Effectiveness of Cardiopulmonary Resuscitation (CPR) Training among Youth: A Pre and Post Intervention Study

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KEYWORDS

Knowledge, CPR, Skill among youth, Lifesaving technique

ABSTRACT

Cardiopulmonary Resuscitation (CPR) is one of important First Aid. It can defined as the immediate treatment necessary for the purpose of preserving and minimizing the cardiac arrest until expert medical assistance can arrived. It also includes the initial treatment of cardiac arrest which will need treatment by a medical practitioner. CPR is essential mainly to save by prompt and initial action; preventing the brain death from becoming wo and helping recovery through reassurance and protection from further dang Aim of the study is to evaluate the existing knowledge among youth regard cardiac CPR techniques. Thestudy conducted by using the quantitat research approach andquasi experimental one group pre and post test desig assess the level of knowledge on CPRamong youth. The collected data v organized, tabulated, analyzed and interpreted by using descriptive a inferentialstatistics based on the objectives of the study.Regarding pre scores of 300 respondents 238(79.3%) had poor knowledge, 61(20.3%) h average knowledge, 1(4%) had good knowledge. Regarding post test scores 300 respondents 30(10%) had average knowledge, 270(90%) had go knowledge. The Pre test Mean Score was observed as 1.21 were as Post t Mean Score is 2.90. The Pre test Standard deviation was observed as 0.4 were as Post test Standard deviation is 0.301 Up on applying the Paired sam t-test the T-value -56.530 was observed that to be significant at P<000 le

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INTRODUCTION

Cardiopulmonary Resuscitation (CPR) is a crucial life-saving skill that can be instrumental in emergencies. However, there is a gap in the training of CPR skills among the youth, both girls and boys. This research proposal aims to design, implement, and evaluate a comprehensive CPR training program tailored for youth to empower them with life-saving skills.

Cardiac Arrest or Sudden Cardiac Death remains the single most common cause of death in Worldwide. Roughly around 300,000 patients have cardiac arrest every year in US alone. In India, it is estimated that around 7 lakh deaths occur due to cardiac arrest annually with 85% of them occurring outside hospital settings. Only 1 out of every 10 such patients reaches the hospital,

while the others die at the scene or before reaching the hospital. With proper first aid, on-site resuscitation, and timely referral with continued care, the mortality rate due to sudden Cardiac Arrest can be reduced by up to 60%.

CPR skills are of paramount importance in saving lives during cardiac emergencies. Cardiac Arrest is a critical condition where the heart suddenly stops beating, and immediate intervention is crucial to prevent irreversible damage to Vital Organs and ultimately death. CPR is essential for the following reasons: Immediate Response**:** CPR provides an immediate response in the crucial moments following a cardiac arrest. The first few minutes are often decisive, and the initiation of CPR can significantly increase the chances of survival. CPR involves chest compressions that manually pump blood to vital organs, including the brain and heart. This sustains circulation until professional medical help arrives. By combining chest compressions with rescue breaths, CPR helps supply oxygen to the brain, preventing brain damage. The brain is particularly sensitive to oxygen deprivation, and timely CPR can make a substantial difference. In cases of sudden Cardiac Arrest caused by Ventricular Fibrillation, Defibrillation is often required to restore the Heart's Normal Rhythm. CPR buys time for the arrival of Automated External Defibrillators (AEDs) or Emergency Medical Services equipped with Defibrillators.Studies consistently show that prompt and effective CPR significantly increases the likely hood of survival after cardiac arrest. By Standard training in CPR can play a critical role in bridging the gap until Professional Medical Assistance Arrive. With this back drop, the study has been carried out with the following objectives:

Objectives of the study:

1. To assess the baseline knowledge, attitudes, and skills of youth regarding cardiopulmonary resuscitation (CPR) before the intervention.
2. To equip youth with essential knowledge and practical skills in cardiopulmonary resuscitation (CPR) through hands-on training.
3. To evaluate the effectiveness of intervention regarding CPR-related knowledge and readiness of youth to respond to cardiac emergencies.

Methods and Materials:

The Research Approach and Design adopted for the study were evaluative research approach and one group pre and post-test design respectively. The study was conducted among 300 youth. Initially, a list of interested students willing to participate in the study was collected from three institutions namely Sri PadmavatiMahilaVisvavidyalayam (SPMVV), S.V Arts College, and National Sanskrit University in Tirupati District. These Institutions were purposely selected to represent different Educational contexts. SPMVV, an Exclusive Women's University; SV Arts College, a Co-educational Institutions with Undergraduate Students and National Sanskrit University, a Specialized institution focused on Sanskrit Studies. From the list of 100 respondents from each institution were randomly selected by using lottery method. Since the intention of the study was to raise awareness of essential skills, respondents were given a choice to participate. The effectiveness of the intervention has been analyzed based on their engagement and outcomes.
Tool : A Semi Structured Questionnaire was prepared based on the review of literature, investigator's present experience and in consultation with the subject experts. The Questionnaire was divided into two parts: Part I consist of Demographic details includes Age, Gender, Class, Stream of the study, and previous knowledge of CPR etc. Part II of the tool consisting of 15 items to Assess knowledge of the respondents regarding CPR.

