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Effectiveness of simulation technique in teaching learning process of CPR among nursing students at PSG College of Nursing, Coimbatore.

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ABSTRACT

Simulation is a teaching device to make "theory" more practically oriented and realistic. Students can test various approaches in a setting where patients cannot be hurt and where wrong decisions can always be reminded. Objective was to assess the effectiveness of simulation technique in the teaching learning process of CPR. A pre experimental design, one group pre test-post test design was adopted. **S**tudy was conducted in the simulation lab at PSG hospitals, Coimbatore. Final year BSc Nursing students who were in the internship period delivering patient care were taken as sample. Sample size was 20**.** Simple random sampling technique was used. In pre-test, regarding knowledge on practice of CPR, majority of the students 16 were moderately adequate among which, 15 were inadequate in adult CPR and all were moderately adequate in infant and children CPR. In post-test, majority12 were adequate, 8 were moderately adequate and none of them were inadequate. Only 5 were inadequate in adult CPR and none were inadequate in infant and children CPR. The investigators demonstrated CPR to all the students and then allowed them to practice in the simulation lab. They observed their practice and found 15 practiced well and only 3 were poor. Majority of the students followed the correct steps of algorithm and techniques in positioning, breathing and chest compression. But they could keep up the time frame to a certain extent only. Hence their practice of CPR has revealed that simulation is an effective methodology in learning nursing procedures among students.

KEY WORDS: Simulation, CPR, Knowledge on Practice, Adult CPR, Infant And Children CPR.

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INTRODUCTION:

"Students can learn how to learn"

Archeological discoveries of sculptures, figurines and carved models reveal that techniques of simulation had been part of education even in times of antiquity. In ancient China, teaching acupuncture involved life-size bronze human figures filled with liquid, which had wax-covered perforations for the insertion of acupuncture needles . As many as 2,500 years ago, the comprehensive text on surgery Sushruta Samhita emerged in India. This volume, considered the precursor to Arabian and European medicine, describes in great detail methods of medical education using plant and animal models.

The use of simulation in medical education has a long history. Over the past 15 years it has become almost unthinkable to provide education to students and medical professionals without using some form of simulation. When one has enthusiasm, creativity and good ideas, satisfactory results in simulation medicine are possible, allowing higher quality education for medical professionals on the one hand and the protection of patients on the other.

Simulation is a teaching device to make "theory" more practically oriented and realistic. Students can test various approaches in a setting where patients cannot be hurt and where wrong decisions can always be reminded.

Background and significance of the study:

Alinier G et al[1] conducted a study to determine the effect of scenario-based simulation training on nursing students' clinical skills and competence. It enabled small groups of students to practice in a safe and controlled environment how to react adequately in a critical patient care situation. This type of training is very valuable to equip students with a minimum of technical and non-technical skills before they use them in practice settings.

Simulation is a versatile technique used in a variety of health care settings. Simulation ensures safe nursing practice by nursing students through bridging the gap between theory and practice. Simulation fosters critical-thinking and problem-solving skills. Simulation provides a chance to apply principles and theories students have learned and to see how and when these principles work.

Alexander, Nevena, Slandana, Nebojsa, Ljiljana[2,7,9] Simulation is becoming an increasingly important link in the so-called education chain, where students move from the acquisition of theoretical to that of practical knowledge through the use of simple simulators, going on to learn in high-fidelity simulations and simulation scenarios, and completing their education at the end of the chain with real patients in real circumstances. The application of simulation in medical education

changes the motto of the old, traditional method of learning – "See One, Do One, Teach One," into the new, more contemporary and successful "See One, Practice Many, Do One" .

When a simulation is performed, the focus is on teaching and the student, while, in real conditions, the patients - their treatment and protection from medical error, are always in the forefront . In this way, the fundamental medical ethics principle of "First, do no harm," is fully actualized.

Simulation permits the creation of scenarios that can rarely be encountered in typical student exercise classes, like emergencies, a pediatric intensive care unit or patient room, life-threatening or rare situations. Also, Simulation can be used in the design and testing of new clinical equipments

***Statement of the problem*:** Effectiveness of simulation technique in teaching learning process of CPR among nursing students at PSG College Of Nursing, Coimbatore.

