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RESEARCH ARTICLE

EFFECTIVENESS OF SIMULATION-BASED TRAINING ON KNOWLEDGE AND PRACTICE REGARDING CARDIO PULMONARY RESUSCITATION (CPR) AMONG 1ST YEAR B.SC. NURSING STUDENTS OF SIKKIM

[1]Rovino Khate, [2]Mrs. Wangkheimayum Ashalata Devi and [3]Mrs. Arkierupaia Shadap

[1]M.Sc. Nursing, Skkim Manipal College of Nursing, SMIMS, SMU, 5th Mile Tadong, Gangtok, Sikkim
[2]Professor, Skkim Manipal College of Nursing, SMIMS, SMU, 5th Mile Tadong, Gangtok, Sikkim
[3]Associate Professor, Skkim Manipal College of Nursing, SMIMS, SMU, 5th Mile Tadong, Gangtok, Sikkim

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***Corresponding author:** *Rovino Khate*

ABSTRACT

Background: Heart disease is the leading cause of death globally. Cardiacarrest is a potentially fatal condition that needs immediate treatment in order to save lives and prevent lasting damage to vital organs. Cardiopulmonary Resuscitation (CPR) is an emergency lifesaving procedure performed when someone is experiencing cardiac arrest. **Aim:** The study aimed to evaluate how well nursing students' knowledge and practice of cardiopulmonary pulmonary resuscitation were affected by simulation-based training. **Methods & Materials:** Pre experimental one group pretest-posttest study design was adopted. The study was conducted among first year B.SC Nursing students with purposive sampling technique. The structured knowledge questionnaire and practice checklist were used to evaluate knowledge lrvel and practice score of students. Pre-test and post test knowledge level and practice score were evaluated before & after the simulation-based training was given. **Results:** the findings showed that in Pre-test most 57(63.3%) of the students had average knowledge; where as in post-test most 54(60%) had good knowledge. In the practice, in pretest the majority 87(96.7%) of the students had poor practice, where as in post-test, most 51(56.7%) had poor practice. The mean post-test knowledge (17.37±3.456) and practice(6.12±2.060) score of the students were significantly higher than their mean pre-test knowledge (11.82±4.038) and practice(2.83±1.448) score. The paired t-test revealed effectiveness of Simulation-based Training on CPR that was effective in improving knowledge (t=15.6)and practice(t=16.8) of the adolescents. **Conclusion:** Based on study results it can be concluded that simulation-based training regarding CPR can improved the 1st year B.Sc. Nursing students' knowledge and practice which would make them competent enough to handle emergency life threatening situations at anywhere in any situation where someone is in need and can also save the life.

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INTRODUCTION

The biggest cause of death worldwide is cardiovascular disease. Cardiac arrest is the abrupt cessation of circulation and breathing of the heart. The procedure of externally sustaining a person's breathing and circulation after a cardiac arrest is known as cardio pulmonary resuscitation (CPR). Cardio Pulmonary Resuscitation is a lifesaving procedure.[1]CPR is used to reestablish and sustain respiration and circulation as well as to give the heart, brain, and other essential organs access to oxygen-rich blood. If a person is unconscious and not breathing, CPR should be done. While Advanced Cardiac Life Support (ACLS) is the supportive medical care that healthcare providers provide in hospitals.

Simulation training is the process of creating a learning environment that closely resembles the tasks and circumstances that occur in the actual world. Trainees are given the opportunity to apply real information and skills by engaging in actual work rather than merely reading theory books or attending class. Simulated-based training may efficiently and affordably teach key skills to students. Purpose of simulation in nursing education is to accurately represent key elements of clinical setting so students can learn in a safe environment. Nursing students receive simulation training in addition to their practical education in hospitals, nursing homes, and outpatient clinics. Nursing students can care for a simulated patient through simulation.[2] Yadav J, Deep R. et.al. 2021, an experimental study to compare the effectiveness of simulation vs. traditional technique on understanding and

