A Study to Assess the Effect of Cardiopulmonary Resuscitation (CPR) Education on CPR Knowledge, Attitudes, Self-Efficacy, and Confidence in Performing CPR among Selected School Students in the Mehsana District

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ABSTRACT

Recently, there has been a significant increase in the number of cardiac arrests (CA) worldwide, making it a major public health issue. Cardiopulmonary resuscitation (CPR) plays a key role in circulating blood and delaying brain damage. The survival rate of CA was more than three times higher when bystander CPR was conducted compared to individuals who did not receive CPR.

Cardiopulmonary Resuscitation (CPR) education for school students is emphasized, as bystander CPR is a vital for enhancing the survival rate and neurological outcome of Out-of-hospital cardiac arrest (OHCA) victims. This study was conducted to assess the effect of CPR education on CPR knowledge, attitudes, self-efficacy and confidence in performing CPR among school students. In this study design were selected Pretest Post test design including CPR education with 200 school students at selected school mainly 11th grade, 12th grade and different stream. Data were collected through structured questionnaires before and after CPR education and analysed using descriptive statistics and T-test and regression. The results of this study that positive effect of CPR education on school students. Significant improvements in CPR knowledge, attitudes, self-efficacy and confidence in performing CPR found after CPR education, the influence factor on confidence in performing CPR were school grade, gender, stream, attitude and self-efficacy. Although a significant increase in school students CPR knowledge after education was shown and it leads positive attitude. In conclusion CPR should be provided for school students in order to increase the rate of bystander CPR for OHCA victims.

Key words: Cardiopulmonary resuscitation, Knowledge, attitude, self-efficacy, Confidence and school students

INTRODUCTION

Recently, there has been a significant increase in the global incidence of cardiac arrests (CA), cementing it as a critical priority for public health networks worldwide. During a cardiac event, immediate cardiopulmonary resuscitation (CPR) is essential to preserve systemic blood circulation and delay irreversible neurological or brain damage. Prior clinical literature demonstrates that the survival rate of cardiac arrest victims is more than three times higher when bystander CPR is initiated promptly compared to cases where intervention is delayed until emergency medical services arrive.

Implementing CPR education for school-aged students has emerged as a crucial global strategy. Because out-of-hospital cardiac arrests (OHCA) frequently occur in community settings, preparing younger demographics maximizes the potential pool of capable bystanders. Epidemiological models indicate that at least 15% of a population must be proficient in CPR to yield a statistically significant uptick in community survival rates. Relying solely on voluntary community public health campaigns has proven insufficient to hit this threshold. Consequently, introducing mandatory education within school systems presents a scalable and sustainable alternative that fosters long-term behavioral changes across generations.

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To bridge this gap, the American Heart Association (AHA) recommends integrating at least 2 hours of CPR education annually into school curricula. Despite this guideline, debates persist regarding the optimal target age to introduce training. Adolescents have demonstrated excellent retention of both theoretical knowledge and psychomotor skills, regularly passing these lifesaving techniques on to family networks and peers. Beyond cognitive and physical proficiency, early exposure to CPR training improves student attitudes, empathy, civic responsibility, intentions to assist strangers, and personal self-efficacy.

While multiple global studies explore school-based CPR training, minimal research explicitly traces the multi-variable factors that influence an adolescent's psychological confidence to execute bystander CPR in a crisis. This study was established to evaluate the direct impact of structured CPR training on knowledge, attitude, self-efficacy, and confidence, while systematically identifying the key variables that influence a student's confidence to act.

Statement Of the Problem

A study to assess the effect of Cardiopulmonary Resuscitation (CPR) Education on CPR Knowledge, Attitudes, Self-Efficacy, and Confidence in Performing CPR among selected School Students in the Mehsana district.

Objectives

1. To assess the CPR knowledge, attitude, self-efficacy and confidence in performing CPR
2. To assess the effectiveness of CPR education on CPR knowledge, attitude, self-efficacy and confidence in performing CPR
3. To find out the association between CPR knowledge, attitude, self-efficacy and confidence in performing CPR with their selected demographic variables.
4. To find out the correlation between CPR knowledge, attitude, self-efficacy and confidence in performing CPR

RESEARCH DESIGN & METHODOLOGY

Research Design and Setting

This study utilized a quantitative, quasi-experimental pre-test, post-test design. The intervention was deployed among high school students studying in selected schools within the Mehsana district of Gujarat, India.

Sample and Sampling Technique

A sample of 200 school students was selected using a convenient sampling technique based on institutional accessibility and administrative clearance.

Instruments And Data Collection Tools

Data collection relied on four distinct psychometric and cognitive measurement scales:

General Demographic Characteristics: Captured self-reported profiles including gender, school grade, academic stream, frequency of past CPR training, and time elapsed since their last CPR session.

CPR Knowledge Questionnaire: Comprised 8 objective items evaluating fundamental theoretical knowledge. The tool was modified to align with the 2020 American Heart Association (AHA) guidelines for basic life support. Scoring used a binary format: correct responses earned 1 point, while incorrect answers received 0.

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Attitude Towards CPR Scale: Measured personal perceptions and willingness to perform resuscitation using 10 items scored on a 5-point Likert scale (5 = Strongly Agree, 4 = Agree, 3 = Average, 2 = Disagree, 1 = Strongly Disagree). Negatively phrased questions were reverse-scored prior to analysis.

Self-Efficacy for CPR Scale: Assessed self-judgments regarding personal capabilities to execute CPR steps. This metric featured 10 items formatted with the same 5-point Likert configuration as the attitude scale.

