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The Influence of Education on Anxiety in Acute Myocardial Infarction (AMI) Patients at Prof. Dr. Margono Soekarjo Regional Hospital

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ABSTRACT

Acute Myocardial Infarction (AMI) is one of the cardiac diseases that can arise when blood flow in the coronary artery is restricted, depriving the heart muscle of oxygen. Anxiety is a common mental health problem in Acute Myocardial Infarction (AMI) patients. One of the many treatments for anxiety that is accessible is using education. Prevention, medical care, and lifestyle modifications like nutrition, stress reduction, exercise, and quitting smoking are all covered in the health education offered. This study aims to determine whether providing education has an effect on individuals with acute myocardial infarction (AMI) in terms of anxiety. With a sample size of 44 participants, both intervention and control groups received education in the form of a 5-minute video as part of the study's Quasy Experimental Nonequivalent Control Group research design. The State Trait Anxiety Inventory (STAI), a questionnaire comprising 40 statement questions, was the instrument employed in this investigation. Data analysis of this study used the Wilcoxon Test and the Mann Whitney Test. The findings of this study indicate that there is an impact of educational programs on anxiety in acute myocardial infarction (AMI) patients (P=0.042 < 0.05).

Keywords : education, anxiety, Myocardial Infarction (MI)

1. INTRODUCTION

Cardiovascular Disease (CVD) is a leading cause of global mortality. According to data from the American Heart Association (AHA, 2020), nearly 18.6 million people worldwide died from heart disease in 2019, representing a 17.1% increase over the last decade (Virani et al., 2020). In 2019, heart disease became the leading cause of death in Asia, resulting in 10.8 million deaths, comprising 35% of all deaths in Asia (Zhao, 2021). Data from the 2018 Basic Health Research (Riskesdas) indicates that approximately 1 million people in Indonesia suffer from heart disease. In Central Java province, the prevalence of heart disease is approximately 132,565 individuals. The highest prevalence of heart disease patients in Indonesia is found in West Java province, totaling 186,809 individuals, while the lowest prevalence is in North Kalimantan province with 2,733 individuals.

Acute Myocardial Infarction (AMI), also known as a heart attack, is a cardiovascular condition that occurs when blood flow in the coronary arteries becomes blocked, leading to insufficient oxygen supply to the heart muscle and resulting in infarction (Melastuti & Ramadini, 2021). The blockage in the coronary arteries is typically caused by plaque, cholesterol, and the buildup of fats, which leads to blood clotting and, in turn, restricts blood flow to the heart. Common symptoms of myocardial infarction include

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chest pain, left shoulder pain radiating to the neck or along the jawline, shortness of breath, profuse sweating, dizziness, muscle weakness, and nausea and vomiting (Lu et al., 2015).

The primary complications of myocardial infarction include life-threatening arrhythmias and cardiac arrest (Rosdahl & Kowalski, 2017). Risk factors for myocardial infarction encompass lifestyle, environmental, psychosocial factors, hypertension, diabetes, and obesity (Zhan et al., 2019). There are other risk factors that can exacerbate the condition, such as psychological factors like anxiety, depression, and stress, which can influence the development and progression of heart disease (Rustandi & Gumilang, 2020).

Myocardial infarction often occurs suddenly, and in the early stages, patients may experience chest pain that can initiate fear and anxiety (Siwi & Hidayat, 2019). According to the American Psychological Association, anxiety is an emotion characterized by feelings of tension, worry, and physical changes like increased blood pressure. Anxiety in acute myocardial infarction patients is related to the fear of death, intense pain, shortness of breath, as well as complications such as recurrent heart attacks, recurrent ischemia, and ventricular fibrillation (Aburuz & Masa'Deh, 2017).

In previous research by Mal et al., (2019) using the Hospitalized Anxiety and Depression Scale (HADS) instrument, it was found that 52.83% of patients experienced anxiety. In the study conducted by Mal et al., (2019) this anxiety is related to tense situations or stress caused by acute heart events that impact an increased risk of cardiac death. Daily activities like exercise and adherence to therapy can help patients reduce their anxiety. There are several ways to address anxiety, such as providing aromatherapy, music therapy, massage, and education.

Education programs for myocardial infarction patients have not seen significant development. According to the World Health Organization (WHO), health education is an opportunity for learning that encompasses various forms of communication designed to improve health literacy, including increasing knowledge and developing life skills that enhance the health of individuals and communities. Several studies indicate that heart health education programs can reduce levels of anxiety and depression and aid in the rehabilitation phase of patients with acute myocardial infarction (Ab Manap et al., 2018). Previous research by Ab Manap et al., (2018) shows that education programs statistically reduce anxiety, stress, and depression with a score of $p < 0.001$. Multimedia-based education, such as providing videos, is effective for heart patients because it is a simple and cost-effective method that requires minimal time and energy, and learning can be enhanced and easily absorbed when educational information is presented through audiovisual means compared to visual-only methods like leaflets or booklets.