competency about BLS among 1st year B.SC Nursing and BPT student at SGT University, Gurugram. BLS was taught to the experimental group via a simulation technique, while the control group received standard instruction. A post-test was administered seven days later to gauge how knowledge and usage of BLS had changed. When compared to the pre and post-test knowledge (12.90), post-test average knowledge for the experimental group was high, at 18.40. In contrast to the mean pretest practice score of 4.50, the experimental group's mean practice score was high at 10.00. No discernible difference between before and after knowledge, as well as practice, was observed in the control group. It provided proof that simulation is a more efficient method than the traditional one for teaching BLS to students.[3] Nursing students, as frontline health care providers, must possess adequate knowledge and skills in CPR to respond effectively to emergencies in both clinical and outside hospital settings. The purpose of this study was to evaluate how well nursing students' knowledge and practice of cardiopulmonary pulmonary resuscitation were affected by simulation-based training.

Problem statement: Effectiveness of simulation-based training on Knowledge and practice regarding Cardio Pulmonary Resuscitation (CPR) among 1st year B.Sc. Nursing students of Sikkim**.**

Objectives

The objectives of this research are to:

- To assess pre-test and post-test knowledge level on CPR among Nursing students.
- To assess pre-test and post-test practice level on CPR among Nursing student.
- To find the correlation between pre-test knowledge and practice level regarding CPR among nursing student.
- To find the association between the pre-test knowledge level with selected demographic variables.

Variables

Independent variable: In this study, independent variables refer to the simulation-based training on CPR.

Dependent variable: In this study, dependent variables refer to knowledge and practice of CPR.

Demographic variables: In this study, it refers to demographic variables which consist of age, residence, religion, type of family, family history of cardiac arrest, previous knowledge of CPR, seen performing of CPR, previous source of knowledge of CPR.

METHODOLOGY

Research approach: quantitative approach.

Research design: pre-experimental one group pre-test post-test design.

Setting of the study: Sikkim Manipal College of Nursing (SMCON) ,5th Mile Tadong, East Sikkim.

Sample: Students enrolled in first-year B.Sc. Nursing programme of SMCON's for the academic session 2022–2023 made up the study's sample.

Sample size: 90

Sampling technique: Purposive (total enumerated) sampling technique.

Sampling criteria

Inclusion Criteria

- 1st year BSc Nursing student of SMCON
- age group (18-25)
- those who wanted to participate and give consent
- those who were accessible during the period of data collection

Exclusion Criteria

- Those who were absent during the time of data collection

Tools

Tool I: Demographic Proforma (Consists of 8 questions): Age, residence, religion, type of family, family history of cardiac arrest, seen anyone performing CPR, previous knowledge and source of knowledge of CPR.

Tool II Section A: Structured Knowledge Questionnaire(consist of 24 questions): Knowledge of anatomy and physiology of the heart, cardiac arrest, its causes, risk factors and its immediate management and the correct technique of giving CPR. The scores for the knowledge questions ranged from good (17–24), average (9–16), and bad (1–8).

Tool II Section B: Structured observational checklist on correct practice of giving CPR(consists of 18 questions): Correct performance of giving CPR according to AHA guidelines 2020. The 18 questionnaires on the observational checklist were scored on a scale of Good (13-18), Average (7-12), and Poor (1-6).

Validity/reliability: The validity, pretesting, reliability of the tool was done. The reliability of Tool-I was calculated using the inter-rater method and result found was reliable (100%), while reliability of Tool II Section A was calculated split-half approach and it was discovered to be reliable (r=0.87) and Tool II Section B reliability was computed using inter-rater method and the tool was 100% reliable. Pilot study was also carried out among 10 first-year B.Sc. Nursing students of Sikkim Professional University to see the feasibility of the final study.

Duration of the study: 6 weeks

Data Collection procedure: The final study was conducted at Sikkim Manipal College of Nursing (SMCON) from 19/11/22 to 3/12/22 with 90 students after getting formal permission from the principal. The study's objective was communicated to the students, and the responses' confidentiality was guaranteed.

