

## To assess the effectiveness of digital Edu system vs Conventional teaching programme on knowledge regarding cardio pulmonary resuscitation among school students - A pre-post study

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**Abstract:** *Introduction:* Cardiopulmonary resuscitation (CPR) is performed in hospitals by emergency response professionals. Bystander CPR can improve survival after out-of-hospital cardiac arrest by 2 to 3 folds. Widespread CPR training is essential to reduce morbidity and mortality rates from out-of-hospital cardiac arrest. There is a need for evaluation of applicability and effectiveness of conventional and Digital methods of instructional strategies to teach CPR skills. *Objective:* To assess which teaching method is more effective, Digital Edu System or conventional teaching to improve knowledge regarding CPR among secondary school Students. *Methodology:* A Pre-post study was conducted among 60 students of IX std, They were divided into two groups of 30 each. Both the groups were given education on CPR using Digital Edu system in one group and conventional teaching programme in another group. The students in both the groups were evaluated three times i.e. Pre-Test, Post- Test, Retention Test using identical pretested structured questionnaire consisting of 22 multiple choice questions. Data analysis was done by using Paired t Test. *Results:* A comparison of mean knowledge score of both groups showed that Conventional Teaching (18.33) was more effective than Digital Teaching (13.37). *Conclusion:* The Results highlight the necessity and effectiveness of face-to-face instructional methods in teaching psychomotor skills of CPR.

**Keywords:** Digital, Conventional, Pre-post study, Teaching Method, CPR.

### Introduction

Cardiopulmonary resuscitation (CPR) is a procedure to support and maintain breathing and circulation for a person who has stopped breathing (respiratory arrest) and/or whose heart has stopped (cardiac arrest) [1]. Sudden cardiac death is a major cause of death in developing countries [2]. Cardiopulmonary resuscitation (CPR) is performed in hospitals by emergency response professionals. Bystander CPR can improve survival after out-of-hospital cardiac arrest by 2 to 3 folds. This can be done by conventional and by digital methods. However Widespread CPR training is essential to reduce morbidity and mortality rates from out-of-hospital cardiac arrest. There is a need for evaluation of applicability and effectiveness of conventional and Digital methods of instructional strategies to teach CPR skills. Cardiopulmonary resuscitation (CPR) is an emergency medical procedure for a victim of cardiac arrest or, in some circumstances, respiratory arrest.

Cardio Pulmonary Resuscitation (CPR) is unlikely to restart the heart; its main purpose is to maintain a flow of oxygenated blood to the brain and the heart, thereby delaying tissue death and extending the brief window of opportunity for a successful resuscitation without permanent brain damage [3]. The teacher use different methods and materials to teach their students and their effective earning [4]. Today, digital technology controls almost every aspect of our life, and lifesaving skills are demonstrated [5]. In Traditional method which is mainly chalk and board, there is more interaction between the teacher and student [6]. Competence-based approach in the system of higher is intended to increase attention to the effective and technological formation of professional competences [7].

To improve the quality of health care, ensure patient safety and increase efficiency, several motivational, interactive learning methodologies, such as realistic simulations,

have been widely discussed, as these methods aim to develop cognitive knowledge, practical skills and the diverse skills relevant to professional activities. A simple and easily accessible CPR training programme might encourage bystander CPR and save lives [8-9]. Hence this study was designed to assess the effects of different instructional methods on the students' knowledge and retention of CPR skills.

**Material and Methods**

This present study was conducted among IX grade students in a central school of Belagavi. Out of 120 students, 60 students were randomly assigned to conventional teaching and digital teaching groups; each having 30 students 30 is considered an ideal number of a single group for conducting any workshop (Todd et al). Ethical approval was taken from Institutional Ethical Committee, JNMC, KAHER, Belagavi, and Karnataka. A total of 60 subjects were randomly included by convenient sampling technique. The study was conducted from March 2017 to December 2017. After obtaining permission from the respective school authorities, participants were briefed about the study. Informed consent was obtained from concerned teachers and parents and assent statement obtained from study subjects. IX standard students were included in the study whereas students who didn't give assent, who were absent and whose

parents/guardian did not give consent were excluded from the study. Data was collected using a predesigned and pretested questionnaire. Pilot study was conducted on 10% of the sample size in a similar secondary school i.e.6 9th standard and necessary modifications made. Both the groups were given education on CPR using Digital Edu system in one group and conventional teaching programme in another group. Students were asked to fill the questionnaire consisting of 11 socio-demographic questions and 22 MCQ's based on CPR. For each MCQ, a score value was assigned, 0 for wrong answer and 1 for correct answer for a total possible score of 24 points.

*Following Operational Definitions were used in the present study:* Digital learning is any type of learning that is facilitated by technology or by instructional practice that makes effective use of technology. Traditional teacher-centered methods focused on rote learning and memorization must be abandoned in favor of student-centered and task-based approaches to learning.

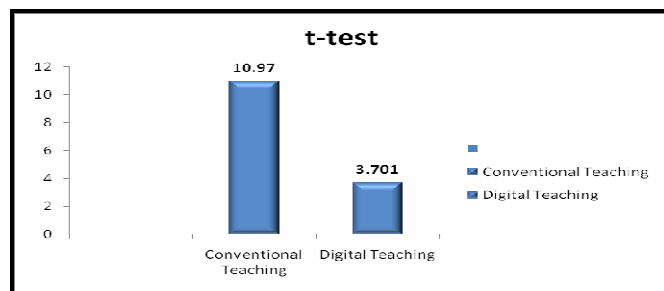
*Statistical Analysis:* Data entry and analyses was done by using the statistical package for social sciences (SPSS) version 20.0. Paired t-test was used to test significance.

