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Research Article

Effectiveness of Self-Instructional Strategy and the Traditional Teaching Approach on Nursing Students' Knowledge toward Cardiopulmonary Resuscitation at the College of Nursing in University of Baghdad: Randomized Comparative Trial

MUSAAB MAJID ABDUL-WAHHAB[1*], SABAH ABBAS AHMED[2]
[1] Ph.D. student (instructor, Adult Nursing Department, College of Nursing, University of Baghdad)
[2] Ph.D. (Prof, Adult Nursing Department, College of Nursing, University of Baghdad)
*Corresponding Author
Email ID: musaab@conursing.uobaghdad.edu.iq
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ABSTRACT

Background: Cardiopulmonary resuscitation (CPR) is a technique or procedure that combined chest compression and rescue breathing to maintain enough circulation that prevents brain damage until other essential steps are taken to control the main cause of cardiac and respiratory arrest. The health care personnel should be qualified in the performing of cardiopulmonary resuscitation (CPR) to improve the survival rate of the victims. Therefore; it is necessary to use new methods for learning [1].

Objectives: the study aims to compare the effectiveness of self-instructional teaching strategy and traditional teaching approach on student's knowledge toward cardiopulmonary resuscitation.

Methods: A randomized comparative trial (RCT) design was carried out to compare the effectiveness between two teaching programs; a Traditional teaching method and a self-instructional approach on students' knowledge concerning Cardiopulmonary Resuscitation in the College of Nursing/ University of Baghdad. A sixty student's at the 2nd stage were randomly selected and then assigned into two groups (traditional teaching group and self-instructional group). A statistical package for social science (SPSS) program, version 24 was used for descriptive and inferential statistics.

Results: study results indicated that both teaching methods (traditional teaching& self-instructional records high statistical significant differences ($p \leq 0.001$).added to that the self- instructional strategy (16.9667 ± 4.14) records significant differences in comparison with traditional teaching approach (11.76 ± 4.040).

Conclusions: based on the study results, the study concludes that both teaching methods improve student's knowledge but the self- instructional strategy records higher student's knowledge than traditional teaching.

Keywords: Effectiveness, Cardiopulmonary Resuscitation, Randomized Comparative Trial, Self-Instructional Strategy, Traditional Teaching Approach.

INTRODUCTION

Teaching methods are specific principles and techniques that are used to educate students in a studying environment [2].

The techniques used through an instructor will rely on the abilities or data the instructor would like to deliver to their students. Some of the most frequent teaching strategies are memorization, class participation, recitation, and demonstration. While these instructing strategies are extensively used, each and every teacher has a particular instructing method [3].

Teachers have to be flexible in their techniques and frequently modify their style of education to accommodate their students. Efficient teaching techniques are vital tools that can assist students' gain success in the classroom. Each student has a unique personality and studying abilities. There are different elements that the instructors have to think about when selecting a teaching technique for their students. Some of these elements that are important in choosing a teaching approach consist of the student's abilities and background knowledge, in addition to their environment and interest [4].

Teachers also assist their students to study with various learning aids such as Visual, Kinesthetic (collaborating), and Auditory. Instructors use these teaching strategies to help students apprehend and complete class assignments. The self-instructional method has been raised as a new teaching method for the health care professional in the development their knowledge and practice concerning cardiopulmonary resuscitation in comparison with traditional teaching strategy; it

awakens the trainer desire for learning and put them on a path to be a strategic learner [5].

However, traditional teaching considered a passive learning experience through which the learner taking note from the teacher and try to recall or remember the information when he/she need it in the emergency situation. The external and internal factors like fear, stress, external hazard, and not enough experience in the critical situation may affect negatively the trainer to remember the proper steps of CPR guideline and fail to perform it correctly finally will decrease the survival rate of the critically ill patients [6].

OBJECTIVES OF THE STUDY

The study aims to compare the effectiveness of self-instructional teaching strategy and traditional teaching approach on student's knowledge toward cardiopulmonary resuscitation.

MATERIALS AND METHODS

Design of the Study: A randomized comparative trial (RCT) design was carried out to compare the effectiveness between two teaching programs; a Traditional teaching method and self-instructional approach on students' knowledge, attitudes and practices concerning Cardiopulmonary Resuscitation in the College of Nursing/ University of Baghdad.

Setting of the Study: The present study was carried out in the College of Nursing/ University of Baghdad.

Sample of the study: Simple Random samples were used to select 60 students from the College of Nursing/University of Baghdad. All the students were at the 2nd stage (level), the students assigned into two groups (traditional and self-instructional) with 30 students for each group. The random selection and assignment of the study subject were done to be compatible with the research design.