Methods: Pre experimental one group pretest-posttest study design was adopted. The study was conducted among 90 first year B.SC Nursing student in December 2022 at Sikkim Manipal College of Nursing (SMCON) with purposive sampling technique. Pre-test knowledge level and practice scorewere evaluated after which simulation-based training was given to the samples. Post-test was conducted after 7 days. The structured knowledge questionnaire and practice checklist were used to evaluate knowledge level and practice score of the students.

Data analysis & interpretation: The data were categorized and analyzed using descriptive and inferential statistics using SPSS version 24.

Results: The result of study findings are organized in the following sections

Section I: Findings related to frequency and percentage distribution of demographic variables of nursing students.

Section II: Findings related to level of knowledge regarding CPR among Nursing students.

Section III: Findings related to level of practice regarding CPR among Nursing students.

Section IV: Findings related to correlation between level of knowledge and practice regarding CPR among Nursing students.

Section V: Findings related to association between levels of knowledge with selected demographic variables.

Section I: Findings related to frequency and percentage distribution of demographic variables of nursing student:

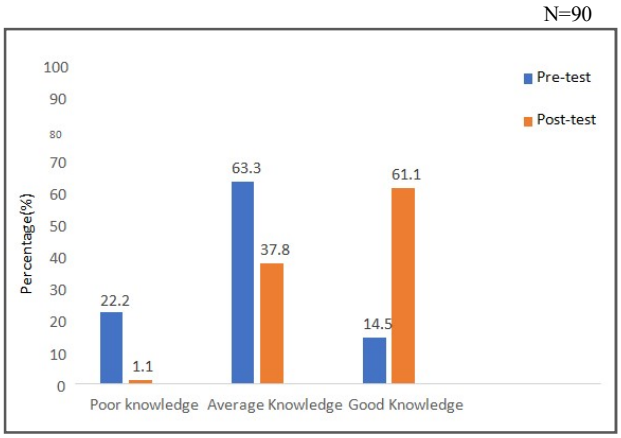
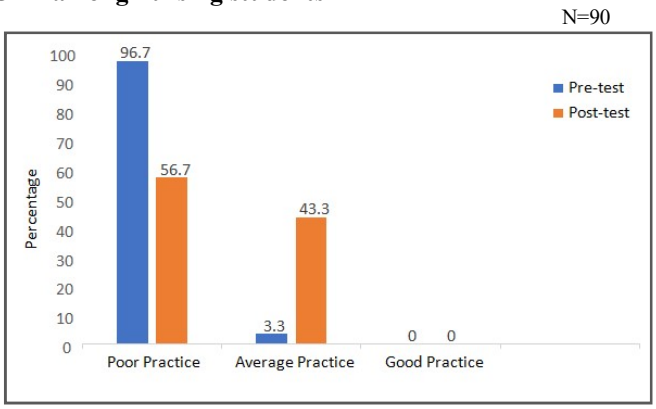


Fig. 1. Bar diagram representing Pre-test and Post-test level of knowledge regarding CPR among Nursing Student

The study showed that majority 90(100%) of the students were from the age of 18–20 years,48 (53.3%) resides at home, 62(68.9) were Hindu religion, 67 (74.4%) were belong to nuclear family, 89 (98.9%) had no any family history of cardiac arrest, 69(76.7%) had not seen any one performed CPR, most of the students 53(58.9%) had previous knowledge about CPR and half 45(50%) of the student's source of information was from Book. The data presented in Fig-1 showed the level of knowledge regarding CPR. In Pretest majority 57(63.3%) had average knowledge, 20(22.2%) had poor knowledge and 13(14.5%) had good knowledge. In post-test level of knowledge, majority 55(61.1%) had good knowledge, 34 (37.8 %) had average knowledge and 1(1.1%) had poor knowledge. Table-1 showed that regarding CPR knowledge level the mean post test knowledge level (17.37±3.456) was greater than the mean pretest knowledge level(11.82±4.038), and the paired t-test was effective in improving knowledge (t=15.6)which showed the effectiveness of the simulation based training among the students. Hence the established hypothesis (H_1) was accepted.

