



The Effect of Multimedia-Based Education on Treatment Adherence, Self-Efficacy, and Readmission Rates in Post-Percutaneous Coronary Patients

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ABSTRACT

Patients with coronary heart disease (CHD) who undergo Percutaneous Coronary Intervention (PCI) experience faster recovery and a short hospital stay of up to three days. A short hospitalization process requires nursing interventions that are easily understood by patients and families, namely multimedia education, which aims to provide motivation so that patients become stronger when continuing their normal lives and returning to productivity. If patients do not carry out this behavior, the risk of myocardial infarction, stroke, and even death increases. to evaluate the effectiveness of multimedia-based education on medication adherence, self-efficacy and readmission rates of post PCI patients. Using quantitative research parallel Randomized controlled trial with a sample size of 100 people, by comparing the intervention group who received multimedia-based educational treatment and the control group who received standard therapy / leaflet at Gatot Soebroto Army Hospital. This study employed block randomization with a four-combination design in a 1:1 ratio. When all combinations were exhausted, the sequence returned to the initial combination. The randomization, therapists, data collectors, and data analysts were blinded to the study hypothesis. Data allocation was performed using random numbers, with odd and even numbers serving as the basis for assignment. Independent sample t-test in the intervention group on treatment compliance obtained a p-value of 0.441 with an effect size of 0.0168 (1.68%). While the measurement of self-efficacy is p-value 0.060 with an effect size of 0.1608 (16.08%). The Fisher Exact test showed that there was a significant difference between the two groups and the measurement of readmission rates decreased by 87.6% after being given multimedia education and a post-test of treatment adherence and self-efficacy. This study shows that the intervention of the effect of multimedia education on treatment compliance, self-efficacy and readmission rates in post PCI patients has a significant effect p-value > 0.05, there is an increase in treatment compliance, self-efficacy and a decrease in readmission rates in patients who have undergone PCI at RSPAD Gatot Soebroto.

Keywords: coronary heart disease; medication adherence; multimedia education; percutaneous coronary intervention; readmissions; self-efficacy

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INTRODUCTION

Coronary Artery Disease (CAD) is one of the most common inpatient diagnoses in developed countries and remains a leading cause of death and suffering worldwide (Zhong et al., 2019). The World Health Organization (WHO) in 2022 reported that CAD is among the top causes of mortality globally, accounting for 87.8% of deaths due to cardiovascular diseases, stroke, and other non-communicable diseases in 2019. CAD alone contributes to 17.9 million deaths annually, with one-third occurring in individuals under 70 years of age (Keperawatan et al., 2023). In countries such as the United States and Western Europe, CAD remains a significant health burden, while in Mexico it was reported as one of the leading causes of death in 2019, with a prevalence of 55% or 55.4 million people affected (WHO, 2020). In Indonesia, the prevalence of CAD reaches 1.5% or approximately 1,017 million people. Specifically, in DKI Jakarta, the prevalence among men is 1.3% (510,000 individuals) and among women 1.6% (506,000 individuals) (Tim Rikesdas, 2018). Furthermore, 2.3% of total deaths in Indonesia are caused by CAD (Ministry of Health, Republic of

Indonesia, 2018). At RSPAD Gatot Soebroto Hospital, 3–4 CAD patients undergo blood flow revascularization procedures daily. One of the revascularization therapies for CAD patients is myocardial reperfusion through Percutaneous Coronary Intervention (PCI).

PCI is a medical procedure used to manage coronary artery disease (Sofiani, 2025). It restores optimal coronary blood flow by dilating narrowed vessels with a balloon catheter or stent. PCI is considered a low-risk intervention with faster recovery times and shorter hospital stays, usually up to three days. However, shorter hospitalization combined with poor patient adherence to healthy behaviors increases the likelihood of rehospitalization and raises the risks of myocardial infarction, stroke, and even death (Wong et al., 2020). One nursing intervention that aligns with short hospitalization periods and is easy to understand for both patients and families is multimedia-based education. Providing multimedia education is expected to assist patients and families in identifying needs, implementing care, and coordinating post-discharge treatment. This approach may enhance treatment adherence, maintain patient condition after PCI, and prevent hospital readmission. Furthermore, it is closely linked to patients' self-efficacy in following prescribed treatment, thereby supporting optimal adherence among CAD patients. This aims to evaluate the effectiveness of multimedia-based education on medication adherence, self-efficacy and readmission rates of post PCI patients.