Score Interpretation:

S.No	Score Interpretation	
1	Poor	1-5
2	Average	6-10
3	Good	11-15

Collection of Data

Among the participants, 180 (60%) were females, while the remaining 120 (40%) were males. Initially pre-test was done to assess their knowledge and skills regarding CPR among youth by using questionnaire and observational checklist respectively. Youth were not able to answer regarding CPR and perform the steps correctly. Based on the findings of the baseline data, a customized skill training program was administered with the help of trained doctors using a mannequin. Care was taken to ensure that every individual had the opportunity to practice on the mannequin. The intervention included a combination of visual and practical sessions, along with lectures. After intervention Post-test was conducted by using the same knowledge questionnaire. Statistical analysis was done by using frequency and percentage distribution, mean, standard deviation, paired t-test and chai square.

Statistical Analysis: Data entry was done by using a compatible personal computer and content of the tool was analyzed, categorized and then coded. After data collection, it was revised, coded, and fed toStatistical Software (SPSS) .All the Statistical Analysis was done byusing paired t-test and value at**.000** is considered to be significant.

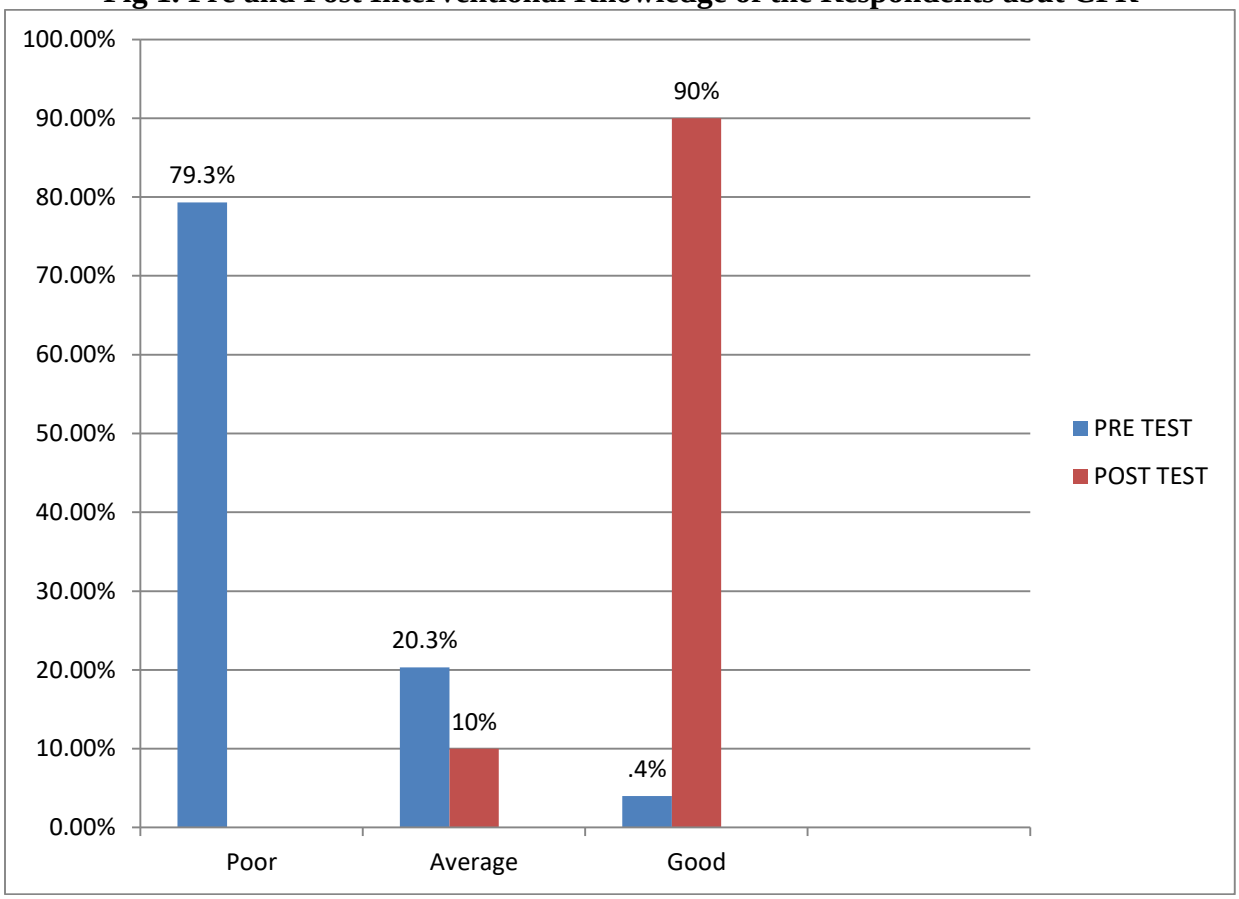
Results and Discussion

Table -1: Frequency and Percentage Distribution of Effectiveness of CPR Training among youth N=300

Level of knowledge	Pre test		Post test	
	Frequency	Percentage	Frequency	Percentage
Poor	238	79.3	-	-
Average	61	20.3	30	10.0
Good	1	.4	270	90.0
Total	300	100.0	300	100.0

The data in table 1 highlights the pretest and posttest knowledge levels of the 300 respondents. The data revels thatAbove table shows thatmajority (79.3) respondents, had poor knowledge of CPR techniques. Followed by 61 respondents (20.3%), exhibited average knowledge, while only 1 respondent (0.4%) displayed good knowledge in the pre intervention. Post intervention data indicates a substantial positive impact of the training program on the participants' knowledge as 90 percent achieved good knowledge.

Fig 1. Pre and Post Interventional Knowledge of the Respondents abut CPR



The study highlights the effectiveness of CPR training program in enhancing knowledge and skills among youth. The results showed a dramatic shift in knowledge levels, with the majority of participants transitioning from poor to good knowledge after the training. This aligns with prior studies emphasizing the role of hands-on- Training and Demonstrations in improving CPR competency. The findings underscore the need for regular CPR training program in educational institutions and community settings to build a cadre of youth equipped with lifesaving skills.