**Results**

**Table-1: Data analyzed by t-test**

Group	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig
				Lower	Upper			
Conventional Teaching	7.200	3.595	0.656	8.542	5.858	10.970	29	0.000
Digital Teaching	2.167	3.206	0.585	3.364	0.969	3.701	29	0.001

**Fig-1: Paired Samples Test**



The Students in Conventional group showed better performance than students in the Digital group (Table-1 & Fig-1).

**Table-2: ‘t’ value between Digital and Conventional group students in their performance in CPR Pre Test**

Group	Mean	N	Std. Deviation	Std. Error Mean	‘t’	Sig
Digital Teaching	12.47	30	1.995	0.364	1.012	0.320
Conventional Teaching	11.77	30	2.956	0.54		

**Table-3: ‘t’ value between Digital and Conventional group students in their performance in CPR Post Test**

Group	Mean	N	Std. Deviation	Std. Error Mean	‘t’	Sig
Digital Teaching	14.63	30	2.697	0.492	6.323	0.000
Conventional Teaching	18.97	30	2.47	0.451		

Pretest shows both groups to be alive. There is no significant difference between the scores of digital and conventional group in their knowledge in CPR Pre Test. The obtained ‘t’ value is not statistically significant. Hence the null hypothesis is accepted. It is therefore included that both Digital and conventional group students have the same level of performance in the CPR Pre Test (Table-2).

There is significant difference between the digital and conventional group in their performance in CPR Post Test. The obtained ‘t’ value is statistically significant. Hence the null hypothesis is rejected. It is therefore concluded that conventional group students performed

significantly in CPR Posttest than that of digital group students (Table-3).

There is significant difference between the digital and conventional group in their performance in CPR Retention Test. The obtained ‘t’ value is statistically significant. Hence the null hypothesis is rejected. It is therefore concluded that conventional group students performed significantly in CPR Retention test than that of digital group students. However it is observed that there is not much of a difference between the scores of Post and Retention Test among both the digital and conventional group (Table-4).

**Table-4: ‘t’ value between Digital and Conventional group students in their performance in CPR Retention Test**

Group	Mean	N	Std. Deviation	Std. Error Mean	‘t’	Sig
Digital Teaching	13.37	30	3.548	0.648	6.457	0.000
Conventional Teaching	18.33	30	2.087	0.381		

**Discussion**

The aim of this study was to compare the impact of digital and conventional methods in teaching CPR skills on the knowledge 9<sup>th</sup>std students. There have been many studies investigating the effectiveness of various instructional methods in teaching CPR skills. Video self-instruction is one of the popular methods that reach more people in a society by eliminating the necessity of a formal instructor, which was used as a self-learning tool in web-based instruction group, was suggested to be effective for teaching CPR [10-13]. Also, the case-based method, in which real life emergency situation or event was used in a story format to represent the context, has been used effectively in

the area of medicine including emergency first aid [14-16]. Recent studies related with the video self-instruction, supported the advantages and effectiveness of this method on improvement of CPR skills [14, 16]. However, the present study confirmed that video self-instruction method (Digital method) resulted in lower CPR performance compared to traditional (Conventional method) case-based instructional methods.

Psychological factors play a crucial role in CPR training [16]. Readiness, participation, and relevance are important predictors of motivation and these predictors should be

considered before training people in CPR skills. The instructor's role for motivation, enthusiasm, and feedback in CPR training is critical [17]. Students in the traditional groups (Conventional group) were trained by hands on practice and given a verbal reinforcement by the instructor; however, the students in the web-based instruction group (Digital group) were not trained by the instructor on CPR skills using Manikin [18]. There was no interaction between the instructor and students in Digital group which may have affected their knowledge retention.

Teachers are moving from traditional teaching to digital content delivered to them in ready-to-use formats to wanting easily customizable digital content that they are able to edit and modify. Digital content can have a positive impact on students various skills. Using digital content enhances lessons and improves learning experiences. However in contrast to the above study it was found that Conventional teaching method was better than Digital Method for understanding the CPR skills and retention of the knowledge.

### Conclusion

These findings highlight the necessity and effectiveness of face-to-face instructional methods in teaching psychomotor skills of CPR. Although self-learning methods are considered to be useful to teach CPR, researchers should be aware of the importance of the instructor's feedback, motivating attitude and expertise for

answering student questions related with the emergency conditions. It does not matter whether lectures prefer digital or conventional teaching methods the important aspect is choosing a style that is appropriate for the particular course. The effective lecturers are those who start at a point where the learners can comprehend and lead them step-by-step through the new material, and that that is far more important than the medium used. There are always improvements one can make to style and delivery of presentation, and any slight differences observed in this study between Digital and Conventional presentations are most likely due to lecturers, good preparation, presentation skills and the ability of the course to motivate and create enthusiasm for learning among students.

### Limitation

Due to limitation of time and research budget, the sample of the study was taken from only one school of Belagavi and the Sample size was 60.

### Recommendation

It may be necessary for further research to be conducted to compare the effectiveness of digital teaching and traditional teaching to academic achievement with increased number of school and sample size, pair matching with more than one variable for broad generalization.

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