Study Instrument: Questionnaire was developed to evaluate students'' knowledge related to cardiopulmonary resuscitation. A knowledge questionnaire for students'' was given prior to performing educational program. The knowledge questionnaire for students' was composed of (20) items. All the items of students' knowledge were multiple-choice questions of four choices for each. These rated as (1) for correct choice and (0) for the wrong choice. The time of questionnaire answer list, for each student took about (20-30) minutes. Scores of response are categorized according to the following :

- L (Low student's knowledge) 0.00 – 33.33.
- M (Moderate student's knowledge) 33.33 – 66.66.
- H (High student's knowledge) 66.66 – 100.

Validity and reliability:

To make the instruments more valid, it were presented to a panel of (16) experts in medical fields (9) faculty members from the College of Nursing/University of Baghdad, one faculty member from the College of Health and Medical Technologies/University of Middle Technology, six members from Ministry of Health . They were asked to review questionnaire whether they agreed or disagreed with its contents (items). The results of the experts review revealed that all the questionnaire's items clear and adequate. Minor changes were performed on few items according to the expert's suggestions. Reliability of the questionnaire was used to determine the accuracy of the questionnaire, since the results showed excellent level of stability for the studying phenomena it was calculated by using the major statistical parameter (Alpha Cronbach: 0.9122)

Session of the programs:

Traditional teaching method:

The researcher will use the traditional (one way) lectures to improve the knowledge of nursing students, in which the researcher will explain all the information and data related to cardiopulmonary program. The researcher will allow the students to take note and ask their ambiguous points and questions concerning the program at the end of the lecture to meet the objectives of the lectures.

- **Tools used in the lecture**
- Microsoft power point
- High fidelity simulation
- Ambu bag
- D/C shock
- Oropharyngeal tool
- Endotracheal tube
- Mouth to mouth barrier
- **Time and location of the lecture**:
- Central skill lab/ College of Nursing/ University of Baghdad
- At 8:30 Am

Self-Instruction approach

The researcher will explain the major points and headlines in the lectures and supply the students with enough references (such as: videos, textbook, electronic book and websites). Self- instructional method helps students to read, understand applicate, analyze and evaluate themselves under the supervision and guidance of teacher. The

students will be divided into groups to share information between them and motivate them to get higher scores. The lectures objectives in the self- instructional method will be more specific to help students evaluate themselves when studying.

- Tools used in the lecture
- Textbook, electronic books, websites and videos
- Bloom taxonomy outline
- Studying group
- High fidelity simulation
- D/C shock
- Oropharyngeal tool
- Endotracheal tube and Ambu bag
- Mouth to mouth barrier
- Time and location of the lecture:
- Central skill lab/ College of Nursing/ University of Baghdad
- At 8:30 Am

RESULTS

The demographic characteristics of the students' for traditional teaching method and self-Instructional strategy Indicated that the majority (73.4 %), (70%) of the study subject were males respectively. In relation to the residence; the traditional method group shows that the most students' (53.4%) were at the university dorms while (46.6%) of the students' has a special housing. In comparison to the self- instructional group (56.6%) of the students' at university dorms and only (43.4%) have a special housing. Family income for both groups records less than 300 thousand IQD with (50%) for traditional group and (56.7%) for self-instructional group. (Table 1)

Results show that all student's in both groups (traditional teaching & self-instructional) recorded low knowledge concerning CPR prior to program (pre-test). These results changed positively in the post-test for traditional teaching approach to (13.3%) low knowledge, (50%) moderate knowledge, and (36.7%) high knowledge. While the post-test of Self-Instructional strategy showed that the students' knowledge improved markedly (83.3%) high knowledge students', (10%) with moderate knowledge and (6.7%) low knowledge.(Figure 1&2)

This finding comes along with the study done to "assess the impact of different teaching modalities for pharmacy students in a Cardio-Pulmonary Resuscitation (CPR) course". The questionnaire consists of 20-items to assess students' abilities for understanding the CPR session. The "Statistical Package for Social Science" (SPSS version 13) was used to analyze data. Based on the student's response attained, one way ANOVA was used to find out the difference of the final score among the groups. In this study, Twenty-six students were participating. The questionnaire demonstrates that the final comparison of students' understanding toward CPR were improved (17.2 $\pm$ 2, $p < 0.001$). Students' note-taking at some point of the teaching session and use of chalkboard learning have been found important to enhance the students' remembering and gaining knowledge in the CPR course. Traditional chalkboards instructing strategies significantly increased the students' learning and understanding in the CPR class, consequently improving the students' recalls and understand the idea being explained [7, 8].