Nurses play a crucial role in promoting and maintaining health, as well as reducing anxiety levels through the implementation of health education programs designed for patients with heart disease. The health education provided includes prevention, medical care, and lifestyle changes such as diet, stress management, exercise, and smoking cessation (Tuna & Pakyüz, 2021).

The general objective of this research is to determine the influence of education on anxiety in patients with Acute Myocardial Infarction at Prof. Dr. Margono Soekarjo Hospital.

2. RESEARCH METHODS

This research is a quantitative experimental approach with a Quasi Experimental Nonequivalent Control Group Design. There were 44 respondents in total, divided into 2 groups: 22 in the control group and 22 in the intervention group. The sampling technique used in this research was purposive sampling. The inclusion criteria for this study include: 1) Patients with Acute Myocardial Infarction (AMI) who experience anxiety and are hospitalized in a stable condition; 2) Willing to be respondents and sign an informed consent.

In this study, there are two variables: education as the independent variable and anxiety as the dependent variable. The research employed the State Trait Anxiety Inventory (STAI) questionnaire instrument, consisting of 40 statements, and a 5-minute educational video

about preventing recurrent AMI attacks. Data were collected through two questionnaires. The first questionnaire covered demographic information, including age, gender, family medical history, and education level. The second questionnaire was the State Trait Anxiety Inventory (STAI) questionnaire, with its validity and reliability confirmed. The validity test value for the State (S) section was 0.60, and the Trait (T) section was 0.73, with a reliability value of 0.93, indicating high reliability for the STAI questionnaire (McDowell, 2009).

A preliminary educational video, based on the literature, titled "Efforts to Prevent Recurrent Acute Myocardial Infarction (AMI) Attacks," was prepared by the researcher. The validity of the educational video was confirmed by three nursing master's experts and then made accessible to the respondents by the researcher by uploading it to YouTube. The video contains the following points:

1. Definition of Acute Myocardial Infarction (AMI)
2. Signs and Symptoms of Acute Myocardial Infarction (AMI)
3. Risk Factors for Acute Myocardial Infarction (AMI)
4. Healthy Lifestyle Changes for Acute Myocardial Infarction (AMI) Patients
5. Breathing Relaxation Treatment

This research utilized various data collection techniques, including a pre-test conducted on the first day, where respondents were given a questionnaire to measure anxiety levels before the intervention. The intervention consisted of providing educational videos on the first and second days. A post-test was conducted on the third day by providing respondents with a questionnaire to measure anxiety levels after the intervention. Data analysis in this study included univariate analysis to determine respondent characteristics, the Shapiro-Wilk normality test to assess data distribution, and bivariate analysis using the Wilcoxon and Mann Whitney tests to determine the impact of education on anxiety levels in patients with Acute Myocardial Infarction (AMI) at Prof. Dr. Margono Soekarjo Hospital. This research received ethical approval from Prof. Dr. Margono Soekarjo Regional Hospital based on letter number 420/08089. In this study, the researcher also obtained informed consent from respondents to collect data and explained the data collection procedures, with respondents signing the informed consent.

3. RESULT AND DISCUSSION

3.1 Results

Respondent Characteristics

Tabel 1. Distribution of respondent characteristics, including age, gender, family medical history, and education level in the cardiac ward of RS Margono Soekarjo in 202 (n = 44)

No	Variable	Intervention		Control	
		f	%	f	%
1	Age				
	25-35 years (early adult)	1	4.5	-	-
	36-45 years (late adult)	4	18.2	2	9.1
	46-55 years (early elder)	6	27.3	10	45.5
	56-65 years (late elder)	4	18.2	4	18.2
	>65 years (elderly)	7	31.8	6	27.3
Total		22	100	22	100
2	Gender				
	Male	14	63.6	15	68.2
	Female	8	36.4	7	31.8
Total		22	100	22	100
3	Family Medical History				
	Yes	3	13.6	9	40.9
	No	19	86.4	13	59.1
Total		22	100	22	
4	Education Level				
	No School	2	9.1	1	4.5
	Primary Education (SD-SMP)	16	72.7	15	68.2
	Secondary Education (SMA)	4	18.2	5	22.7
	Higher Education	-	-	1	4.5
Total		22	100	22	100

