

A quasi-experimental study to assess the effectiveness of video assisted teaching on knowledge regarding pre-hospital management of acute myocardial infarction among bus operator from selected areas of Pune city

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ABSTRACT

Introduction: Myocardial infarction (MI) affects over 3 million individuals globally and is responsible for over 1 million deaths annually in the United States. MI results in irreversible myocardial damage due to inadequate oxygen supply, potentially impairing both diastolic and systolic functions, and increasing the risk of life-threatening arrhythmias. Prompt restoration of blood flow is critical, with treatment within six hours of symptom onset significantly improving outcomes.

Aims of the Study: The study aimed to evaluate the effectiveness of video-assisted teaching in enhancing knowledge regarding the pre-hospital management of acute myocardial infarction among bus operators in selected areas of Pune city.

Methodology: A Quantitative, Quasi Experimental Study design was adopted. A total of 120 participants were selected using a non-probability purposive sampling technique. Data were collected through a structured demographic questionnaire and analyzed using descriptive statistics.

Results: The post-test mean score was 15.23 with a standard deviation of 2.21. Demographic variables including age, gender, education, years of experience, and prior knowledge did not exhibit a statistically significant association with knowledge outcomes ($p > 0.05$). Notably, 76.67% of participants in the experimental group achieved excellent post-test scores, indicating a significant improvement in knowledge following the video-assisted intervention. The control group showed minimal improvement, further validating the intervention's effectiveness.

Conclusion: The study concluded that video-assisted teaching significantly enhances knowledge regarding pre-hospital management of Acute Myocardial Infarction among bus operators. The intervention's effectiveness was independent of demographic variables, suggesting its broad applicability across diverse groups.

KEYWORDS: Effectiveness, Video-assisted teaching, Pre-hospital management, Acute myocardial infarction, Knowledge, Bus operators.

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INTRODUCTION

"A heartbeat signifies life, and its absence signifies death." The technical term for cardiac arrest is myocardial infarction. Since the condition has become so prevalent in wealthy nations, heart attacks are becoming a greater threat. The disease is also more common in nations with poor infrastructure. Smoking cigarettes, sedentary lifestyles, type 2 diabetes, elevated blood pressure, obesity, raised cholesterol (especially LDL), and higher triglycerides are some of these modifiable risk factors. However, the incidence of atherosclerosis & AMI cannot be predicted by variables such as age, gender, or family history.

A heart attack, also known as a severe myocardial infarction, occurs when the supply to the circulatory muscle is abruptly interrupted, causing tissue damage. This often occurs when a small number of coronary artery arteries become clogged. A formation of plaque, which is mainly made up of lipids, cholesterol, and cell waste materials, or an unanticipated blood coagulation that develops on the obstruction can both result in an obstruction.⁴ Medical professionals and paramedics may arrive with rapid, soothing treatments at this initial presentation, when the symptoms may be more severe. Unfortunately, there are many missed opportunities to improve patient care and triage because the prehospital stage of the diagnosis process is usually ignored. Additionally, needless admissions could happen.

Acute myocardial infarction causes over 500,000 deaths each year. These happen outside of hospitals in at least half of cases. There is strong evidence that cardiac arrhythmias account for the majority of these fatalities. The majority of heart attack deaths happen within the first few hours of the onset of severe pain, highlighting the necessity for prompt intervention, according to statistics of Falcon and colleagues, Partridge & Geddes was, Aldrich & associates, and Kuller & colleagues. The problem appears to have a straightforward solution. Deliver the coronary care unit's amenities to the patient as soon as possible.

NEED OF THE STUDY

Cardiovascular disease is the leading cause of sickness and death worldwide. State governments differ greatly in the amount of cases of ischemic coronary syndrome and stroke, the two most prevalent cardiac conditions in India. In all regions of India, their incidence is rising along with that of a number of serious risk factors, particularly ischemic heart disease, which has seen the biggest increase in recurrence. Acute myocardial infarction has a 30% fatality rate; half of victims pass away before they ever get to the hospital. Five to ten percent of survivors of myocardial infarction pass away within a single year following the event. Within a year of their initial myocardial infarction, over half of all patients are readmitted to the hospital.

Acute myocardial infarction patients must wait more than two hours to receive assistance, according to statistics. Myocardial infarction caused by ST elevation (STEMI) or non-ST spike myocardial infarction (NSTEMI) can be distinguished from one another based on the results of an ECG. A heart attack is defined by medical professionals as a potentially lethal ailment that happens if the blood flow to the heart is suddenly cut off. Cutting off the heart's blood supply abruptly causes tissue damage and increases the risk of death. When a number of coronary arteries are clogged, the heart muscles often do not get blood flow. Coronary artery blockage is usually caused by a chronic build-up of plaque in the circulating blood vessels. Plaque is created when fat, cholesterol, and waste products from cells accumulate in the artery over time. Occasionally, the coronary artery plaque may rupture and form a clot, reducing the amount of blood that reaches the heart's muscles. The danger of injured cardiac muscles is increased by the disruption in blood circulation.