Confidence in Performing CPR Checklist: Evaluated situational assertiveness using 4 target questions on a binary ("Yes" = 1, "No" = 0) checklist. Total cumulative scores ranged from 0 to 4, where higher scores signified higher situational confidence.

RESULTS

Demographic Profile of Participants

The final sample consisted of 200 students. Males represented a slight majority with 102 participants (51.4%). Representation was evenly distributed between 11th and 12th-grade cohorts. Academically, the science stream accounted for the largest segment at 72 students (36.7%). Regarding prior exposure, 64 students (32%) reported having undergone at least one prior CPR training session, whereas only 20 participants (10%) indicated having absolutely no prior familiarity with the procedure.

Impact of CPR Education on Key Variables

Paired sample testing revealed distinct improvements across all measured domains from pre-test to post-test:

Table 1: Domain Comparison Before and After CPR Education (N=200)

Variables	Pre-Education Mean	Post-Education Mean	t-value	p-value
CPR Knowledge	4.40	5.01	2.70	0.008*
Attitude towards CPR	3.60	3.78	2.43	0.017*
Self-efficacy for CPR	3.10	3.35	2.45	0.013*
Confidence in Performing CPR	3.10	3.35	7.45	<0.001*

The most substantial relative improvement shifted within the confidence domain, demonstrating a highly significant statistical change ($t = 7.45$, $p < 0.001$).

Item-Wise Confidence Shifts

To map specific behavioural intentions, itemized analyses of the confidence checklist were cross-tabulated using Pearson Chi-Square tests:

Table 2: Item-wise Analysis of Confidence Questions

Item Question	Pre-Test n (%)	Post-Test n (%)	$\chi 2$	p-value
1. Can you perform CPR if you find a cardiac arrest patient in the absence of medical staff?	120 (60%)	150 (75%)	7.835	0.005
2. Can you perform CPR if your family member experiences a cardiac arrest?	150 (75%)	186 (93%)	18.033	<0.001

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3. Are you confident in performing CPR when you find a cardiac arrest patient in front of you?	80 (40%)	160 (80%)	54.632	<0.001
4. Can you use an AED if you find a cardiac arrest patient in the absence of medical staff?	50 (25%)	80 (40%)	12.987	<0.001

The result showed significant improvements in all questions regarding the participant "confidence in performing CPR"

Hierarchical Regression of Influencing Factors on Confidence in Performing CPR after CPR Education

After CPR education, the factors influencing confidence were school grade ($\beta = 0.213$), attitude toward CPR ($\beta = 0.192$), and self-efficacy for CPR ($\beta = 0.215$), with an explanatory power of 18.0%. This indicates that higher grade, a more positive attitude toward CPR, and higher self-efficacy for CPR were associated with higher confidence.

DISCUSSION

The findings of this study demonstrate that structured CPR education significantly increases knowledge, while shifting attitudes, self-efficacy, and action-oriented confidence among high school students. The marked improvement in post-test mean scores confirms that structured academic interventions effectively prepare laypeople to manage emergencies.

Our analysis underscores that confidence is not driven solely by theoretical knowledge. The hierarchical regression model indicates that an individual's confidence to execute CPR is shaped by a combination of mature academic standing (school grade), positive attitude, and underlying psychological self-efficacy. Interestingly, students reported the highest readiness when considering a family member as the recipient (moving from 75% to 93%), validating the concept that emotional proximity lowers hesitation barriers. Conversely, automated external defibrillator (AED) usage confidence, while improved, remained the lowest overall post-test metric (40%). This suggests that future modules must incorporate more hands-on practical exposure with AED trainers to demystify interactive medical technology.

Ultimately, this study confirms that school-based CPR training achieves dual goals: it builds important medical skills and reinforces concepts of civic duty, self-worth, and moral responsibility among young citizens.

Limitations

The use of a non-probability convenience sampling technique restricted to a single district limits broader generalization across diverse populations.

Psychomotor skill acquisition was not evaluated using practical check-offs or high-fidelity mannequins, relying instead on self-reported confidence and knowledge scales.

CONCLUSION

This study demonstrates that targeted educational programs significantly improve CPR knowledge, attitudes, self-efficacy, and confidence among school students. Beyond improving cognitive retention, the intervention enhanced students' sense of moral responsibility and willingness to act during emergencies. School grade, academic stream, pre-existing attitudes, and self-efficacy are foundational pillars that dictate ultimate situational confidence.

RECOMMENDATIONS FOR FUTURE RESEARCH

Sample Scalability: Replicate this research across a larger, randomly selected geographical sample to enhance generalizability.

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Skill Assessment: Incorporate direct psychomotor skill assessments using objective structured clinical examinations (OSCEs) and real-time feedback mannequins.

Diverse Settings: Conduct comparative evaluations across diverse school environments, including rural versus urban institutions.

Age Diversification: Evaluate the pedagogical impact of introductory basic life support training among younger age cohorts, such as elementary or middle school students.

Methodological Variations: Utilize randomized controlled trials (RCTs) comparing digital simulation-based training against traditional blended learning methods.

Funding

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Institutional Review Board Statement

The study was conducted in accordance with the Declaration of Ganpat University- Kumud & Bhupesh Institute of Nursing and approved by the Institutional Review Board of Ganpat University

Informed Consent Statement

Informed consent was obtained from all students.

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Conflicts Of Interest

The authors declare no conflict of interest.

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