



**EFFECTIVENESS OF DEMONSTRATION METHOD ON KNOWLEDGE
AND SKILL REGARDING CARDIOPULMONARY RESUSCITATION
AMONG STUDENTS OF SANSKAR EDUCATIONAL TRUST, PIPARIA,
VADODARA, GUJARAT**

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ABSTRACT

Background: Cardiac arrest is a critical medical emergency characterized by the cessation of an effective pulse and the failure to circulate blood, leading to loss of consciousness and the absence of a pulse and blood pressure. It often results in high mortality rates but can be preventable through simple maneuvers and acquired skills, making it a key strategy in reducing cardiac arrest-related mortality. **Aim:** This study aimed to assess the impact of demonstrating cardiopulmonary resuscitation (CPR) on students at Sanskar Educational Trust. **Material And Method:** A pre-experimental study was conducted with 60 students, employing non-probability purposive sampling. A structured questionnaire was used to evaluate their knowledge and skills in CPR, utilizing both descriptive and inferential statistics. **Result:** The results revealed a significant enhancement in knowledge and skills among the students following the CPR demonstration, as evidenced by the p-value, affirming the effectiveness of the demonstration in improving their CPR-related knowledge and skills. **Conclusion:** this study underscores the significance of effective CPR demonstrations in improving preparedness for cardiac arrest situations.

Keywords: Effectiveness, demonstration, knowledge and skill, students

INTRODUCTION:

The human heart stands as one of the body's most crucial organs, pulsating at an average rate of 72 beats per minute in adults. It tirelessly operates round the clock, seven days a week, with the fundamental responsibility of delivering oxygen-enriched blood to all the various parts of our body. In the event that our heart ceases its rhythmic pumping, vital organs are deprived of oxygen, leading to their cessation of normal function [1].

The heart, a hollow muscular organ approximately 10 cm in size, comparable to the dimensions of a clenched fist, weighs around 225 grams in women and is heavier in men, reaching about 310 grams. However, despite its remarkable nature, the heart is susceptible to cardiac arrest, a common and severe medical emergency. Cardiac arrest occurs when the heart no longer generates an effective pulse, resulting in the failure to circulate blood throughout the body. This condition is characterized by the loss of consciousness and the absence of a detectable pulse and blood pressure. Its often dire consequences, including high mortality rates, can be largely averted through the application of straightforward maneuvers and skills [2].

Coronary artery disease stands as the primary factor behind sudden cardiac arrest, contributing to approximately 60-70% of all sudden cardiac deaths. Other factors that can lead to cardiac arrest include smoking, inadequate physical exercise, obesity,

diabetes, prior heart attacks, and a family history of cardiac diseases. Traditionally, cardiopulmonary resuscitation (CPR) has encompassed the combination of chest compressions and rescue breathing, aimed at optimizing circulatory function and oxygenation. The effectiveness of CPR components may be influenced by the characteristics of both the rescuer and the victim. It's worth noting that anyone has the potential to be a life-saving rescuer in a cardiac arrest scenario. The proficiency and application of CPR skills rely on the rescuer's training, experience, and self-assurance [3].

Chest compressions serve as the fundamental element of CPR. It is imperative that all rescuers, irrespective of their level of training, prioritize delivering chest compressions to every cardiac arrest victim. Recognizing the critical significance of chest compressions, they should be the initial actions taken in CPR for individuals of all age groups. When possible, rescuers should supplement chest compressions with ventilation. In cases where highly trained rescuers collaborate, they should work together to synchronize their efforts and administer both chest compressions and ventilation using a team-based approach, effectively integrating the crucial components of CPR [4].

Estimates indicate that over 7,000,000 individuals succumb to sudden cardiac death annually on a global scale. In India, the yearly

occurrence of sudden cardiac death is reported per 1000 of the population, with a projection suggesting that nearly 2.6 million Indians may fall victim to coronary artery disease-related deaths by the year 2020. The incidence of sudden cardiac deaths is notably elevated among individuals in the age range of 45-75 years, and it is further observed that men experience a higher rate of cardiac arrests compared to females [5].

Having knowledge of Basic Life Support (BLS) and practicing simple CPR techniques plays a pivotal role in ensuring the patient's survival until experienced medical assistance arrives, often proving to be sufficient for survival in many cases. Basic CPR can be administered by well-trained healthcare professionals as well as appropriately trained non-professionals. According to a study presented at the Resuscitation Science Symposium, men are more likely to receive bystander CPR in public settings compared to women. While both women and men receive similar CPR assistance at home, only 39% of women receive bystander CPR in public, compared to 45% of men. The study found that men were 1.23 times more likely to receive bystander CPR in public, and this increased their chances of survival by 23% when compared to women. It is crucial for anyone, including bystanders, to perform high-quality CPR, emphasizing five critical components: minimizing interruptions in chest compressions, delivering compressions