Table 2- MEAN COMPARISION TABLE

S. No	ITEMS	CPR PRE TEST		CPR POST TEST	
		MEAN	SD	MEAN	SD
1	What do the letters CPR stands for?	2.99	0.115	3.00	0.000
2	What is the order of giving CPR?	2.59	1.039	1.23	0.679
3	Which function is restored immediately after giving CPR?	2.45	1.104	3.88	0.506
4	When will you check the response of the victim?	2.67	0.839	1.28	0.768
5	How will you check the response of the victim?	2.69	1.022	1.18	0.620
6	What is to be done before starting compression?	2.63	1.124	2.12	0.419
7	What is the rate of the compression you need to achieve in one minute of CPR?	2.03	0.964	2.18	1.717
8	What is the optimum depth of chest compressions in adults?	2.72	0.883	1.29	0.797
9	How many breaths per minute to be given in a mouth to mouth respirations?	3.08	1.111	1.32	0.856
10	What is the ratio of chest compressions to mouth to mouth respirations?	3.47	0.574	1.36	0.872
11	How to check for effectiveness of chest compressions ?	3.04	1.169	1.30	0.782
12	The chest compression land mark on adult is?	3.06	0.863	1.36	0.860
13	When is it acceptable to stop CPR?	3.79	0.406	3.83	0.539
14	The device AED means?	2.69	1.069	1.37	0.838
15	How do you know the victim is receiving adequate breaths during Cardiopulmonary Resuscitation?	1.19	0.644	1.16	0.560
	CPR OVERALL SCORE	1.21	0.416	2.90	0.301

Table 3- PAIRED SAMPLE TEST

S. No	ITEMS	Paired Differences		t	Df	Sig. (2-tailed)
		Pre & Post Mean	SD			
1	What do the letters CPR stands for?	-.007	.115	-1.000	299	.318
2	What is the order of giving CPR?	1.357	1.258	18.686	299	**.000**
3	Which function is restored immediately after giving CPR?	-1.427	1.190	-20.766	299	**.000**
4	When will you check the response of the victim?	1.387	1.102	21.794	299	**.000**
5	How will you check the response of the victim?	1.503	1.170	22.263	299	**.000**
6	What is to be done before starting compression?	.510	1.195	7.392	299	**.000**
7	What is the rate of the compression you need to achieve in one minute of CPR?	-.143	2.019	-1.230	299	.220
8	What is the optimum depth of chest compressions in adults?	1.427	1.159	21.327	299	**.000**
9	How many breaths per minute to be given in a mouth to mouth respirations?	1.767	1.483	20.632	299	**.000**
10	What is the ratio of chest compressions to mouth to mouth respirations?	2.107	.989	36.886	299	**.000**
11	How to check for effectiveness of chest compressions ?	1.737	1.400	21.483	299	**.000**
12	The chest compression land mark on adult is?	1.697	1.248	23.555	299	**.000**
13	When is it acceptable to stop CPR?	-.033	.708	-.816	299	.415
14	The device AED means?	1.320	1.355	16.868	299	**.000**
15	How do you know the victim is receiving adequate breaths during Cardiopulmonary Resuscitation?	.033	.817	.707	299	.480
	Pre and Post CPR Score	**-1.690**	**.518**	**-56.530**	**299**	**.000**