Tabel 2. Distribution of anxiety levels in respondents before education in the cardiac ward of RS Prof. Dr. Margono Soekarjo in 2021 (n = 44)

Group	Min	Max	Mean	STD. Deviation
Intervention	40	140	104.00	29.135
Control	67	128	105.50	18.324

Group	Categori							
	Not Anxious		Mild Anxiety		Moderate Anxiety		Severe Anxiety	
	n	%	n	%	n	%	n	%
Intervention	6	27	-	-	11	50	5	23
Control	3	14	2	9	17	77	-	-

Tabel 3. Distribution of anxiety levels in respondents after education in the cardiac ward of RS Prof. Dr. Margono Soekarjo in 2021 (n = 44)

Group	Min	Max	Mean	STD. Deviation
Intervention	35	128	85.91	27.466
Control	40	128	100.77	19.808

Group	Kategori					
	Not Anxious		Mild Anxiety		Moderate Anxiety	
	n	%	n	%	n	%
Intervention	6	27	10	46	6	27
Control	2	9	5	23	15	68

Tabel 4. Distribution of Wilcoxon test results in the intervention group and control group (n = 22)

Group	z	P-value
Intervention	-4.109	0.000
Control	-2.478	0.013

Tabel 5. Distribution of Mann Whitney test results in the intervention group and control group (n = 22)

Group	z	P-value
Pre-test	-0.940	0.347
Post-test	-2.031	0.042

3.2 Discussion

Respondent Characteristics

Table 1 above shows that the majority of patients' ages fall into the category of early elderly, which is 46-55 years, with 16 patients (36.4%). Aging leads to the stiffening of the heart, blood vessels, and their structural components, resulting in decreased elasticity of arterial blood vessels. In older blood vessels, the heart's ability to pump blood also decreases (American Heart Association, AHA 2021). Furthermore, unhealthy lifestyles such as smoking, lack of exercise, and poor dietary habits are also associated with the occurrence of AMI.

The most common gender is male, with 28 patients (63.6%). Supported by research (Anggraeni & Syafriati, 2022), while women are vulnerable to heart disease at the age of 65 or after menopause. This occurs due to the role of estrogen hormones in protecting women from various heart diseases.

The majority of patients have no family history of the disease, with a total of 33 patients (75%). This finding is consistent with the study by Tappi et al., (2018), which yielded a p-value of 0.0203 > 0.05, indicating no significant relationship between a family history of disease and the prevalence of heart disease.

However, other genetic risk factors commonly experienced by respondents in this study include hypertension, diabetes mellitus, and high cholesterol.

According to the study by Kurnia & Prayogi, (2015), genetic risk factors that can trigger Acute Myocardial Infarction (AMI) can be inherited from close family members such as grandparents and parents. Additionally, a shared family lifestyle can also play a role. Lifestyle factors such as dietary habits within a family can influence an individual's health.

The average education level attained by patients is primary education (elementary to junior high school), with 32 patients (72.7%). Individuals with lower levels of education have limited knowledge and information, which may result in lower motivation to maintain their health. In contrast, individuals with higher education levels find it easier to acquire

knowledge and information, leading to a desire to maintain their health and improve their quality of life (Karundeng et al., 2018). The researcher assumes that the higher a person's level of education, the easier it is to acquire, absorb, and process information, ensuring effective delivery of education.

Anxiety Levels of Respondents Before Education

Table 2 shows that the distribution of anxiety levels among respondents before receiving education in both the intervention and control groups is predominantly moderate anxiety. In the intervention group, 11 respondents (50%) experienced moderate anxiety, while in the control group, 17 respondents (77.3%) reported moderate anxiety.

Psychological reactions such as anxiety and depression are common in AMI patients. Anxiety in AMI patients has received less attention, even though its prevalence is generally higher than that of depression. Several studies indicate that a significant proportion of AMI patients experience persistent and unrelenting anxiety, making it an issue that should not be underestimated (Rustandi & Gumilang, 2020). The most frequently reported statements in the STAI questionnaire were "I feel worried" and "I feel nervous and anxious," which are related to the recurrence of the patient's illness and the length of hospitalization. In contrast, the statement "I feel satisfied," related to the facilities and the comfort of the patient's room, had the lowest scores. The researcher assumes that the respondents' lack of knowledge about their condition leads to anxiety, resulting in statements like "I feel worried" and "I feel nervous and anxious" receiving the highest scores. On the other hand, the statement "I feel satisfied" has the lowest score because it pertains to the level of comfort and tranquility in the patient's hospital environment.

