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A Study to Assess the Effectiveness of Video Assisted Teaching Programme on Knowledge and Practice Regarding Adult Cardiopulmonary Resuscitation among School Teachers of Selected Schools of Kheda District

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Research Article

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Abstract

Background: Cardiopulmonary resuscitation (CPR) is a critical life-saving procedure performed on individuals who are unresponsive, not breathing normally, and lack a pulse. Its primary goal is to manually maintain brain function until more advanced medical interventions can be applied to restore blood circulation and breathing in cases of cardiac arrest. CPR involves combining rescue breathing (mouth-to-mouth) with chest compressions, typically at a depth of 5 centimeters and a rate of 100 compressions per minute. This method aims to artificially circulate blood to the heart and brain to delay tissue damage and provide a brief window for successful resuscitation without permanent brain injury. CPR is continued until circulation returns or until the person is declared deceased or emergency. The American Heart Association uses the acronym C-A-B to help remember the correct sequence for performing CPR. The first step, Compressions, involves pushing hard and fast on the person's chest. This step is crucial for CPR. To perform compressions correctly, use your hands to push down firmly and quickly on the chest. Rescue breathing, which can be done via mouth-to-mouth or mouth-to-nose if the mouth is injured or inaccessible, is also recommended. For better protection, using a bag-mask device with a high-efficiency particulate air (HEPA) filter is advised for rescue breaths.

Objective

1. To assess the knowledge before and after administration of video assisted teaching programme regarding knowledge on adult cardiopulmonary resuscitation among school teachers of selected schools of Kheda district.
2. To assess the practice before and after administration of video assisted teaching programme regarding knowledge on adult cardiopulmonary resuscitation among school teachers of selected schools of Kheda district.
3. To find out the association of pre-test knowledge and practice score of school teacher on adult cardio-pulmonary resuscitation with their selected demographic variable.
4. To evaluate the effectiveness of video assisted teaching programme on knowledge regarding adult cardiopulmonary resuscitation among school teachers of selected schools of Kheda district.
5. To evaluate the practice regarding adult cardiopulmonary resuscitation after administration of video assisted teaching programme among school teachers of selected schools of Kheda district.

Methodology: The quasi experimental research design is used for this study. The study was conducted on 60 school teachers from selected schools of Kheda district by non-randomize sampling technique. A knowledge questionnaire tool and practice checklist was used for data collection.

Results: In this study total 60 samples in result experimental pretest knowledge score inadequate 18 (60%), moderate 12 (40%), and adequate 0 (0%) and posttest knowledge score is good 8(26.5%), adequate 22(73.3%) inadequate 0 (0%). Pretest practice score poor 5(16.7%), average 25 (83.3%) and good 0 (0%). Posttest practice score average 13(43.3%), good 17(56.7%) and poor 0(0%). Control group pretest knowledge score inadequate 29(96.7%), moderate 3(3.3%), & posttest knowledge score 26(86.7%), moderate 3(10%), adequate 22(73.3%). Pretest practice score good 8(26.7%), average 22(73.3%) and posttest practice score poor 3(10%), average 25(83.3%), good 2 (6.7%).

Conclusion: The result of present study to show that video assisted teaching programme on adult CPR has positive impact, school teachers have good knowledge and poor practice. the study highlights the disparity between knowledge and practice regarding adult CPR among school teachers. Although the majority adequate knowledge and poor practice. This emphasizes the need for targeted educational interventions to improve understanding toward adult CPR.

Keywords: Video Assisted Teaching Programme; Knowledge; Practice; Cardiopulmonary Resuscitation; School Teachers

Abbreviations

CPR: Cardiopulmonary resuscitation; HEPA: High-Efficiency Particulate Air; DACPR: Dispatcher-Assisted Cardiopulmonary Resuscitation.

Introduction

Cardiopulmonary resuscitation (CPR) is a critical life-saving procedure performed [1] on individuals who are unresponsive, not breathing normally, and lack a pulse. Its primary goal is to manually maintain brain function until more advanced medical interventions can be applied to restore blood circulation and breathing in cases of cardiac arrest. CPR involves combining rescue breathing (mouth-to-mouth) with chest compressions, typically at a depth of 5 centimeters and a rate of 100 compressions per minute. This method aims to artificially circulate blood to the heart and brain to delay tissue damage and provide a brief window for successful resuscitation without permanent brain injury. CPR is continued until circulation returns or until the person is declared deceased or emergency.