Section-III: Findings related to level of practice regarding CPR among nursing students



The data presented in Fig 2, showed the level of practice regarding CPR. In Pre-test majority 87(96.7%) had poor practice, 3(3.3%) had average practice and no one had good practice 0(0%). In post-test, majority 51(56.7%) had poor practice, most 39(43.3 %) had average practice and 0(0%) had good practice.

The data in Table 2, showed that the mean post test practice score (6.12±2.060) was greater than the pretest practice score (2.83±1.448) and the paired t-test (t=16.813) showed the effectiveness in improving practice at $p<0.05$ level of significant. Hence the established hypothesis (H_2) was accepted.

Section IV: Findings related to correlation between knowledge and practice level regarding CPR among Nursing Student.

The data in Table 3 showed that there was significant positive correlation r=+0.75 between the pretest knowledge level and practice score. Hence, the established hypothesis (H_3) was accepted.

Section V: Findings related to association between levels of knowledge with their demographic variables

The data in Table 4showed that there was no significant association between pretest level of knowledge and their demographic variables. Hence the established Hypothesis (H_4) was rejected.

RESULTS AND DISCUSSION

The present study findings revealed that after administration of simulation based training, the mean post test knowledge level 17.37 was improved from the mean pretest knowledge level11.82 with a mean difference of 5.54 with a t value of 15.6and found to be significant at $p<0.05$ level.

Table 1. Mean, Mean Difference, Standard Deviation, t value, degree of freedom and level of significance of pretest and posttest knowledge level regarding CPR of Nursing Student.N=90

Sl. No	Knowledge	Mean	Mean Difference	Standard Deviation	t-value	df	P value
1.	Pre test	11.82	5.544	4.038	15.6	89	
2.	Post test	17.37		3.456			<0.001

*p<0.05

Table 2. Mean, Mean Difference, Standard Deviation, t value, degree of freedom and level of significance of pre-test and post-test level of practice regarding CPR of Nursing Student. N=90

Sl. No	Practice	Mean	Mean Difference	Standard Deviation	t-value	df	P value
1	Pre test	2.83	3.289	1.448	16.813	89	<0.001
2	Post test	6.12		2.060			

*P<0.05

Table 3. Karl Pearson's Correlation Coefficient was used to find the correlation between pretest knowledge levels and practice score regarding CPR among Nursing student

N=90

Sl. No	Pre test	Mean	SD	r
1	Knowledge	11.82	4.038	+0.75
2	Practice	2.83	1.448	

Table 4. Association between the pretest knowledge levels with their demographic variables

N=90

Sl. no	Variables	Level of knowledge			Fisher Exact Test	df	P value
		Poor	Average	Good			
1.	**Age in years**						
	a)18-20	20	57	13			
	b)21-23	0	0	0	NA	2	NA
2.	**Residence**						
	a)Home	6	34	8			
	b)Hostel	14	23	5	5.548	2	0.066^{NS}
3.	**Religion**						
	a)Hindu	15	41	6			
	b)Buddhist	4	14	6	4.445	4	0.304^{NS}
	c)Christian	1	2	1			
4.	**Type of family**						
	a)Joint family	5	17	1			
	b)Nuclear family	15	40	12	2.589	2	0.296^{NS}
5.	**Family history of cardiac arrest**						
	a)Yes	0	1	0			
	b)No	20	56	13	4.074	2	0.146^{NS}
6.	**Have you seen anyone performing CPR?**						
	a)Yes	7	10	4			
	b)No	13	47	9	0.747	2	0.770^{NS}
7.	**Previous knowledge of CPR**						
	a)Yes	14	32	7			
	b)No	6	25	6	0.752	2	0.743^{NS}
8.	**If yes, previous source of knowledge of CPR through**						
	a)Social media	5	14	5			
	b)Books	8	17	2			
	c)Friends	1	1	0	3.150	4	0.490^{NS}