METHOD

This study employed a quantitative design with a parallel randomized controlled trial (RCT) approach, comparing an intervention group receiving multimedia-based education with a control group receiving standard education in the form of a leaflet. The research began with proposal preparation in March 2024, followed by data collection from November 2024 to January 2025 at the cardiac clinic and the third-floor cardiac ward of the Darmawan Pavilion, RSPAD Gatot Soebroto Hospital, Jakarta. Data analysis continued until February 2025. The study population included patients diagnosed with CAD scheduled to undergo PCI. Inclusion criteria were CAD patients, based on medical records, who were either admitted to the third-floor cardiac ward or scheduled for PCI in the cardiac clinic. Exclusion criteria included post-PCI patients admitted to the ICU, those hospitalized for fewer than two days, patients experiencing complications before or after PCI, and emergency PCI cases. The total sample comprised 100 respondents, divided equally into intervention and control groups (50 patients each). This study employed block randomization with a four-combination design in a 1:1 ratio. When all combinations were exhausted, the sequence returned to the initial combination. The randomization, therapists, data collectors, and data analysts were blinded to the study hypothesis. Data allocation was performed using random numbers, with odd and even numbers serving as the basis for assignment.

The independent variable was multimedia education, while the dependent variables included medication adherence, self-efficacy, and readmission rates. Confounding variables were age, sex, education, and comorbidities. Research instruments comprised of a demographic questionnaire, the Morisky Medication Adherence Scale (MMAS) to assess adherence, and the Cardiac Self-Efficacy Questionnaire (CSEQ) to measure self-efficacy. The instruments used in this study were the Cardiac Self-Efficacy Questionnaire (CSEQ), consisting of sixteen items with a reliability value of 0.84, to measure self-efficacy, and the Morisky Medication Adherence Scale (MMAS-8), comprising eight items with a reliability value of 0.88, to assess medication adherence. Readmission data were obtained from medical records within 30 days post-PCI. Data collection was conducted through online questionnaires and medical record review, followed by statistical analysis to evaluate the effectiveness of multimedia education on adherence, self-efficacy, and readmission rates in post-PCI patients.

RESULT

The results of the analysis showed that the majority of respondents in the intervention and control groups were male (82%). And the average education level was respondents majority in this research education tall 56 (56 %). Whereas disease comorbidities that is diabetes mellitus distributed same. And in the intervention respondents and the group had an average age of 60 years (10.7 %). Results Analysis test homogeneity to characteristics demographics and value pre-intervention showed no significant difference between the two groups with a p-value > 0.05 (Table 1).

Table 1.

Distribution and percentage of demographic frequencies of the intervention and control groups from November 2024 to January 2025 (n=100).

Characteristics	Intervention f (%)	Control f (%)	p-value
Age			
Mean (SD)	60.7 (10.3)	57.5 (9.91)	0.813
Type Sex			
Man	40 (80)	42 (84)	0.603
Woman	10 (20)	8 (16)	
Education			
Low	1 (2)	2 (4)	0.807
Currently	20 (40)	21 (42)	
Tall	29 (58)	27 (54)	
Comorbid Diseases			
DM	25 (50)	23 (46)	0.913
HHD	19 (38)	18 (36)	
Nstemi	2 (4)	2 (4)	
CHF	2 (4)	3 (6)	
STEAM	2 (4)	4 (8)	

Table 2.

Comparison between the average compliance scores of the intervention and control groups obtained before and after the intervention was given.