The American Heart Association uses the acronym C-A-B to help remember the correct sequence for performing CPR. The first step, Compressions, involves pushing hard and fast on the person's chest. This step is crucial for CPR. To perform compressions correctly, use your hands to push down firmly and quickly on the chest. Rescue breathing, which can be done via mouth-to-mouth or mouth-to-nose if the mouth is injured or inaccessible, is also recommended. For better protection, using a bag-mask device with a high-efficiency particulate air (HEPA) filter is advised for rescue breaths.

In the 2015 guidelines, although the number of experts remained similar to previous years, the participation of 10 additional countries was noted. The guidelines introduced several changes, though not as extensive as those in 2010. The most significant update was the increase in the recommended chest compression rate to between 100 and 120 compressions per minute, effectively requiring nearly two compressions per second. Consequently, rescuers were required to compress at a faster pace. The recommended compression depth was set at 5 to 6 cm, and the previous emphasis on the "Push Hard" slogan from the 2005 and 2010 guidelines seemed to diminish. For laypersons, a more precise depth range was suggested due to the practical difficulty of achieving the recommended depth. The 2015 guidelines also reaffirmed the recommendation of "Compression-Only CPR" for laypersons, highlighting its ease of administration by untrained individuals and the minimal impact of skipping rescue breathing on oxygen supply.

In emergencies such as drowning, heart attacks, strokes, cardiac arrest, or choking, immediate and proper training in CPR can be crucial for survival. If a person is not breathing, unconscious, or without a pulse, CPR should be started right away. Modern CPR focuses on chest compressions alone, without the need for mouth-to-mouth resuscitation. The risk of death increases significantly if oxygen is deprived for more than 10 minutes, while brain damage is likely between 6 to 10 minutes. When the heart ceases to beat, blood flow halts, and the brain no longer receives the necessary oxygen. CPR helps by using chest compressions to simulate heart function, circulating oxygenated blood to the brain and body. Essentially, CPR acts as an artificial heart, ensuring blood continues to reach vital organs.

Objectives

1. To assess the knowledge and practice before and after administration of video assisted teaching programme

regarding knowledge on adult cardiopulmonary resuscitation among school teachers of selected schools of Kheda district.

2. To find out the association of pre-test knowledge and practice score of school teacher on adult cardio-pulmonary resuscitation with their selected demographic variable.
3. To evaluate the effectiveness of video assisted teaching programme on knowledge regarding adult cardiopulmonary resuscitation among school teachers of selected schools of Kheda district.
4. To evaluate the practice regarding adult cardiopulmonary resuscitation after administration of video assisted teaching programme among school teachers of selected schools of Kheda district.

Hypothesis

H1: The mean post-test knowledge and practice score of school teachers will be significantly higher than the mean pre-test knowledge and practice score regarding adult cardio pulmonary resuscitation at level of 0.05 level, of significance after administration video assisted teaching programme.

H2: There will be significant association between pre-test knowledge and practice score and selected socio-demographic variable at 0.05 level of significance.

Review of Literature

Lin YY, et al. [2] conducted a systematic review and meta-analysis to compare the effectiveness of video-assisted versus audio-assisted dispatcher-instructed bystander cardiopulmonary resuscitation (DI-CPR). Their study, which included randomized controlled trials up to June 2017, found that video-instructed DI-CPR led to a significantly higher chest compression rate (104.8 compressions per minute) compared to audio-instructed DI-CPR (80.6 compressions per minute), with a difference of 19.9 compressions per minute (95% CI: 10.50-29.38). Although the odds ratio for correct hand positioning between the two methods was 0.8 (95% CI: 0.53-1.30), indicating a trend toward improved positioning with video instructions, the primary advantage of video instruction was the faster compression rate. Similarly, Christopher Plata, et al. conducted a randomized controlled simulation trial, published in BMC Emergency Medicine, to assess the impact of video quality on video-assisted cardiopulmonary resuscitation.

Westch WA, et al. [3] conducted study published in J Telemed Telecare, investigated how different camera perspectives affect the evaluation of cardiopulmonary resuscitation (CPR) performance in a video-assisted setting. In their randomized, controlled simulation trial, they recorded CPR performance from three camera angles: side, foot, and head positions. The study involved 46 paramedics and 47 emergency physicians who assessed seven video sequences from these various perspectives. Of the 651 video sequences reviewed, 96.8% were evaluable, with an overall correct evaluation rate of 74.5%. The results indicated that participants were notably better at identifying errors when the camera was positioned opposite the CPR provider.

