The Effectiveness of Demonstration Versus Simulation Method Teaching of CPR on Knowledge among School Students

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Abstract

We introduced systematic training in chest compression-only CPR and automated external defibrillator (AED) use to elementary school students. The questionnaire compared student attitudes towards CPR and their knowledge about it before and after CPR training. To assess the effectiveness of the demonstration method and simulation method among school students. To compare the level of knowledge of demonstration method versus simulation method teaching among school students. A quantitative descriptive study was conducted among school students aged between 14 and 15 years. A self-structured questionnaire' was administered to 60 school students were used as data collection tool. Participants were selected by a simple random sampling technique. The demographic variable father's occupation ($\chi^2=9.714$, p=0.046) had shown a statistically significant association with the level of knowledge on CPR among school students in the demonstration group at p<0.05 level and the other demographic variables had not shown a statistically significant association with the level of knowledge on CPR among school students in the demonstration group. The overall results showed that simulation-based learning (SBL) is a positive, safe and effective method for nursing students in clinical and simulation room settings to improve the skills and practice of client care.

Keywords: Cardiopulmonary Resuscitation, Demonstration, Knowledge, Simulation, Teaching Method.

Introduction

Cardiac arrest (CA) is one of the most common causes of mortality and morbidity throughout the world. The impact on the quality of chest compressions during extended cardiopulmonary resuscitation has yet to be assessed [1]. Evidence shows that despite advocacy to improve CA treatment in recent years, overall survival rates following CA remain low [2]. Immediate initiation of cardiopulmonary resuscitation (CPR) is necessary to preserve and resuscitate the heart and brain [3]. The demonstration method in teaching can be defined as giving a demo or performing a specific activity or concept [4, 5].

Demonstration often occurs when students have a difficult time connecting theories to actual practice or when students are unable to understand the application of theories [6]. Students experience the realism of the scenario and gather meaning from it. A simulation is a form of experiential learning [7, 8]. It is a strategy that fits well with the principles of student-centered and constructivist learning and teaching, [9].

We introduced systematic training in chest compression-only CPR and automated external defibrillator (AED) use to elementary school students. The questionnaire compared student attitudes towards CPR and their knowledge

about it before and after CPR training [10, 11]. We also evaluated parent and teacher views about CPR training in school education. The primary outcome was a positive attitude, defined as "yes" and "maybe yes" on a 5-point Likert-type scale of student attitudes towards CPR. After training, their answers changed to 75.6% and 18.3% for "yes" and "maybe yes", respectively. Many of the students (72.3%, 271/370) who did not have a positive attitude before CPR training had a positive attitude after the training (P < 0.001). Most students understood how to perform CPR (97.7%) and use an AED (98.5%) [12, 13]. This randomized control trial was conducted in 2018-2019. Through purposive sampling, 56 nursing students were selected and randomly assigned to three groups: simulation-based CPR training, CPR training using a serious game on the smartphone platform, and a control group that received no CPR training. Each student was evaluated pre- and post-training on CPR knowledge and skill [14, 15]. To assess the effectiveness of the demonstration method and simulation method among school students. To compare the level of knowledge of the demonstration method versus simulation method teaching among school students CPR is an emergency procedure used to restart a person's heartbeat and breathing after one or both have stopped. It involves giving strong, rapid pushes to the chest to keep blood moving through the body. Usually [16, 18]. It also involves blowing air into the person's mouth to help with breathing and send oxygen to the lungs Assumption. The school students in the selected school may have some knowledge regarding CPR. Demonstration method of teaching may have an impact on student's learning. Simulation-based education methods will stimulate the learning capacity of the students [17]. The use of virtual simulations in Legal Education as a method for learning is relatively rare despite much theoretical support that exists for the benefits of learning [19, 20].

The online course contributed to the learning of basic life support. Given the need for technological innovations in teaching and systematization of cardiopulmonary resuscitation, simulation and feedback devices are resources that favour learning and performance awareness in performing manoeuvres [22]. There will be a significant difference in the interest in demonstration and simulation methods among school students. simulation-based learning (SBL) has been a part of nursing education for the past two decades, though nursing educators are facing difficulties in evaluating its effectiveness in theory and practice [21, 24]. One of the key components of cardiopulmonary resuscitation is effective chest compression (CC). An increasing amount of research is being done on tracking and enhancing CPR performance in real-world and simulated situations. Based on available data, audiovisual feedback devices (AVFs) have the potential to enhance CPR instruction quality and skill retention [25]. Finding more effective ways to teach CPR is crucial to equip future bystanders with the necessary information and abilities [26].

