t_{tab}=2.023$). Hence, H_1 was accepted. This indicates that the gain in knowledge score was statistically significant at 0.05 level of significance. Therefore, the Simulation Based Learning approach was effective to improve the knowledge of subjects. These findings were supported through a study conducted by Prasad G, Oliver J which revealed that the calculated paired ‘t’ value ($t_{cal}=17.91$) was greater than the tabulated paired ‘t’ value ($t_{tab}=2.02$). This indicates that the gain in knowledge score was statistically significant at 0.05 level of significance. Hence, it was statistically interpreted that the Simulation Based Learning approach was effective to improve the knowledge regarding Cardio-Pulmonary Resuscitation of subjects.⁹

In the present study there was positive correlation ($r_{xy}=0.12$) between pre-test knowledge and competence scores of III-Year B.Sc. Nursing Students regarding CPR. Hence H_3 was accepted. The study is supported by the study done by Sunam H K, Kanagavalli R, Prathiba G which revealed that there was a significant positive correlation ($r_{xy}=0.89$) between knowledge and competence scores.¹⁰

In the present study, the computed chi-square values related that there were statistical associations between pre-test knowledge scores and three of the selected socio-demographic variables, i.e. area of residence, education status of father and occupation of mother. These findings were supported though a study conducted by Gurung P, Mishra S, Chandrakar K which revealed that there were significant association between pre-test knowledge scores with area of

residence, education status of father and occupation of mother.⁵

In the present study, the computed chi-square values related that there were statistical associations between pre-test competence scores and four of the selected socio-demographic variables, i.e. gender, type of family, education status of father and education status of mother. These findings were supported though a study conducted by Gurung P, Mishra S, Chandrakar K which revealed that there were significant association between pre-test competence scores with gender, type of family, education status of father and education status of mother.⁵

CONCLUSION:

The overall study is to evaluate the effectiveness of Simulation Based Learning on knowledge and competence regarding CPR among III- Year B.Sc. Nursing Students in selected Colleges, Hubballi, enhancing in Nursing education, Nursing practice, Nursing administration and Nursing research. The Simulation Based Learning was effective in enhancing and upgrading the knowledge and changing the competence of III- Year B.Sc. Nursing Students. Thus, it can guide the new learner to make an in depth study about this topic and compare findings through it. The study concluded that, the Simulation Based Learning was effective in enhancing knowledge and improving competence regarding Cardio-Pulmonary Resuscitation.

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