Lee SGW, et al. [4] study published in Am J Emerge Med, evaluated a new dispatcher-assisted cardiopulmonary resuscitation (DACPR) protocol that transitions from an audio to a video call. This study aimed to assess whether video-based DACPR (V-DACPR) improves the quality of bystander CPR. In a randomized controlled simulation trial involving 131 volunteers, the researchers compared chest compressions performed under three DACPR protocols. The analysis revealed that V-DACPR with rapid transition resulted in the highest proportion of correct hand positioning (92.7%) compared to the traditional audio-based DACPR (82.4%, p = 0.03). Participants in the V-DACPR groups demonstrated better overall CPR quality, including more accurate hand placement and deeper compressions, than those in the audio-based DACPR group.

Method

Research Approach: Quantitative approach.

Research Design: The quasi experimental research design.

Dependent Variable: Knowledge and practice of cardiopulmonary resuscitation.

Independent Variable: Video Assisted Teaching Programme.

Socio Demographic Variable: Age, gender, source of information, Family members belongs to health care profession, Higher qualification, monthly income, Previously attended training.

Population: School teacher.

Research Settings: Selected school teacher kheda district.

Sampling Technique: Non-probability purposive sampling technique.

Sample Size: 60

Sampling Criteria

Inclusion Criteria

- School teachers who are all willingly to participate in this study.
- School teachers who are available at the time of data collection.
- Secondary & higher secondary school teachers of private schools.

Exclusion Criteria

- Who are already attended cardiopulmonary resuscitation training recently.
- School teachers throughout not co-operative through the study.
- School teachers who are not available at the time of data collection.

Tool for Data Collection

Part 1: Demographic data of school teacher.
Part 2: Assessment of knowledge by structured knowledge questionanaire.
Part 3: Assessment of CPR procedure by practice check list.

Results

Demographic Variables	Experimental Group		Control Group	
	Frequency	Percent	Frequency	Percent
Age of Teacher				
20-29	10	33.30%	2	6.70%
30-39	10	33.30%	17	56.70%
40-49	9	30%	9	30%
50-59	1	3.30%	2	6.70%
Gender				
Male	15	50%	8	26.70%
Female	15	50%	22	73.30%
Family Member in Health				
Father/Mother	5	16.70%	5	16.70%
Brother/Sister	3	10%	6	20%
No One	15	50%	11	36.70%
Relatives	7	23.30%	8	26.70%
Source of Information				
Mass Media	8	26.70%	12	40%
Colleagues	0	0%	3	10%
Relatives	2	6.70%	6	20%
Any Other	20	66.70%	9	30%
Qualification				
B.Ed.	25	83.30%	22	73.30%
M.Ed.	3	10%	2	6.70%
Ph.D.	1	3.30%	0	0%
PTC	1	3.30%	6	20%
Monthly Income				
<10000 Rs	1	3.30%	7	23.30%
10000-15000 Rs	3	10%	5	16.70%
15000-20000 Rs	5	16.70%	8	26.70%
>200000 Rs	21	70%	10	33.30%
Any CPR Training				
Yes	1	3.30%	3	10%
No	29	96.70%	27	90%

Table 1: Frequency and percentage distribution of demographic variables of Teachers in experimental and control group.

In Table 1 the experimental group, the age distribution among teachers shows that a majority are between 20-39 years, with 33.3% falling in the 20-29 age range and another 33.3% in the 30-39 age range. About 30% of the teachers are aged between 40-49 years, and only 3.3% are in the 50-59 age range. In contrast, the control group has a larger proportion of teachers (56.7%) in the 30-39 age range, with 30% aged 40-49 years. Only 6.7% of the teachers in this group fall in the 20-29 and 50-59 age ranges, respectively.

Regarding gender distribution, the experimental group has an equal representation of male and female teachers, each comprising 50% of the group. However, in the control group, female teachers are predominant, accounting for 73.3%, while male teachers make up the remaining 26.7%.

When examining the presence of family members in the health profession, 50% of the teachers in the experimental group reported that none of their family members are in the health field. In this group, 16.7% have a father or mother in the health profession, 10% have a brother or sister, and 23.3% have relatives in this field. In the control group, 36.7% of teachers reported having no family members in the health profession, while 16.7% have a father or mother, 20% have a brother or sister, and 26.7% have other relatives in the health profession.

The source of information regarding cardiopulmonary resuscitation (CPR) varied among the teachers. In the experimental group, the majority (66.7%) obtained information from other unspecified sources, while 26.7% received it from mass media, and 6.7% from relatives. None of the teachers in this group reported colleagues as a source of information. Conversely, in the control group, 40% of the teachers received CPR information from mass media, 30% from other unspecified sources, 20% from relatives, and 10% from colleagues.