MATERIALS AND METHODS

This quantitative study employed a quasi-experimental design to assess the effectiveness of an educational video on acute myocardial infarction (AMI) awareness and first aid among bus operators. The target population consisted of bus operators, with a sample size of 120 in which 60 was experimental group and 60 was control group determined by considering a 5% margin and selected using purposive non-probability sampling. The intervention involved a video-based teaching session on recognizing AMI symptoms and administering first aid, with participants' knowledge assessed through structured questionnaires before and after the intervention. The tool's validity was confirmed by 11 experts on 10.11.24, yielding a strong Scale Content Validity Index (SCVI) of 0.8977. Reliability was also high, with a Pearson correlation (r) of 0.8977. A pilot study was conducted on 30.11.24 at the Hadapsar Bus Depot to test feasibility, which was confirmed. Data will be analyzed using descriptive statistics, including mean, mode, and standard deviation, along with inferential analysis. Additionally, chi-square tests will be used to explore associations between knowledge scores and demographic variables. Frequency distribution will also be created to understand the sample composition based on demographic characteristics.

RESULTS

SECTION - I Demographic data of the sample. (Experimental and Control Group)

In the experimental group, the majority of participants (33.33%) were between the ages of 18 and 27, followed by those aged 28 to 37 (30.00%). Males made up 58.33% of the group, and most participants were illiterate (28.33%). In terms of experience, 35.00% had 7-10 years of experience, and 66.67% lacked any prior knowledge of myocardial infarction. In the control group, the majority (33.33%) were between the ages of 28 and 37, with those aged 18 to 27 coming in second (31.67%). Males accounted for 53.33%, and most participants had completed secondary education (28.33%). Similar to the experimental group, 35.00% had 7-10 years of experience, and 68.33% had no prior knowledge of myocardial infarction.

SECTION II-

Section II a: Finding related to related to Pre-test level of knowledge regarding Pre-hospital management of acute myocardial infarction among the Bus operator from selected areas Pune City. (Experimental and Control Group)

Table No.1 - Related to pretest level of Knowledge.

Table No. 1

n= (Experimental group 60, control group 60)

LEVEL OF KNOWLEDGE PRE TEST EXPERIMENTAL AND CONTROL GROUP	EXPERIMENTAL GROUP				CONTROL GROUP			
	f	%	Mean	SD	f	%	Mean	SD
POOR (0 - 6)	30	50	7.65	3.29	29	48.33	8.26	3.5
GOOD (7-13)	24	40			21	35		
EXCELLENT (14-20)	6	10			10	16.66		

In the experimental group, 50% of participants had poor knowledge (scores 0-6) with a mean score of 7.65 and a standard deviation of ± 3.29 . 40% had good knowledge (scores 7-13), and 10% had excellent knowledge (scores 14-20), indicating low baseline understanding. In the control group, 48.33% were in the poor knowledge category (scores 0-6) with a median score of 8.26 and variance of 3.5. 35% had good knowledge, and 16.67% had excellent knowledge, reflecting a similar distribution of limited prior knowledge with a small percentage of higher comprehension.

Section IIb: Finding related to Post-test level of knowledge regarding Pre-hospital management of acute myocardial infraction among the Bus operator from selected areas Pune City. (Experimental and Control Group)

Table No.2 - Related to post-test level of Knowledge.

Table no.2		n= (Experimental group 60 Control Group 60)							
LEVEL OF KNOWLEDGE EXPERIMENTAL AND CONTROL	EXPERIMENTAL GROUP				CONTROL GROUP				
	f	%	Mean	SD	f	%	Mean	SD	
POOR (0 - 6)	0	0	15.23	2.21	30	50.00	8.30	3.43	
GOOD (7-13)	14	23.33			21	35.00			
EXCELLENT (14-20)	46	76.67			9	15.00			

The experimental group showed significant improvement in knowledge after the intervention, with 76.67% of participants scoring in the excellent knowledge category (14-20), and no one in the poor knowledge category. The mean score increased to 15.23, reflecting a substantial gain in comprehension. In contrast, the control group showed minimal improvement, with 50% remaining in the poor knowledge category and a mean score of 8.30. Only 15% of control group participants achieved excellent knowledge, indicating that the intervention was more effective in enhancing knowledge compared to the control group.