Anxiety Levels of Respondents After Education

Table 3 shows the distribution of anxiety levels among respondents after receiving the audiovisual education program. In the intervention group, the majority reported mild anxiety, with 10 respondents (45.5%), while in the control group, the majority reported moderate anxiety, with 15 respondents (68.2%). This indicates that the audiovisual education program is effective for patients with Acute Myocardial Infarction (AMI).

According to Kokcu et al., (2019), their research demonstrated the effectiveness of web-based education in reducing anxiety and depression in AMI patients, with a result of $p < 0.001$. This is because web-based education on safe medication use, proper nutrition, and physical activity has a positive impact on the emotional well-being of AMI patients.

Zhamaliyeva (2023), reported a significant reduction in anxiety and depression on the HADS scale in the experimental group. Anxiety scores decreased by 2.0 points, and depression scores decreased by 1.9 points ($P < 0.05$). The control group also showed reductions, with anxiety scores decreasing by 1.5 points and depression scores decreasing by 1.2 points ($P < 0.05$). This indicates that the education intervention provided by trained healthcare professionals can have a positive impact on the mental health outcomes of patients participating in cardiac rehabilitation programs. Clinically, it can increase motivation for exercise, promote healthier lifestyles, and manage risk factors, ultimately reducing the risk of recurrence.

A study by Ahmadi et al., (2022), suggests that multimedia education in the form of videos containing information about etiology, heart-healthy diets, appropriate heart medication use, stress management strategies, and physical activities effectively enhances self-efficacy in patients diagnosed with heart disease, with a result of $p < 0.001$. Multimedia-based education is effective for heart patients because it is a simple and cost-effective method that requires minimal time and energy. It can empower patients to modify their behavior and improve their understanding of their condition.

Another study by Gagné et al., (2019), states that patients who received face-to-face interventions through videos containing information about heart conduction systems, the difference between normal heart rhythms and atrial fibrillation rhythms, types of atrial

fibrillation, risk factors, symptoms of atrial fibrillation, signs of stroke, and both medical and non-medical treatment options showed a greater improvement in knowledge about atrial fibrillation compared to patients who did not receive this intervention, with a result of p = 0.014 < 0.05. This is because learning can be enhanced when educational information is presented in an audiovisual format, as opposed to solely visual methods like leaflets or booklets. The researcher assumes that multimedia-based education in the form of video is one of the effective non-pharmacological therapies for heart patients because it's a simple method that requires minimal time and energy. It's also easily accessible through electronic devices such as tablets and smartphones.

Analysis of the Effect of Education on Anxiety in Patients with Acute Myocardial Infarction (AMI) at RS Prof. Dr. Margono Soekarjo

This study aims to determine whether there is an effect of providing an education program on the anxiety of patients with Acute Myocardial Infarction (AMI) at RS Prof. Dr. Margono Soekarjo.

Based on Table 4 in this study, the results show that the Wilcoxon test in the Intervention group yielded P = 0.000 < 0.005, which means that the null hypothesis (Ho) is rejected, and the alternative hypothesis (Ha) is accepted. Therefore, it can be concluded that there is an effect of education on the anxiety of patients with Acute Myocardial Infarction (AMI) in the Intervention group.

Table 5 in this study reveals the results of the Mann Whitney test in the Post-test group, which yielded P = 0.042 < 0.05. This indicates that there is a difference between the intervention group and the control group regarding the effect of education on the anxiety of patients with Acute Myocardial Infarction (AMI) at RS Prof. Dr. Margono Soekarjo.

Based on the interpretation of Tables 4 and 5, it can be concluded that there is an effect of providing an education program on the anxiety of patients with Acute Myocardial Infarction (AMI) at RS Prof. Dr. Margono Soekarjo. This education program is effective when given to patients with Acute Myocardial Infarction (AMI) in stable conditions.

Education is an intervention process aimed at developing skills and has the primary goal of improving the health status of patients, enabling them to perform specific exercises (Purnama, 2020). In their research, Podvorica et al. (2021) emphasized the essential role of nursing education, stating that nursing education sessions can enhance patients' knowledge about self-care for their disease and convince patients to adhere to lifestyle changes.

Patient education is a crucial component of heart disease care and should be delivered through effective strategies and well-evaluated. Patients with heart disease require education to adapt to their chronic conditions and to be able to take care of themselves and self-manage effectively.