Another study mention that adults (between forty and seventy years old) two hundred and forty-three who had no CPR education since 4 years have been "assigned to an untrained control group, Heart saver training, or one of three versions of Video-based self-instructional". Basic CPR skills have been measured by lecturer evaluators' and by way of a high fidelity simulator. "The percentage of subjects who assessed unresponsiveness, called the emergency phone number 911, supplied enough ventilation, desirable hand position, and enough compression depth was significantly improved ($P<0.05$)" for the Video-based self-instructional groups in comparison with controls group. Overall performance and ventilation performance were better in the Video-based self-instructional group than Heart-saver subjects. In this training program; about half an hour were needed to teach the fundamental practices of CPR to the older adults. If properly distributed, the number of CPR responders can significantly improve and increase by this kind of training program [9].

Table (2) demonstrates that highly statistical significant differences were found between pre-test and post-test of Self-Instructional teaching strategy concerning students' knowledge for cardiopulmonary Resuscitation (p-value ≤ 0.05).

A pre-experimental study design was employed, and a simple random sampling method was used to choose 60 participants and to find out the 'effectiveness of self-instructional module (SIM)' in enhancing knowledge of EVD amongst Nigerian students in Bengaluru, India. A pretest was performed with the tool to assess the baseline knowledge of subject after which SIM was administered to all the participants in two episodes. The posttest was performed after 7 days using the identical questionnaire to determine any

improvement in knowledge among the participants. SPSS was used to analyze data at an alpha level of 0.001. The results demonstrate that the majority of average knowledge had been changed positively from (53.3%) to excellent knowledge about Ebola virus after the administration of the SIM (self- instructional module), majority had the mean knowledge of the pretest was 16.03 with an SD of 2.951 while the mean knowledge score of posttest was improved significantly (28.22 with SD of 3.273). The calculated t value was 21.432 ($P < 0.001$). Self- instructional module was very effective to increase subject's knowledge. Health care personnel should adopt this teaching method to improve public health related information [10, 11].

Table (3) demonstrates that the Traditional teaching approach affect positively on the students' knowledge with obvious increase in the mean differences. So there is a highly statistical significance differences were recorded between pretest and posttest concerning students' knowledge.

The posttest comparison between the two teaching methods (Traditional approach & self-Instructional) reveals that highly statistical significant differences were found. The mean differences show that the Self-Instructional strategy was markedly increase students' knowledge in comparison with Traditional teaching method. (Table 4)

A study was conducting on First-year medical students. Students were assigned randomly to join one of three group Heart Code BLS, BLS Anytime and Traditional training. Subject had no prior CPR or HCP training and experience. subject who met the specific criteria were 180 then randomly appointed to three groups 53, 59 and 57 for Heart-Code BLS, traditional group and BLS Anytime group respectively concerning two-person CPR. The study conclude that "the self-directed learning groups not only had a high level of success in initiating the "switch" to two-person CPR, but also better in chest compressions or ventilations between the three groups" [12,13].

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Ethical considerations: all the student's at 2nd stage in the College of nursing/ university of Baghdad were filled the consent sheet before the sampling process.

Financial resources: The authors have no affiliation with any organization with a direct or indirect financial interest in the subject matter discussed in the manuscript.

Conflict of interest: there is no conflict of interest with any organizations or persons

CONCLUSION

Based on the study results, the study conclude that both teaching methods improve student's knowledge but the self- instructional strategy records higher student's knowledge than traditional teaching.

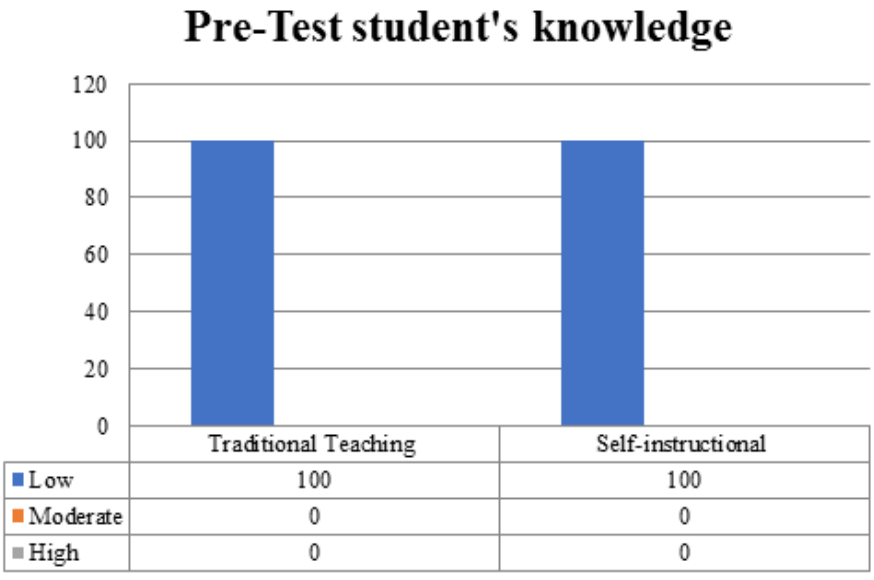

Fig.1: Pre-Test student's knowledge for Traditional and Self-instructional teaching method