at an adequate rate and depth, avoiding leaning on the victim between compressions, ensuring proper hand placement, and preventing excessive ventilation. Cardiac arrest can occur at any time and in any location, often when healthcare professionals are not immediately accessible. By the time a patient is transported to a hospital, valuable time may have been lost. Having family members knowledgeable in CPR can be a life-saving measure, as only one-third of adults experiencing out-of-hospital cardiac arrest receive timely and appropriate care. The prompt initiation of CPR can significantly increase a victim's chances of survival, potentially doubling or even tripling them. Therefore, it is essential to teach CPR to the general public because they are often the first responders in those crucial minutes before healthcare professionals arrive. The practice of bystander CPR, followed by advanced cardiac life support, has demonstrated its effectiveness in treating out-of-hospital sudden cardiac death, both in terms of improving long-term survival and neurological outcomes for these patients [6]. Research has revealed that in the case of out-of-home cardiac arrests, bystanders, whether laypersons or family members, make attempts to administer CPR only between 14% to 45% of the time, and merely half of these bystanders execute CPR effectively. Notably, when cardiac arrests take place outside the hospital setting, bystanders who are strangers

to the victim are more likely to provide CPR than a member of the victim's own family. This is attributed to the fact that strangers often maintain their composure and clear thinking in contrast to family members. Within the home, only a minority of bystanders initiate CPR when a family member collapses, with the primary reason for their reluctance being the fear of inadequacy or failure. These findings underscore the inadequacy of CPR courses reaching those who are most likely to be called upon to employ this life-saving skill [7].

MATERIAL AND METHODS:

In this research study, a quantitative research approach was adopted with a pre-experimental one group pre-test and post-test design. The study aimed to assess the effectiveness of a demonstration on cardiopulmonary resuscitation (CPR) among students at Sanskar Educational Trust. The research was conducted on a sample of 60 degree students who met the inclusion criteria. The sample size was determined using a single proportion formula, resulting in a minimum sample size of 60. Data were collected through demographic information, a structured questionnaire to assess knowledge regarding CPR, and a checklist to assess CPR skills. The independent variable was the demonstration method, and the dependent variables were knowledge and skill regarding CPR. Data analysis involved descriptive statistics for demographic variables and

inferential statistics, including paired t-tests and chi-square tests. Ethical considerations and feasibility issues were addressed. Ethical clearance was obtained, and consent from participants was also obtained. The data collection procedure involved obtaining permission, enrolling participants, conducting pre-tests, administering the intervention, and conducting post-tests. Data were analyzed based on the study objectives using both descriptive and inferential statistics.

RESULTS:

The demographic variables of the students were analyzed in terms of frequency and percentage distribution

In terms of age, the majority, 35 (58.3%), fell within the 17-19 years age range, followed by 14 (23.3%) in the 23-25 years bracket, 6 (10%) in the 20-22 years category, and 5 (8.3%) were over 20 years old. Regarding gender, the study comprised 36 (60%) female students and 24 (40%) males. In terms of religion, 54 (90%) students identified as Hindu, 4 (6.7%) as Muslim, and 2 (3.3%) as Christian. As for their field of study, 36 (61%) were pursuing a Bachelor of Commerce degree, 14 (23.7%) were in the Bachelor of Education program, and 10 (15.4%) were enrolled in the Bachelor of Arts program. Concerning family history of cardiac disease, 42 (70%) had no reported history, while 18 (30%) indicated a positive family history. In terms of awareness about cardio-pulmonary resuscitation (CPR), 42 (70%) students were

aware of CPR, and 18 (30%) were not. The sources of information about CPR varied, with the majority (26, 43.33%) learning from health personnel, 12 (20%) from mass media, 10 (16.7%) from workshops, 10 (16.7%) from friends, and 2 (3.3%) from neighbors. In the context of recent CPR classes, 20 (33.3%) students had attended classes on CPR within the last 6 months, while 40 (66.7%) had not participated in such classes.

Pre-test levels of knowledge among a sample of 60 students regarding cardio-pulmonary resuscitation (CPR)

The students are categorized into three distinct levels of knowledge: "poor," "average," and "good." Within the "poor knowledge" category, 23 students (38.3%) are identified as having limited or potentially incorrect information about CPR procedures and techniques. Meanwhile, 19 students (31.7%) fall into the "average knowledge" group, indicating a basic grasp of CPR concepts but suggesting a need for further education and training to achieve proficiency. On the other hand, 18 students (30%) are classified under "good knowledge," signifying a strong understanding of CPR principles and a higher level of preparedness to respond effectively in a cardiac arrest scenario. This breakdown highlights the distribution of knowledge levels among the students and underscores the potential importance of CPR education and training to

enhance their capabilities in this life-saving practice.