In terms of educational qualifications, a significant majority of teachers in the experimental group (83.3%) hold a B.Ed. degree, with smaller proportions having M.Ed. (10%), Ph.D. (3.3%), or PTC (3.3%) qualifications. In the control group, 73.3% of the teachers hold a B.Ed. degree, 20% have a PTC qualification, and 6.7% have an M.Ed. degree, with none holding a Ph.D.

The monthly income distribution shows that 70% of the teachers in the experimental group earn more than ₹20,000 per month. Meanwhile, 16.7% have a monthly income between ₹15,000-20,000, 10% between ₹10,000-15,000, and only 3.3% earn less than ₹10,000. In the control group, the income distribution is more varied, with 33.3% earning more than ₹20,000, 26.7% between ₹15,000-20,000, 16.7% between ₹10,000-15,000, and 23.3% earning less than ₹10,000 [5,6].

Finally, concerning prior CPR training, an overwhelming majority (96.7%) of teachers in the experimental group reported not having any prior CPR training, with only 3.3% having received training. In the control group, 90% of the teachers have not received CPR training, while 10% have.

Demographic Variables	Experimental		Level of knowledge			χ2	df	P-Value
	F	%	Moderate	Inadequate	Adequate			
Age in Years								
20-29	10	33.30%	5	5	0	2.69	3	0.443 NS
30-39	10	33.30%	5	5	0			
40-49	9	30%	2	7	0			
50-59	1	3.30%	0	1	0			
Gender								
Male	15	50%	9	6	0	5	1	0.25 S
Female	15	50%	3	12	0			
Family Member in Health								
Father/Mother	5	16.70%	2	3	0	3.1	3	0.377 NS
Brother/Sister	3	10%	2	1	0			
No One	15	50%	7	8	0			
Relatives	7	23.30%	1	6	0			
Source of Information								

Mass Media	8	26.70%	3	5	0	1.56	2	0.456 NS
Colleagues	0	0%	0	0	0			
Relatives	2	6.70%	0	2	0			
Any Other	20	66.70%	9	11	0			
Qualification								
B.Ed.	25	83.30%	10	15	0	2.22	3	0.528 NS
M.Ed.	3	10%	1	2	0			
Ph.D.	1	3.30%	0	1	0			
PTC	1	3.30%	1	0	0			
Monthly Income								
<10000 Rs	1	3.30%	0	1	0	8571	3	0.036 S
10000-15000 Rs	3	10%	3	0	0			
15000-20000 Rs	5	16.70%	0	5	0			
>200000 Rs	21	70%	9	12	0			
Any CPR Training								
Yes	1	3.30%	0	1	0	0.69	1	0.406 NS
No	29	96.70%	12	17	0			

Note: S-Significant at 5% level (p<0.05), NS-Not significant at 5% level (p>0.05), (f)= Frequency, (%)= Percentage.

Table 2: Association between Pretest level of knowledge and selected demographic variable of the teachers in experimental group (n=30).

Table 2 presents the association between the pre-test level of knowledge regarding Adult Cardiopulmonary Resuscitation (CPR) and selected demographic variables among school teachers in the experimental group.

Age: The chi-square test for the association between age and pre-test knowledge levels shows that there is no significant association ($\chi^2 = 2.685$, df = 3, p = 0.443), indicating that age does not have a significant influence on the knowledge level in this group.

Gender: A significant association was found between gender and pre-test knowledge levels ($\chi^2 = 5.00$, df = 1, p = 0.025), suggesting that gender plays a significant role in the knowledge of CPR among the teachers.

Family Member in Health: There was no significant association found between having a family member in the health sector and pre-test knowledge levels ($\chi^2 = 3.095$, df = 3, p = 0.377), implying that this variable does not significantly affect the knowledge level.

Source of Information: The source of information did not show a significant association with pre-test knowledge levels ($\chi^2 = 1.56$, df = 2, p = 0.456), indicating that the source of information did not significantly impact the teachers' knowledge.

Qualification: The association between educational qualification and pre-test knowledge levels was not significant ($\chi^2 = 2.222$, df = 3, p = 0.528), suggesting that the level of educational qualification does not significantly affect knowledge about CPR.

Monthly Income: A significant association was found between monthly income and pre-test knowledge levels ($\chi^2 = 8.571$, df = 3, p = 0.036), indicating that income levels significantly impact the knowledge of CPR among the teachers.

Any CPR Training: No significant association was found between prior CPR training and pre-test knowledge levels ($\chi^2 = 0.690$, df = 1, p = 0.406), suggesting that prior training does not significantly influence the knowledge level.