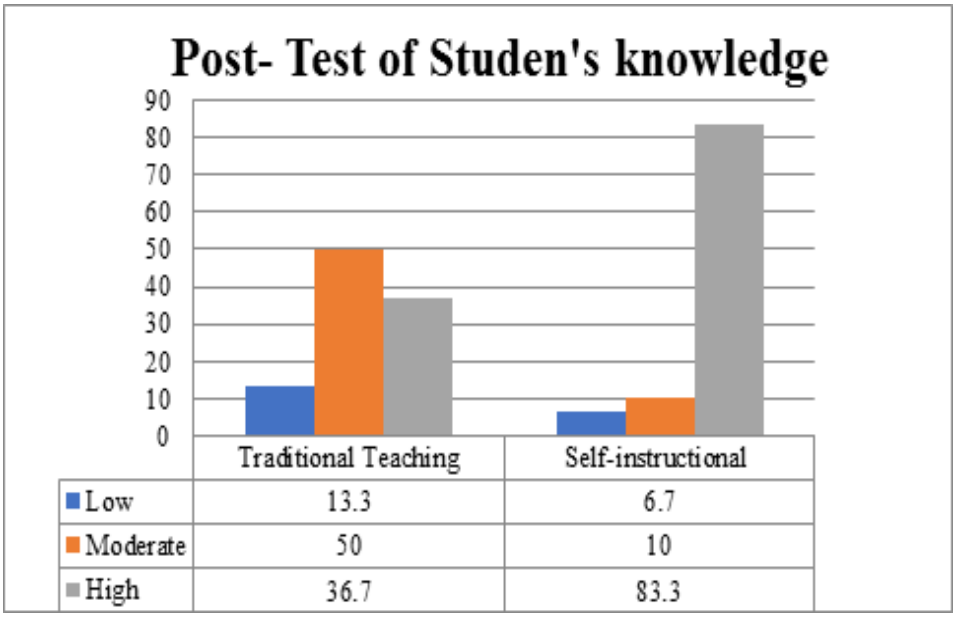

Fig.2: Post-Test for traditional and self-instructional teaching method

Table 1: Socio-Demographic Distribution of Traditional teaching method and self-Instructional strategy

Socio-demographic		Traditional		Self-Instructional	
		F	%	F	%
Gender	Male	8	26.6	9	30
	Female	22	73.4	21	70
	Total	30	100	30	100
Residence	University dorms	16	53.4	17	56.6
	Special	14	46.6	13	43.4
	Total	30	100	30	100
Family monthly income	<300 thous D./M	15	50	17	56.7
	300- 600 thous D/M	10	33.3	9	30
	601-900 thous D/M	5	16.7	4	13.3
	Total	30	100	30	100

F= Frequency, %= percentage

Table 2: Differences between pretest and posttest for Self- Instructional strategy

Paired Samples Statistics				
		Mean	N	Std. Deviation
Pair 1	posttest	16.9667	30	4.14798
	pretest	2.5667	30	2.12835

Paired Samples Test									
		Paired Differences					t	df	Sig. (2tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval Lower	Upper			
Pair 1	posttest - pretest	14.40	4.62825	.84500	12.6717	16.12822	17.04	29	.000

Std: standard, sig: significant, t: paired t test, df: degree of freedom, N: number of subject

Table 3: Differences between Pretest and Posttest of Traditional Approach

Paired Samples Statistics				
		Mean	N	Std. Deviation
Pair 1	posttest	11.7667	30	4.04017
	pretest	2.5333	30	2.19299

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval				
					Lower	Upper			
Pair 1	Posttest-pretest	9.2333	4.24007	.77413	7.65007	10.8166	11.92	29	.000

Std: standard, sig: significant, t: paired t test, df: degree of freedom, N: number of subject

Table 4: Posttest Comparison between Traditional approach and self-Instructional

Group Statistics					
	groups	N	Mean	Std. Deviation	Std. Error Mean
posttest	Traditional	30	11.7667	4.04017	.73763
	Self-Instructional	30	16.9667	4.14798	.75731

Independent Samples Test										
	Levene's Test for Equality of Variances		t-test for Equality of Means							
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference		
								Lower	Upper	
Equal variances assumed	1.967	.166	-4.919	58	.000	-5.20000	1.05718	-7.31617	-3.08383	
Equal variances not assumed			-4.919	57.96	.000	-5.20000	1.05718	-7.31620	-3.08380	

Std.: standard, sig: significant, t: independent t test, df. :degree of freedom, N: number of subject

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