*P<0.05 level of significance NS- Non significant

The mean post test practice score 6.12 was higher than the pretest practice score2.83 with a mean difference of 3.289 and the t value of16.813 and found to be significant at p<0.05 level. The finding was supported by study conducted by Kose S et.al.(2019)[4] in Africa found that the post-training knowledge scores were significantly higher than pre-training knowledge scores (t = -12.442, p=0.000), and was statistically significant difference between pre- and post-training skill scores (t= -22.899, p=0.000). The finding of the study was supported by another study conducted by Devi C S, Gogoi N, & Chetia P.[5]in 2017. The study revealed that after administration of the Skill Training Program among adolescents, the posttest knowledge mean score (13.98) was improved from the mean of pre-test knowledge score (6.53) with a mean difference of 7.45 with the t- value of 13.72 and found to be significant at p < .05 level and mean of post-test skill score (15.95) was higher than the mean pre-test skill score with t- value of 95.56 and found to be significant at p<0.05 level. The present study found that the correlation between the pre-test knowledge level and practice (r= +0.75)which showed a positive correlation between pretest knowledge and practice. This study is contradicted with the results of study conducted by Offiong D J, et.al.[6]at Nigeria in 2017 which showed no correlation was found between practice and understanding of cardiopulmonary resuscitation (r=0.09).

Present study found that there was no significant association between pretest knowledge score and demographic variables which was contradicted with the results of study conducted by Gogoi. N, Chetia. P *et al*, 2017 to assess the effectiveness of skill training program on CPR at Guwahati. It was found that there was significant association (x^2=4.44, df=1) between pre intervention knowledge and residence at significance level of P<0.05.

CONCLUSION

The study revealed that simulation-based training was successful in boosting nursing students' knowledge and practice in CPR. A positive correlation between pre-test knowledge level and practice was discovered and demonstrated how knowledge growth encourages nursing students to adopt best practices for CPR. It has been determined that the practice was subpar and the knowledge level was mediocre. This demonstrates the urgent need for appropriate educational interventions to improve nursing students' CPR knowledge and skills.

Conflict of interest: Nil

Source of funding: Self

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REFERENCES

Dierksen L, Bucher H. Assessment and management of clinical problems, Medical Surgical Nursing. Missouri: Elsevier. 2003; 6: 879.

Koukourikos K, Tsaloglidou A, *et al*. Simulation in clinical nursing education. Acta inform Medica 2021; 29(1):15-20. doi: 10.5455/aim.2021.29.15-20https://pmc/articles/PMC8116070/

Yadav J. Effectiveness of Simulation as a Technique vs Traditional Method on Knowledge and Practice Regarding Basic Life Support: An Experimental Study. Biosci Biotechnol Res Commun. 2021 Dec 25;14(4):1800-1805.DOI:10.21786/bbrc/14.4.62

Kose S, Akin S, Mendi O, Goktas S. The effectiveness of basic life support training on nursing students 'knowledge and basic life support practices: a non-randomized quasi experimental study. Afr health sci.2019 Jun 1;19(2):2252-62. DOI: https://dx.doi.org/10.4314/ahs.v19i2.51

Devi C S, Gogoi N, & Chetia P. Effectiveness of skill training programme on CPR among adolescents in selected colleges, Guwahati. Manipal Journal of Nursing and Health Sciences. 2017; 3(2): 20-24. https://impressions.manipal.edu/mjnhs/vol3/iss2/5

Offiong DJ, Ekpenyong A, *et al*. Knowledge And Practice Of Cardiopulmonary Resuscitation Among Public Health Nurse Practitioners In Calabar Metropolis Of CrossRiver State, Nigeria. https://www.researchgate. net/publication /313557667