Methods and Material

The methodology of the research study is defined as the way the information is gathered to answer the question or analyze the research problem. It includes aspects like research design, setting of the study, population, and sample, sample size, sample technique, and criteria of the sample selection, scoring interpretation, data collection procedure and data analysis Research Approach; A Quantitative research approach was used in this study to accomplish the objectives framed for the study. Research Design; The research design adopted for this study was quasi-experimental. Research Setting; The study was conducted at Govt higher Secondary school, Virugambakkam, Chennai. Sample: The sample was the 9th school students at

Government Higher Secondary School, Virugambakkam, Chennai. **Sample Size:** The sample size of the study comprises of 60 school students from 9 th standard students. The sample size required 60 including 5% dropouts 65 students were selected. who has fulfilled inclusive criteria? Sampling Technique: The samples were selected by a simple random sampling technique**.**

Result And Discussion

Table 1. Frequency and Percentage Distribution of Level of Knowledge on CPR Among School Students in the Demonstration Group and Simulation Group. N = 60(30+30)

Level of Knowledge	Demonstration Method		Simulation Method	
	F	%	F	%
Inadequate (1 – 8)	10	33.3	3	10.0
Moderate (9 – 16)	15	50.0	18	60.0
Adequate (17 – 25)	5	16.7	9	30.0

The above table 1 shows that among school students in the demonstration method, 15(50%) had moderate knowledge, 19(33.3%) had inadequate knowledge and 5(16.7%) had adequate knowledge. Whereas in the simulation method, 18(60%) had moderate knowledge, 9(30%) in the adequate knowledge and 3(10%) had inadequate knowledge.
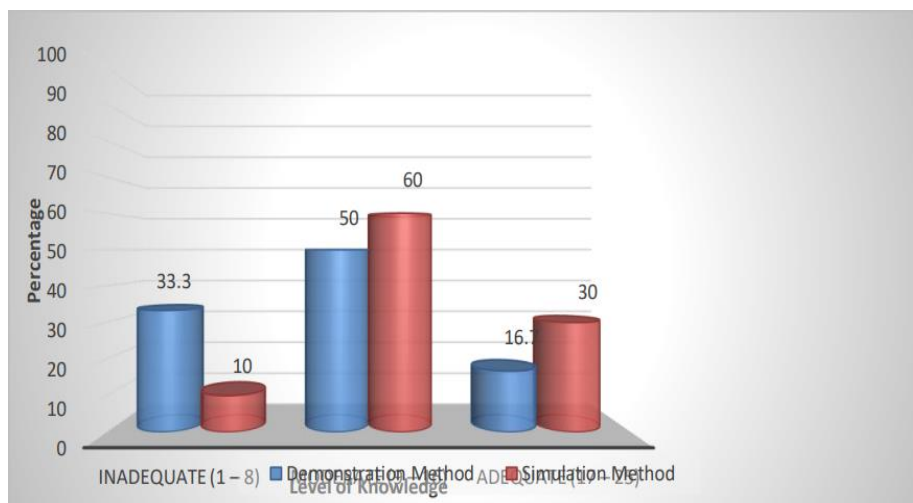

Figure 1. Percentage Distribution of Level of Knowledge on CPR among School Students in the Demonstration Group and Simulation Group

Table 2. Comparison of Demonstration Versus Simulation Method Teaching on Knowledge of CPR among School Students. N = 60(30+30)

Group	Knowledge		Mean Difference score	Student Independent 't' test & p-value
	Mean	S.D		
Demonstration Method	11.20	3.98	4.36	t = 4.161, p=0.0001, S***
Simulation Method	15.56	4.14		