According Sassen (2017) in her book titled "Nursing: Health Education and Improving Patient Self-Management" emphasizes the importance of educating patients with cardiovascular diseases, including medication adherence, vigilance regarding high-fat foods, and recommendations for regular physical activities such as exercise. The findings of this study align with research conducted by Ab Manap et al., (2018) in their study titled "Effect of an Education Program on Cardiovascular Health Index among Patients with Myocardial Infarction: A Preliminary Study," stating that there was a statistically significant decrease in anxiety, stress, depression, body mass index, and smoking status with a result of p < 0.001 between the pre-test and post-test. Patients who received the educational program experienced a reduction in anxiety levels, as this education increased patients' knowledge, reduced psychological uncertainty, and helped myocardial infarction patients cope with lifestyle changes.

Another study by Suarningsih et al., (2020), titled "Effect of an Education Program and Traditional Music on Anxiety in Patients with Myocardial Infarction," showed that anxiety in the intervention group significantly decreased compared to the control group with a t-value of -10.34 and p < 0.05. This research provides empirical evidence supporting the

effectiveness of the education program and traditional music in reducing anxiety experienced by myocardial infarction patients.

This is due to the relaxation process that enhances patients' understanding of their condition during the educational program, indicating that the implementation of this intervention during hospitalization is beneficial for patients recovering from myocardial infarction.

A study by Mohammadi et al., (2021), found no significant differences in the average scores of quality of life and anxiety in heart patients between the control group and the intervention group before the educational intervention. However, after the educational intervention, there was a significant difference in the average scores of quality of life and anxiety in the intervention group with a value of ($P < 0.05$). Based on this research, it can be concluded that multimedia education is effective in improving the quality of life and reducing anxiety in heart failure patients. This is because multimedia education can enhance patients' knowledge, leading to better self-care behaviors and improved quality of life.

According Zhamaliyeva (2023), in her study titled "Educational Intervention Effects on Depression and Anxiety in Patients After Myocardial Infarction: A Randomized Controlled Trial," the experimental group showed a significant decrease in anxiety and depression on the HADS scale. Anxiety scores decreased by 2.0 points, and depression scores decreased by 1.9 points ($P < 0.05$). The control group also showed a decrease, with anxiety scores decreasing by 1.5 points and depression scores decreasing by 1.2 points ($P < 0.05$). The results of the study indicate that a structured educational intervention program provided by trained healthcare professionals can have a positive impact on the mental health outcomes of patients participating in cardiac rehabilitation programs. This clinical improvement can enhance motivation for exercise, promote healthier lifestyles, and help manage risk factors, ultimately reducing the risk of recurrence.

Multimedia-based education in the form of video presentations is an effective non-pharmacological therapy for heart patients. It is considered simple, cost-effective, requiring minimal time and energy, and easily accessible through electronic media such as tablets and smartphones. Learning can be enhanced and absorbed more easily when educational information is provided through audiovisual means, compared to visual-only methods like leaflets or booklets. In addition to education, the reduction of anxiety in patients is also associated with the administration of anxiolytic and antidepressant medications Alexandri et al., (2017), revealed in their study that 63.64% of patients with high anxiety levels used anxiolytics, while 22.08% of patients with high anxiety levels used antidepressants. It is known that anxiolytics and antidepressants are types of medications used to help alleviate anxiety associated with various anxiety disorders.

The mechanism of action of anxiolytic drugs is to target key chemical messengers in the brain, which is believed to help reduce abnormal stimuli (Cochrane, 2019).

The researcher's assumption regarding the impact of education on anxiety in patients with Acute Myocardial Infarction (AMI) at RS Prof. Dr. Margono Soekarjo is that intervention in the form of education can improve respondents' knowledge, enhance motivation for exercise, and promote healthier lifestyle changes. Therefore, risk factors that can lead to relapse and subsequently cause patient anxiety can be controlled.

CONCLUSION

Characteristics of the respondents based on age show that the majority fall into the early elderly category, specifically in the 45-55 age range, with a total of 16 patients (36.4%). The most prevalent gender category is male, accounting for 28 patients (63.6%). A significant portion of the patients, 33 in total (75%), do not have a family history of inherited diseases. Furthermore, the education level achieved by the patients is predominantly at the primary education level (elementary and junior high school), amounting to 32 patients (72.7%).

Before receiving education, the majority of respondents experienced moderate anxiety, totaling 29 patients (66.0%).

Even after the education, most respondents still fell into the moderate anxiety category, with 21 patients (47.7%).

The results suggest that there is an influence of education on anxiety levels in patients with Acute Myocardial Infarction (AMI) at RS Prof. Dr. Margono Soekarjo, with a significance level of P = 0.042, which is less than 0.05.

RECOMMENDATION

It is hoped that this educational approach can be used as an effective non-pharmacological method in the management of anxiety, particularly for patients with heart diseases, especially those diagnosed with Acute Myocardial Infarction (AMI).

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