Overall, Table 2 highlights that among the demographic variables, gender and monthly income are significantly associated with the pre-test knowledge level regarding Adult Cardiopulmonary Resuscitation, while other variables like age, family members in health, source of information, qualification, and prior CPR training did not show a significant association.

Demographic Variables	Experimental		Level of knowledge			$\chi 2$	df	P-Value
	F	%	Average	Poor	Good			
Age in Years								
20-29	10	33.30%	8	2	0	0.8	3	0.849 NS
30-39	10	33.30%	9	1	0			
40-49	9	30%	7	2	0			
50-59	1	3.30%	1	0	0			
Gender								
Male	15	50%	12	3	0	0.24	1	0.62 NS
Female	15	50%	13	2	0			
Family Member in Health								
Father/Mother	5	16.70%	3	2	0	2.71	3	0.439 NS
Brother/Sister	3	10%	3	0	0			
No One	15	50%	13	2	0			
Relatives	7	23.30%	6	1	0			
Source of Information								
Mass Media	8	26.70%	5	3	0	3.54	2	0.17 NS
Colleagues	0	0%	0	0	0			
Relatives	2	6.70%	2	0	0			
Any Other	20	66.70%	18	2	0			
Qualification								
B.Ed.	25	83.30%	22	3	0	6.19	3	0.103 NS
M.Ed.	3	10%	1	2	0			
Ph.D.	1	3.30%	1	0	0			
PTC	1	3.30%	1	0	0			
Monthly Income								
<10000 Rs	1	3.30%	0	1	0	6.68	3	0.83 NS
10000-15000 Rs	3	10%	2	1	0			
15000-20000 Rs	5	16.70%	5	0	0			
>200000 Rs	21	70%	18	3	0			
Any CPR Training								
Yes	1	3.30%	1	0	0	0.21	1	0.649 NS
No	29	96.70%	24	5	0			

Note: S-Significant at 5% level (p<0.05), NS-Not significant at 5% level (p>0.05)(f)= Frequency, (%)= Percentage.
Table 3: Association between Pretest level of Practice and selected demographic variable of the teachers in experimental group (n=30).

Table 3 reveals that none of the selected demographic variables, including age, gender, family member in health, source of information, qualification, monthly income, and prior CPR training, have a significant association with the pretest level of practice regarding CPR among the school teachers in the experimental group.

Age: The chi-square test results indicate that there is no significant association between age and the pretest level of practice (χ^2 = 0.800, df = 3, p = 0.849). This suggests that age does not significantly influence the practice levels in this group.

Gender: Similarly, gender was not found to be significantly associated with the pretest level of practice (χ^2 = 0.240, df = 1, p = 0.620). This indicates that both male and female teachers have similar levels of practice in CPR.

Family Member in Health: The association between having a family member in the health sector and the pretest level of practice is not significant (χ^2 = 2.709, df = 3, p = 0.439), suggesting that this demographic variable does not significantly impact the teachers' practice levels.

Source of Information: There was no significant association found between the source of information and the pretest level of practice (χ^2 = 3.54, df = 2, p = 0.170). This implies that the source of information did not significantly affect the practice of CPR among the teachers.

Qualification: Educational qualification did not show a significant association with the pretest level of practice (χ^2 = 6.19, df = 3, p = 0.103), indicating that different levels of qualification among teachers do not significantly influence their practice of CPR.

Monthly Income: No significant association was found between monthly income and the pretest level of practice (χ^2 = 6.68, df = 3, p = 0.083). This suggests that income levels do not significantly affect CPR practice among the teachers.

Any CPR Training: The results also indicate that prior CPR training does not have a significant association with the pretest level of practice (χ^2 = 0.207, df = 1, p = 0.649), suggesting that previous training does not significantly influence the practice levels.

Discussion & Conclusion

The study was done to assess the effectiveness of video assisted teaching programme on knowledge and practice regarding adult CPR on school teachers of selected schools of Kheda district. The study considered of 60 samples that were selected on the basis of non-randomized quasi experimental sampling technique. Based on objective, data analysis was done.

Recommendation

The similar study can be conducted with large samples and different demographic variable.

A similar study can be do at different settings to strengthen findings.

A study can be conducted by qusiexperiment research design.

The study can be conducted with aim to provide guideline.

Consent and Ethical Approval

Ethical approval for the presence study was obtained from institutional ethics committee for human research of Maganbhai Adenwala Mahagujrat University, Nadiad. (Approval No: MAM Uni / IECHR / 2024 / 41), (Ref No: IEC – MAM Uni / 2023-2024 / 4).

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Competing Interest

Authors have declared that no competing interest exists.

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