Pre-test skill levels among 60 students regarding cardio-pulmonary resuscitation (CPR)

Interestingly, all 60 students in the sample are categorized under "poor skills," representing 100% of the group. This indicates that, prior to any training or intervention, none of the students demonstrated a proficient level of CPR skills, highlighting the need for educational efforts and training to improve their CPR competencies.

Evaluates the impact of demonstrating cardiopulmonary resuscitation (CPR) on students' skills, featuring pre-test and post-test data

In the pre-test, the mean CPR skill score was 3.755 with a standard deviation (SD) of 5.9564. However, in the post-test, following the CPR demonstration, the mean skill score saw a significant improvement to 2.433, accompanied by a reduced SD of 2.5143. The mean difference between the pre-test and post-test scores was noteworthy at 11.64, and the SD difference stood at 3.45. The t-value, representing the difference between means relative to data variability, was a substantial 4.877. With 59 degrees of freedom, the t-test effectively compared the means. The p-value, registering at 0.001 and denoted by "S," underscores a statistically significant difference between pre-test and post-test scores. This implies that the CPR

demonstration had a significant positive impact on students' CPR skills, as demonstrated by the lower post-test scores compared to the pre-test scores.

The assessment of post-test levels of knowledge among students regarding cardiopulmonary resuscitation (CPR)

After the post-test, none of the students were categorized under "poor knowledge," signifying a 0.0% representation, while 28 students (46.7%) demonstrated "average knowledge" and 32 students (53.3%) displayed "good knowledge." The statistically significant result ($P < 0.05$) suggests an improvement in knowledge following the CPR demonstration. The assessment of post-test skill levels regarding CPR reveals a noteworthy transformation. None of the students exhibited "poor skills" post-test, representing 0.0%. Instead, all 60 students (100%) showcased "good skills." The significant outcome ($P < 0.05$) highlights a substantial enhancement in CPR skills following the intervention, indicating the effectiveness of the demonstration.

The association between pre-test levels of knowledge regarding cardiopulmonary resuscitation (CPR) and various demographic profiles or characteristics of the students.

The demographic variables examined include age, gender, religion, course of study, family history of cardiac disease, awareness about CPR, source of information regarding CPR,

and attendance in CPR classes within the last 6 months. The results indicate that none of these demographic factors showed a statistically significant association with the pre-test levels of knowledge about CPR among the students, as indicated by a p-value of greater than 0.005. A similar analysis was conducted, but this time the focus was on the association between pre-test levels of skills in CPR and demographic profiles or characteristics. The same demographic variables were considered, including age, gender, religion, course of study, family history of cardiac disease, awareness about CPR, source of information regarding CPR, and attendance in CPR classes within the last 6 months. Just like in Table 7, none of these demographic factors exhibited a statistically significant association with the pre-test levels of CPR skills among the students, as indicated by a p-value greater than 0.005.

DISCUSSION:

In this discussion, we address the study's objectives and the corresponding findings regarding students' knowledge and skills related to cardiopulmonary resuscitation (CPR). The first objective focused on evaluating students' CPR knowledge, with results indicating that a notable percentage exhibited poor knowledge (38.3%), while others displayed average (31.7%) or good knowledge (30%), as presented in the relevant table. The second objective delved into assessing the students' pre-test CPR skills,

revealing that all students had poor skills before the intervention. Moving on to the third objective, we examined the impact of a demonstration on knowledge and skills. The relevant table showed a statistically significant improvement in both knowledge and skills following the demonstration.

Furthermore, the fourth objective involved reassessing knowledge and skills post-intervention, and the results, as indicated in the respective table, demonstrated a considerable enhancement in knowledge, particularly in the "good knowledge" category (53.3%). The fifth objective sought associations between post-test knowledge scores and various demographic variables. However, our analysis, as presented in the associated table, did not reveal any significant associations between these variables and pre-test knowledge levels. Likewise, the sixth objective examined associations between post-test skill scores and demographic variables, yet the findings, illustrated in the relevant table, demonstrated that demographic factors did not significantly influence pre-test skill levels.

Overall, our study underscores the effectiveness of the demonstration method in enhancing CPR knowledge and skills among students. Despite the thorough examination of various demographic variables, our results suggest that these factors had limited impact on the outcomes, emphasizing the importance

of educational interventions for improving CPR proficiency.

CONCLUSION:

The results of the study clearly demonstrate the positive influence of CPR demonstrations on students' knowledge and skills. The significant improvement in both knowledge and skills, as indicated by the p-value, underscores the effectiveness of this educational approach in enhancing preparedness for cardiac arrest scenarios. These findings emphasize the importance of implementing effective CPR demonstrations as a means to equip students with the necessary skills to respond effectively in life-threatening situations, potentially saving lives. This research contributes to the body of knowledge supporting the value of CPR education in educational institutions, with the potential to create a more informed and capable community in responding to cardiac emergencies.

Conflict of Interest: The authors declare that there is no any conflict of interest.

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