SECTION III

Section III (A): Finding related to assess the effectiveness of video assisted teaching on knowledge regarding Pre-hospital management of acute myocardial infraction among the Bus operator from selected areas of Pune City. (Experimental group)

Table No.3 - related to assess knowledge regarding Pre hospital management of myocardial infraction among Bus operators in selected areas of Pune city.

Video Assisted technique Experimental group Effectiveness	Mean	SD	DF	T test calculated value	P value	Remark
Pre test	7.65	3.29	59	15.3624	0.00001	Significant
Post test	15.2	2.21	59			

The test group's results before and after the test showed a considerable improvement, indicating the effectiveness of the video-assisted technique. The mean score prior to the test was 7.65 with a typical deviation of 3.29, however the median score following the test rose to 15.23 and an ordinary variation of 2.21. The statistically significant distinction amongst the pre- and post-test results is shown by the T-test estimated costs of 15.3624 and the chance level of 0.00001. The efficiency of the intervention was demonstrated by the P-value, which was significantly lower than the traditional significant threshold of 0.05 and indicated the Video Assisted approach significantly improved respondents' understanding.

Section III (B): Finding related to assess the effectiveness of video assisted teaching on knowledge regarding Pre-hospital management of acute myocardial infraction among the Bus operator from selected areas of Pune City. (Control group)

Table No.4 - related to assess knowledge regarding Pre hospital management of myocardial infraction among Bus operators in selected areas of Pune city.

Video Assisted technique Control group Effectiveness	Mean	SD	DF	T test calculated value	P value	Remark
Pre test	8.26	3.50	59	0.0410	0.96702	Not Significant
Post test	8.3	3.43	59			

The control group's pre- and post-test results revealed little variation, suggesting that the video-assisted method was effective. The pre-test mean was 8.26 and an average difference of 3.50, while the post-test mean was 8.30 with a standard variability of 3.43. The T-test estimated value of 0.0410 and p-value of 0.96702 indicated that there was no significant difference between the scores obtained prior to and after the test. Since the P-value is far greater than the usual significance threshold of 0.05, it implies that there was no appreciable increase in knowledge for that control group. This result implies that the Video Assisted approach had no discernible effect on the control group.

Section III (C): Finding related to Post-test of experimental and control group effectiveness of video assisted teaching on knowledge regarding Pre-hospital management of acute myocardial infarction among the Bus operator from selected areas of Pune City. (Experimental and Control Group)

Table No.5 - pertaining to evaluating bus operators' post-test knowledge of pre-hospital treatment for myocardial infarction in specific Pune city neighbourhoods.

Video Assisted technique On Post test experimental and Control group Effectiveness	Mean	SD	DF	T test calculated value	P value	Remark
Experimental Post test	15.23	2.21	59	13.0300	0.00001	Significant
Control Post test	8.3	3.43	59			

The post-test results show a significant difference between the control and experimental groups. The experimental group, using the video-assisted technique, had a mean score of 15.23 (SD = 2.21), while the control group, without the intervention, scored 8.3 (SD = 3.43). A t-test revealed a calculated t-value of 13.03 and a p-value of 0.00001, indicating a statistically significant improvement in the experimental group. This demonstrates that the video-assisted technique was more effective in enhancing knowledge compared to the control group.

Section IV -

Section IV (A): finding related to association between pre-test knowledge score with the selected demographic variables. (Experimental Group)

The study found no significant correlation between demographic factors and knowledge levels regarding pre-hospital treatment of cardiac arrest among transportation providers in Pune. Chi-square tests showed that age, gender, education level, years of experience, and prior knowledge of acute myocardial infarction did not significantly affect knowledge levels, with p-values exceeding 0.05. These results suggest that the control group's response to the intervention was not influenced by these demographic characteristics.

Section IV (B): finding related to association between pre-test knowledge score with the selected demographic variables. (Control Group)

The study found no significant correlation between demographic factors and knowledge of pre-hospital management of myocardial infarction among bus operators in Pune. Chi-square tests showed that age ($\chi^2 = 1.59$, $p = 0.953$), gender ($\chi^2 = 1.364$, $p = 0.506$), education level ($\chi^2 = 9.168$, $p = 0.328$), years of training ($\chi^2 = 3.555$, $p = 0.737$), and prior knowledge of myocardial infarction ($\chi^2 = 1.026$, $p = 0.599$) did not significantly affect knowledge levels. These results suggest that demographic characteristics did not influence the participants' understanding, indicating that other factors may have influenced the intervention's effectiveness.

FINDINGS

Section I – Distribution of subjects, according to their demographic variables.