Table 2 depicts that the mean score of knowledge in the demonstration group was 11.20±3.98 and the mean score of knowledge in the simulation group was 15.56±414. The mean difference score was 4.36. The calculated student independent 't' test value of t = 4.161 was statistically significant at p<0.001 level. This clearly shows that the simulation method of teaching imparted to the school students was found to be more effective in improving the level of knowledge on CPR among the school students than the demonstration method of teaching.
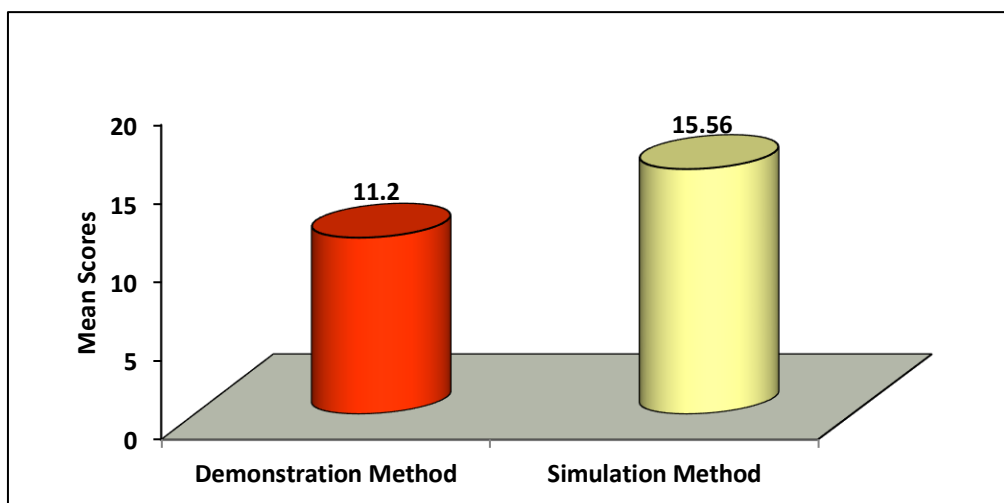

Figure 2. Comparison of Demonstration Versus Simulation Method Teaching on Knowledge of CPR among School Students

Table 3. Association of Level of Knowledge on CPR Among School Students with Selected Demographic Variables in the Demonstration Group. N = 30

Demographic Variables	Demonstration Method		Simulation Method	
	Frequency	Chi-Square Test	Frequency	Chi-Square Test
Age				
14 yrs (boy)	12	χ^2=4.417	9	χ^2=2.778
15 yrs (boy)	3	d.f=6	4	d.f=6
14 yrs (girl)	12	p=0.620	12	p=0.836
15 yrs (girl)	3	.N.S	5	.N.S
Sex		χ^2=5.000	14	χ^2=5.000
Male	12	d.f=2		d.f=2
Female	18	p=0.082 N.S	16	p=0.082 .N.S
Education				
9th standard "A" section	14	χ^2=1.071 d.f=2	15	χ^2=1.429 d.f=2
9th standard "B" section	16	p=0.585 .N.S	15	p=0.490 .N.S
Father's occupation				
Daily wages	14	**χ^2=9.714**	14	χ^2=5.079

Company workers	7	**d.f=4 p=0.046 S***	8	d.f=4 p=0.279
Others	9		8	.N.S
Family income				
5000 – 10,000	8	$\chi^2=6.942$	8	$\chi^2=3.556$
10,000 – 20,000	12	d.f=4 p=0.139	12	d.f=4 p=0.469
Above 20,000	10	N.S	10	N.S
Lifestyle				
Non-vegetarian	25	$\chi^2=2.400$ d.f=2	27	$\chi^2=0.800$ d.f=2
Vegetarian	5	p=0.301 N.S	3	p=0.670 N.S

*p<0.05, S – Significant, N.S – Not Significant

Table 3 shows that the demographic variable father's occupation (χ^2=9.714, p=0.046) had shown a statistically significant association with the level of knowledge on CPR among school students in the demonstration group at p<0.05 level and the other demographic variables had not shown statistically significant association with the level of knowledge on CPR among school students in the demonstration group. The overall results showed that SBL is a positive, safe and effective method for nursing students in clinical and simulation room settings to improve the skills and practice of client care [24].

Delimitations: The study is limited to 9th-class students only. Students present during data collection. Assessment of knowledge and practice will be done only once before the posttest and after given simulation method teaching and demonstration method teaching.

Conclusion

Simulation is an effective teaching strategy that prepares nursing students for real clinical practice. The demographic variables did not show a statistically significant association with the level of knowledge of CPR among school students in the simulation group.

Declaration of Interest

None.

Funding Agency

Nil.

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