Objectives:

1. To assess the teaching learning process of CPR
2. To apply simulation technique in the teaching learning process of CPR
3. To assess the effectiveness of simulation technique in the teaching learning process of CPR

Review of literature:

Ricketts B[3] conducted a study on **t**he role of simulation for learning within pre-registration nursing education - a literature review. The findings showed that simulated learning in a clinical skills laboratory is reported to increase student confidence and prepares students for real clinical setting, however, this acquisition of skill is often achieved at different rates by different students. A standardized approach to simulated learning in nursing education and the development of further holistic clinical scenarios are linked to related theory and lectures, would offer measurable learning outcomes to meet professional and regulatory requirements.

Fay Hillier TM et al.,[4]conducted a study on Communication and patient safety in simulation for mental health nursing education. JCAHO found that 65% of medical sentinel events or medical errors are associated with communication breakdowns. In addition to the JCAHO, The Institute of Medicine, in their Core Competencies for health care professional education, recommend improvement in professional communication, collaboration, and a patient-centered approach to provide safety. Consistency of opportunities for students to practice their communication and collaboration skills is through simulation.

Harris Ket al.,[5] conducted a study on theoretical framework for simulation in nursing. It provided a framework regarding the utility, application, and design of the training environment and

for developing effective training methods in health care domains and highlighted examples of how deliberate practice had been successfully applied to the training of psychomotor and cognitive skills.

Alexander, Nevena, Slandana, Nebojsa, Ljiljana,[2]A well-thought-out simulation scenario can be compared to a play that can only be devised by someone with vast clinical knowledge and experience in the area of medicine that the scenario treats. The creativity and innovation of the instructor are brought fully to light here. In simulation scenarios, we used the experiences of other authors who permit free access to a Template for Simulation Patient Design , based on which we designed a template appropriate to our conditions. The selection of each scenario requires defining the pedagogic goals and target trainees, the issues considered in the simulation, designing the simulation model, providing didactic materials, devices, instruments, manikins, equipment, consumable materials, and the video and audio files needed for executing the simulation. Before launching the scenario, the instructor prepares and double-checks the computer and audio equipment and rehearses the prepared simulation scenario. Each scenario entails a detailed preparation of the necessary data, which will show up on info screens and the patient monitor, controlled from the command room, audio and visual information, and heart sound and breathing sound files.

MATERIAL AND METHODS

A pre experimental design, one group pre test-post test design was adopted for this study. The study was conducted in the simulation lab at PSG hospitals, Coimbatore. Final year BSc Nursing students who were in the internship period delivering patient care at PSG hospitals were taken as sample. Sample size was 20**.** Simple random sampling technique was used.

Tool for data collection: Tool consists of 4 sections.

Section-I- Demographic data: It includes the baseline information about the students.

Section-II- Structured questionnaire on knowledge on practice of CPR on adult which consists of 23 items. Each item scores 1 mark.

Section-III- Structured questionnaire on knowledge on practice of CPR on infant and children which consists of 7 items. Each item scores 1 mark.

Scores were interpreted as 21-30 Adequate knowledge on practice, 11-20 Moderately adequate knowledge on practice and <10 Inadequate knowledge on practice.

Section-IV- Check list on practice of CPR which consists of 5 items to be marked as completely done, partially done and not done. The score ranges from 0-10 where 7-10 Well done, 4-6 Fairly done and 0-3 Poorly done.

Reliability was tested using Cronbach Alpha method, r value was found reliable r=0.

RESULT AND DISCUSSION

Table No. 1: "Demographic Data of the Nursing Students "

S. No	Demographic variables	Frequency	Percentage
1	Age		
	19 to 21 years	17	85%
	22 to 24 years	3	15%
2	Knowledge about CPR		
	Aware	20	100%
	Unaware	0	0%
3	Observed CPR in causality		
	Observed	19	95%
	Not Observed	1	5%
4	Performed CPR		
	Performed	8	40%
	Not performed	12	60%

Among 20 students who participated in the study, 85% were in the age group of 22-24 years and only15% between 19-21 years. 100% of the students were aware about CPR. Majority, 95% had a chance to observe CPR before. 60% did not get a chance to perform CPR before.

Table No.2: "Teaching learning process of CPR through Simulation among B.Sc Nursing students"

Knowledge on practice of CPR among Nursing students						
Knowledge Score	**Pretest**			**Posttest**		
	Adult	**Infant & Children**	**Total**	**Adult**	**Infant & Children**	**Total**
Adequate	0	0	0	2	10	12
Moderately adequate	5	20	16	13	10	8
Inadequate	15	0	4	5	0	0
Practice of CPR among Nursing students						
Practice Score	**Well done**		**Fairly done**		**Poorly done**	
	15		2		3	

In pre-test, regarding knowledge on practice of CPR, majority of the students 16 were moderately adequate among which, 15 were inadequate in adult CPR and all were moderately adequate in infant and children CPR. In post-test, majority12 were adequate, 8 were moderately adequate and none of them were inadequate. Only 5 were inadequate in adult CPR and none were inadequate in infant and children CPR.