Distribution of subjects according to their demographic variables. (Experimental and control Group)

In the experimental group, 33.33% of participants are aged 18-27, with 58.33% being male. The majority (28.33%) are illiterate, and 35% have 7-10 years of work experience. Additionally, 66.67% had no prior knowledge of myocardial infarction. In the control group, 33.33% are aged 28-37, and 53.33% are male. Most (28.33%) have secondary education, 35% have 7-10 years of experience, and 68.33% had no prior knowledge of myocardial infarction.

Section II- Assessment of level of knowledge regarding Pre-hospital management of acute myocardial infarction before and after intervention among the Bus operator from selected areas Pune City.

The pre-test results revealed a significant knowledge gap in both the experimental and control groups regarding pre-hospital care for acute myocardial infarction (AMI). In the experimental group, 50% had weak knowledge (scores 0-6), while 40% had moderate knowledge (scores 7-13), and only 10% demonstrated strong knowledge (scores 14-20). The control group showed a similar pattern, with 48.33% having weak knowledge and 35% showing good knowledge. Post-test results showed significant improvement in the experimental group, with 76.67% achieving excellent knowledge (scores 14-20) and 23.33% showing good knowledge. The experimental group's mean score increased to 15.23, while the control group showed minimal improvement, with 50% still in the poor knowledge category and a mean score of 8.30. This highlights the effectiveness of the educational intervention in the experimental group.

Section III-Description of the effectiveness of video assisted teaching on knowledge regarding Pre-hospital management of acute myocardial infarction among the Bus operator from selected areas of Pune City. (Experimental and control Group).

The study found that the video-assisted technique significantly improved knowledge in the experimental group. Prior to the intervention, the experimental group had a mean pre-test score of 7.65 (SD = 3.29). After the intervention, their median post-test score increased to 15.23 (SD = 2.21), with a t-test value of 15.3624 and a p-value of 0.00001, indicating a significant improvement. In contrast, the control group's scores showed little change, with a pre-test score of 8.26 (SD = 3.50) and a post-test score of 8.3.

(SD = 3.43), supported by a t-test value of 0.0410 ($p = 0.96702$). These findings highlight the effectiveness of the video-assisted method in enhancing knowledge about the pre-hospital management of acute myocardial infarction.

Section IV- Description of an association of knowledge with selected demographic variables.

The chi-square analysis found no significant correlation between demographic characteristics and knowledge of acute myocardial infarction in both the experimental and control groups. In the experimental group, age, gender, education level, work experience, and prior knowledge showed no significant impact on knowledge levels, with p-values exceeding 0.05. Similarly, in the control group, age, gender, education, work experience, and prior knowledge also did not significantly affect knowledge, as indicated by p-values above 0.05. These results suggest that other factors, aside from demographics, may influence knowledge levels, emphasizing the importance of structured education and awareness programs to improve knowledge across all groups.

DISCUSSION

These results align with a study carried out by Adduri Sarika (2018), which assessed the impact of video-assisted teaching versus traditional lecture methods on staff nurses' knowledge concerning the immediate management of myocardial infarction. Sarika's study revealed that while both educational approaches improved knowledge levels, video-assisted teaching resulted in a more substantial enhancement. In particular, there was a statistically significant distinction favouring the video-assisted method, with the mean post-test knowledge rating for the video-assisted group being 25.4 and the lecture group's being 19.36.

The parallel outcomes between these studies suggest that video-assisted teaching methodologies are effective across diverse populations, including both healthcare professionals and non-medical personnel such as bus operators. The visual and interactive nature of video-assisted learning likely facilitates better comprehension and retention of critical information, which is essential for effective pre-hospital AMI management. In conclusion, integrating video-assisted teaching into training programs for bus operators and similar groups could significantly enhance their preparedness to manage AMI situations, potentially improving patient outcomes through timely and informed interventions.

CONCLUSION

This quasi-experimental study assessed the impact of video-assisted instruction on bus operators' knowledge of pre-hospital management of acute myocardial infarction (AMI) in Pune. Pre-test results showed both groups had limited knowledge, with the experimental group scoring an average of 7.65 and the control group 8.26. Post-test results revealed a significant improvement in the experimental group, with 76.67% achieving excellent knowledge (scores 14-20), while the control group showed minimal improvement. The experimental group's mean score increased to 15.23, indicating the effectiveness of video-assisted education in improving knowledge retention. These findings highlight the importance of structured educational initiatives and suggest that video-assisted instruction can enhance bus operators' ability to manage cardiac emergencies. Further research with larger sample sizes and longer follow-up recommended assessing knowledge retention and practical application.

DECLARATION BY AUTHORS

Ethical Approval: The study was approved by the institutional ethics committee of Bharati Vidyapeeth College of Nursing, Pune. The study participants were briefed about the purpose and nature of the study and written informed consent was obtained before data collection.

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Conflict of Interest: The authors declare no conflict of interest.

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