Obtained before and after the intervention was given:										
External	Multimedia education pre-test				Multimedia education post test				Sig	ICE
	Intervention		Control		Intervention		Control			
	Mean	Elementary School	Mean	Elementary School	Mean	Elementary School	Mean	Elementary School		
Treatment compliance	6.02	1,059	5.94	1,202	7.38	0.635	7.12	0.824	0.441	0.0168
Self-Efficacy	42.9	1.82	41.5	2.90	69.4	5.49	55.7	3.39	0.060	0.1608
Readmisi	-	-	-	-	1.00	0.000	0.940	0.240	0.242	0.134

The results of the study were obtained from the independent sample t-test in the intervention group. to compliance treatment obtained mark p-value of 0.441 with an effect size of 0.0168 (1.68%). In the next measurement, the p-value obtained in the intervention group for *self-efficacy* was 0.060 with effect size 0.1608 (16.08 %). And on measurement readmission rate obtained mark p-value 0.242 with effect size as big as 0.134 (13.4 %) using *the Fisher Exact test*, because there was an odds ratio value <1 in the readmission rate. And a decrease in the readmission rate of 87.6% was found in post-PCI patients after being given multimedia education and a post-test for medication adherence and *self-efficacy*. In this study, *self-efficacy* in the intervention group increased, related to patient adherence to treatment, and supported by clear and targeted education. Therefore, patients who received multimedia education improved their knowledge and confidence about their disease. This led to positive self-perception, which ultimately fostered a commitment to maintaining a better

lifestyle. Patient independence was demonstrated after education, with improved coping.

DISCUSSION

Readmission of post-PCI patients is evaluated 30 days after receiving the intervention. Multimedia education represents an innovative, technology-based modification that can be considered as an alternative nursing intervention. (Nuraeni et al., 2023) emphasized that self-efficacy in CAD patients is an important concern for healthcare professionals. Self-efficacy plays a crucial role in initiating and maintaining healthy behaviors, thereby reducing the recurrence of cardiac events. Patients with higher levels of self-efficacy tend to demonstrate better disease management, improved psychological well-being and quality of life, as well as greater adherence to rehabilitation programs. Furthermore, increased self-efficacy is associated with better adherence to physical activity and dietary guidelines. Conversely, CAD patients with low self-efficacy often show poor self-care, particularly in physical exercise, which negatively impacts both their physical and psychological health. Therefore, factors influencing self-efficacy in this population should receive more attention, as many determinants may affect patients' confidence in managing their condition.

Multimedia education also serves to enhance patients' confidence in their ability to achieve health-related goals. The higher the patient's self-efficacy, the greater their adherence to treatment regimens (Nuraeni et al., 2023). Research on treatment adherence further demonstrates that CAD patients with low adherence are at higher risk of in-hospital mortality following PCI (Zhang et al., 2022). Several factors related to self-efficacy can also be linked to positive recovery outcomes and adherence to therapy, particularly among patients undergoing reperfusion therapy or cardiac rehabilitation. Self-care is essential for recognizing and managing recurrent symptoms post-PCI, thus contributing to improved physical stability and quality of life for CAD patients (Deri Ramadhan et al., 2023).

Multimedia education provides patients with clear and understandable information about CAD, which may also serve as motivation to adhere to prescribed medications. This educational method fosters positive interaction and feedback for CAD patients undergoing PCI. These findings are consistent with previous studies exploring the role of multimedia in education (Junaeti et al., 2019). Additionally, several demographic factors, such as age, sex, and education level, may influence patients' knowledge. Higher education levels are associated with better knowledge acquisition, which in turn may impact patients' understanding of their condition. Thus, multimedia education, when aligned with educational background, can enhance the implementation and evaluation of treatment adherence and self-efficacy, ultimately achieving optimal outcomes (Almeida et al., 2022).

CONCLUSION

This study involved 100 respondents in the intervention and control groups, with 82 (82%) male participants and a mean age of 60 years (SD = 10.7). Normality testing of the medication adherence questionnaire using the Kolmogorov-Smirnov test (sample size > 50) showed $p > 0.05$, indicating normally distributed data. The independent sample t-test revealed a p-value of 0.441 for medication adherence in the intervention group with an effect size of 0.0168 (1.68%). For self-efficacy, the p-value was 0.060 with an effect size of 0.1608 (16.08%). Readmission analysis using the Fisher Exact test resulted in a p-value of 0.242 and an effect size of 0.134 (13.4%), with an odds ratio <1. Notably, a reduction of 87.6% in readmission rates was observed among post-PCI patients after receiving multimedia education, alongside improved post-test scores for medication adherence and self-efficacy. The findings indicate that multimedia education has a positive effect on medication adherence, self-efficacy, and readmission rates in post-PCI CAD patients.

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