Akhu-Zaheya et al[6] Faculty of Nursing, Department of Adult Health Nursing, Jordan University of Science and Technology (2012) conducted a study to test out the effectiveness of simulation on knowledge acquisition, knowledge retention and self efficacy of nursing students in Jordan. The purpose of this quasi-experimental research study was to examine the effect of high-fidelity basic life support (BLS) simulation on knowledge acquisition, knowledge retention, and self-efficacy of Jordanian nursing students. The experimental group (n = 52) received traditional teaching of BLS (3-hour PowerPoint presentation and demonstration on static manikin in groups of 6 to 7 students) and high-fidelity BLS simulation, while the control group (n = 58) received only traditional

teaching of BLS (3-hour PowerPoint presentation and demonstration on static manikin in groups of 6 to 7 students). Results neither knowledge acquisition nor knowledge retention showed any significant differences between the groups; however, self-efficacy showed significant differences. The study finding revealed that Students trained with high-fidelity simulation achieved higher scores in acquired and retained BLS knowledge and higher self-efficacy perception, indicating the value of simulation in improving knowledge and self-efficacy in nursing students.

Comparison of pretest and post test score regarding knowledge on practice of CPR:

The calculated value‘t’ is 5.57 which is greater than the table value of 0.433 at $p<0.05$. Hence simulation technique is found to be effective in the teaching learning process of CPR.

Alexander, Nevena, Slandana, Nebojsa, Ljiljana[2] Simulation-based learning allows a move from the traditional to the much more integrative approach of using cognitive (perception, thinking, memory, learning), psychomotor (practical, manual skills and techniques, the execution of risky and complex procedures, managing new technology), executive (independent decision-making, building professional opinion) and interpersonal (interview, communication, teamwork) functions. Simulation erases the compromise inherent in balancing education and patient safety in a real clinical environment.

When applied Karl pearson’s correlation coefficient, positive relation was found with age and those who had already performed CPR but without simulation technique.

Figure No.1: "Pretest and posttest score on knowledge on practice of CPR for Adults"

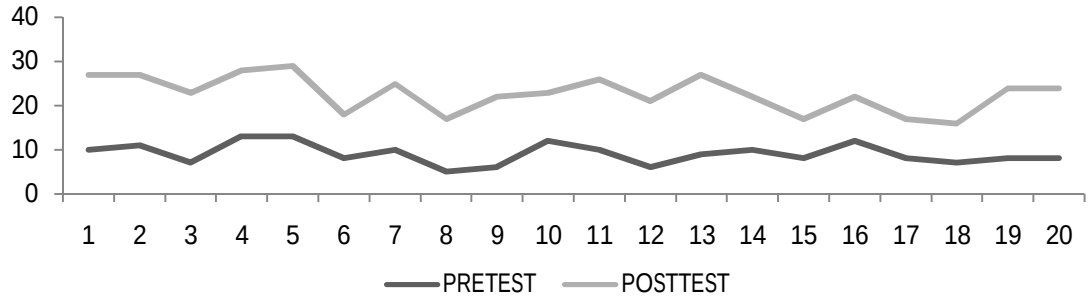
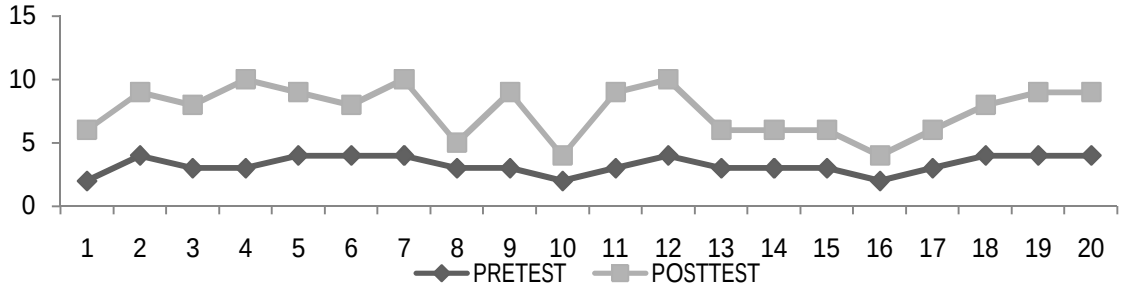


Figure. 2: "Pretest and posttest score on knowledge on practice of CPR for Infant and Children".