The above tables show the mean scores of knowledge among youth regarding CPR training program before and after intervention. The pre and post test Mean was-1.690where as pre and posttest SD was.518 respectivelyand Paired t –test value was 56.530 . Which shows that

CPR training programme was more effective at the level of P<.000 among youth after intervention.

Table 4-Comparison of Mean and Standard Deviation of CPR Training among Youth After Intervention.

N=300

S.no	Group	Mean	Standard deviation	t- Value	Df	Sig. (2-tailed
1	Pre test	1.21	0.416	-56.530	299	.000
2	Post test	2.90	0.301			

The Pre Mean Score was observed as**1.21** and Post Mean Score was**2.90.**The Pre Standard deviation was observed as **0.416** were as Post Standard deviation was**0.301**. On applying the Paired t-test the t-value **-56.530** was observed that to be significant at **P<.000**. It indicates that there was Effectiveness in Training Programme on CPR among Youth..

Conclusion:

The study underscores the effectiveness of tailored and customized interventions in bringing about the desired change. The CPR training program significantly enhanced the knowledge and skills of the youth, as evidenced by the shift from predominantly poor knowledge in the pretest to good knowledge in the posttest for 90% of participants. This highlights the critical role of well-structured, hands-on training programs in equipping individuals with essential life-saving skills. Effective and customized interventions can undoubtedly drive meaningful and impactful change, preparing youth to respond confidently to cardiac emergencies.

Recommendations

1. CPR training can be made mandatory for students in schools and colleges to respond to emergencies
2. Regular refresher courses are necessary to ensure skill retention.
3. Extend CPR training initiatives beyond schools and colleges to reach youth in rural and underserved areas, ensuring equitable access to lifesaving skills
4. Further studies should explore long-term retention of CPR knowledge and skills.

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References

1. Aromataris, E. & Pearson, A., 2014, 'The systematic review: Anoverview', AJN TheAmerican Journal of Nursing 114(3), 53–58.

10.1097/01.NAJ.0000444496.24228.2c [PubMed] [CrossRef] [Google Scholar]

2.Barsom,E.Z.,Duijm,R.D.,DusseljeePeute,L.W.P.,LandmanVanDeBoom,E.B., et al.., 2020, 'Cardiopulmonary resuscitationtraining for high school students using an immersive 360-degree virtual realityenvironment', British Journal ofEducational Technology51(6), 2050–2062.

10.1111/bjet.13025 [CrossRef] [GoogleScholar]

3. Benjamin EJ, Virani SS, Callaway CW, et al. Heart disease and strokestatistics-2018 update: are port from the American Heart Association Circulation.2018;137:e67–e492.doi:

4.Cave,D.M.,Aufderheide,T.P.,Beeson,J.,Ellison,A.,Gregory,A.,Hazinski,M.F.etal.2011,'Importa nce and implementation of training in cardio pulmonaryresuscitation and automated external defibrillation in schools: A science advisoryfrom the American HeartAssociation',Circulation123(6),691–706.10.1161/CIR.0b013e31820b5328

5. Fernandis AM. A Quasi Experimental Study to Assess The Effectiveness ofSkill Training Programme on Knowledge And Skills Of cardio PulmonaryResuscitation Among Adolescents In Selected Higher Secondary School ofMaharashtra. Indian J Nurse Sci. 2023; 8 (1):10-14.

6. Keshava Murthy M R, Aruna C Ramesh. A study of relationship betweeneffective CPR training, physical characteristics of resuscitator and chestcompression quality. Med Pulse International Journal of Anesthesiology.November 2019; 12(2): 93-97.http://medpulse.in/Anesthsiology/index.php

7. Sasson C, Rogers MA, DahlJ, Kellermann AL. Predictors of survival from out-of-hospital cardiac arrest: a systematic review and meta-analysis. Cardiovascular Outcomes. 2010; 3:63–81doi: 10.1161/CIRCOUTCOMES.109.889576LinkGoogle Scholar

8. Tanna D, Bose N, Chandnani A. Effectiveness of short duration of CPRtraining based on Indian guidelines among the doctors of a tertiary care teachinghospital in Western India-An interventional study. Indian J Clin Anaesth2019;6(2):194-7