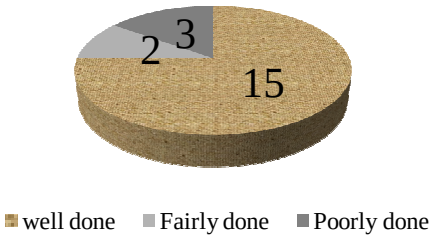


Figure.3: "Practice of CPR among Nursing Students"

Outcome:

The investigators demonstrated CPR to all the students and then allowed them to practice in the simulation lab. They observed their practice and found 15 practiced well and only 3 were poor. Majority of the students followed the correct steps of algorithm and techniques in positioning, breathing and chest compression. But they could keep up the time frame to a certain extent only. Hence their practice of CPR has revealed that simulation is an effective methodology in learning nursing procedures among students. Ried (2008) stated on experience gained from simulation laboratory helps the students get acquainted easily with the real life situation during their clinical postings.

Liberman M,Golberg N Mulder D[8] conducted a comparative study to test out the efficacy of training 102 junior college students in CPR, by trying out four different methods of teaching (Group A 'control', 4 h course, manikin to student ratio 1:4; Group B, 4 h course, manikin to student ratio 1:1; Group C, 2 h course, manikin to student ratio 1:1; Group D, video-assisted CPR instruction, manikin to student ratio 1:1). CPR skills were tested on a computerized manikin at the end of the initial course and again at the end of the semester in order to evaluate short and long-term retention of skills. The most common reasons reported by students for not taking CPR courses were the cost of courses (49.2%) and the inconvenience of courses (26.2%), similarly the two most common incentives which could get students to take CPR courses were; free courses (65.6%) and greater accessibility of courses (54.1%). Video-assisted CPR training appears to be feasible, enjoyable and as, if not more effective than traditional CPR courses. Instituting a mandatory video-assisted CPR program in the curriculum throughout the world, would be a cost-effective way to train massive amounts of young people in CPR .[15]

Inferences:

- Skill oriented nursing procedures may be taught using simulation method.
- Nursing regulatory bodies in India can suggest simulation for practice learning.
- In service education to undergo training in simulation can be arranged for nursing teachers as well as supervisors in the hospitals and community settings.

- ❖ Using simulation technique more studies can be conducted in future with large samples on various other nursing procedures also.

CONCLUSION:

Positive experiences to date in the application of this model of education have opened new vistas to us and paved the way toward plans for the future, including acquiring modern manikins, equipment and software and organizing seminars and conferences.

Simulation technique helps in closing the gap between knowledge and practice of CPR. It has changed the attitude from "DO CPR" to "DO CPR RIGHT". So this technique can be applied in teaching other nursing procedures also. This study concludes that the simulation technique in teaching learning process of CPR is effective.

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REFERENCES:

1. Alinier G, Hunt B, Gordon R, et al. Effectiveness of intermediate-fidelity simulation training technology in undergraduate nursing education. J Adv Nurs. 2006;54(3):359–69.
2. Aleksandar Pavlović, Nevena Kalezić, Slađana Trpković1, Nebojša Videnović, Ljiljana Šulović. The application of simulation in medical education – our experiences “from improvisation to simulation”. Srp Arh Celok Lek. May-Jun 2018;146(5-6):338-344
3. Ricketts B.The role of simulation for learning within pre-registration nursing education - a literature review. Nurse Educ Today. Oct 2011;31(7):650-4. doi: 10.1016/j.nedt.2010.10.029. Epub 2010 Nov 11.
4. Fay-Hillier TM1, Regan RV, Gallagher Gordon M. Communication and patient safety in simulation for mental health nursing education. Issues Ment Health Nurs. Nov 2012;33(11):718-26. doi: 10.3109/01612840.2012.709585.
5. Kevin R. Harris, PhD; David W. Eccles, PhD; Paul Ward, PhD; and James Whyte. A Theoretical Framework for Simulation in Nursing: Answering Schiavenato’s Call. Journal of Nursing Education • Vol. 51, No. X, 2012.
6. Akhu-Zaheya, Laila & Gharaibeh, Muntaha & Alostaz, Ziad. (2013). Effectiveness of Simulation on Knowledge Acquisition, Knowledge Retention, and Self-Efficacy of Nursing Students in Jordan. Clinical Simulation in Nursing. 9. e335–e342. 10.1016/j.ecns.2012.05.001.