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The Effect of Acupressure Therapy and Classical Music on Anxiety Levels and Vital Signs in Myocardial Infarction Patients with Pci (Percutaneous Coronary Intervention) Indications at Kudungga Hospital

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Abstract

Myocardial infarction is the leading cause of morbidity and mortality, with PCI as the primary therapy. Anxiety in PCI patients needs to be treated comprehensively. This study aims to analyze the effect of acupressure and classical music on anxiety and vital signs of Myocardial Infarction patients with PCI indications at Kudungga Hospital. Quantitative research with true pretest-posttest group design experiments on 27 elective PCI patients at Kudungga Hospital. Respondents were divided into three groups (acupressure, classical music, control) by simple random sampling. Independent variables: acupressure and classical music; dependent variables: anxiety and vital signs (diastolic systolic blood pressure, pulse rate, respiratory rate). Data were analyzed using paired t-test. The research will be carried out in May 2025. Research Ethics Number: 0823415/EC/KEPK/I/06/2025. The results of the analysis showed that there was an effect of acupressure therapy on anxiety levels ($p=0.000$), systolic blood pressure ($p=0.001$), diastolic ($p=0.014$), pulse frequency ($p=0.004$), and respiratory frequency ($p=0.002$). There was an effect of classical music therapy on anxiety ($p=0.000$), systolic blood pressure ($p=0.000$), diastolic ($p=0.0023$), pulse frequency ($p=0.029$), and cardiac frequency ($p=0.023$). The results of the study showed that acupressure and classical music had a significant effect on reducing anxiety and vital signs in myocardial infarction patients with PCI (*Percutaneous Coronary Intervention*) indications at Kudungga Hospital. The results of the Post hoc and Tukey analysis Acupressure is more effective in reducing anxiety, pulse, and breathing, while classical music is more effective in lowering systolic and diastolic blood pressure. No changes to the control group. Acupressure and classical music interventions have been proven to be effective in reducing anxiety levels, blood pressure, pulse frequency, and respiratory frequency of myocardial infarction patients with PCI indications at Kudungga Hospital, while in the control group the decrease was not significant. Specifically, acupressure is most effective at lowering anxiety, pulse, and breathing, while classical music is most effective at lowering blood pressure.

Keywords: Acupressure, Classical music, Anxiety, Signs of vitra, Myocardial infarction.

Introduction

Acute Myocardial Infarction (AMI) or Heart Attack is one of the leading causes of morbidity and mortality worldwide (Aggarwal et al., 2021). Every year, millions of lives are lost due to complications arising from various cardiovascular conditions, with acute myocardial infarction (AMI) or heart attack being among the most fatal. This condition requires intensive management, both medically and through supportive therapies, because of its severe impact on cardiac function. According to data from the World Health Organization (WHO) in 2020, cardiovascular diseases, including myocardial infarction, accounted for approximately 32% of all global deaths, with most cases occurring in developing countries (WHO, 2024).

Diseases related to the cardiovascular system are the number one cause of death worldwide. Around 17 million people died from cardiovascular diseases in 2019, representing 31% of all global deaths. Among these, coronary heart disease (CHD) has the highest mortality and disability rates. Each year, it is estimated that approximately 620,000 Americans experience a first coronary heart attack, while about 295,000 suffer a recurrent attack. These data indicate that optimal medical and non-medical therapeutic interventions are crucial to reducing the incidence and associated complications (WHO, 2024).

Although data indicate a decline in the number of myocardial infarction cases from 2021 to 2022, the mortality rate associated with this condition remains high. Data from June 2023 showed that deaths due to AMI still occurred, with an even higher percentage relative to the number of cases. This reflects the severity of the condition and the suboptimal holistic management of patients. It emphasizes that medical therapy alone is insufficient and must be complemented by supportive therapies that address both the psychological and physiological aspects of patients. One of the main causes of the high morbidity and mortality rates of heart disease in both developed and developing countries is acute myocardial infarction (AMI). AMI is defined as irreversible myocardial injury due to ischemia, resulting in necrosis of a substantial portion of the cardiac muscle (generally exceeding 1 cm). The term *acute* indicates that the infarction occurs within less than 3–5 days, with predominant neutrophil infiltration (Mechanic et al., 2023). The main mechanism involves

reduced blood supply to the cardiac muscle due to atherosclerotic plaque rupture—a critical process that requires immediate management through invasive therapy and continuous supportive care (Ojha, Dhamoon, and Chapagain, 2021).

This phenomenon is not only a concern in developed countries with well-established healthcare systems but is also a significant burden in developing nations, including Indonesia. According to the 2023 Indonesian Health Survey (SKI), the prevalence of heart disease, including myocardial infarction and acute coronary syndrome, reached 0.85%. While this percentage may appear small, in absolute numbers, it represents a large population of affected individuals, posing an ongoing challenge to the national healthcare system. More detailed data reveal that the highest prevalence rates were found in regions such as the Special Region of Yogyakarta (1.67%), Central Papua (1.65%), and Jakarta Capital Region (1.56%), followed by East Kalimantan with 1.08%. These findings indicate that heart disease is not merely an individual medical issue but also a public health concern that requires serious and sustained attention (Ministry of Health, 2023).

Pathophysiologically, acute myocardial infarction (AMI) occurs when blood flow to a portion of the heart muscle is suddenly obstructed, causing irreversible damage to cardiac tissue due to prolonged oxygen deprivation. This process can be likened to a rapid and sharp “attack” on the heart, in which previously healthy muscle cells die and lose their primary function. Such a condition demands prompt and precise intervention to minimize tissue damage, as injured heart muscle cannot regenerate naturally. Worldwide, acute myocardial infarction remains a leading cause of hospitalization and cardiovascular mortality, necessitating continuous preventive and therapeutic efforts to optimize outcomes.

The management of acute myocardial infarction (AMI) is a complex process that requires a multidisciplinary approach to achieve optimal results. One of the main treatment methods for AMI is **Percutaneous Coronary Intervention (PCI)**—a minimally invasive procedure designed to open blocked coronary arteries caused by atherosclerotic plaque buildup. PCI aims to restore blood flow to the heart muscle, thereby preventing further damage and improving patient prognosis. This procedure has been proven to significantly reduce mortality rates,

the risk of recurrent heart attacks, and the deterioration of left ventricular function (Khan and Ludman, 2022).

PCI can be performed in two contexts: **primary (emergency)** and **elective (scheduled)**. In patients with indications for primary PCI, the procedure is performed immediately after the diagnosis of AMI to minimize cardiac damage. However, the focus of this study is on **elective PCI patients**, those undergoing the procedure in a planned and stabilized condition. Elective PCI patients generally have more stable physiological conditions, allowing for a more measured and structured intervention. This provides an opportunity to address the psychological aspects of patient care, particularly the anxiety that may arise prior to the procedure.

Nevertheless, the effectiveness of PCI therapy is greatly influenced by both the physiological and psychological conditions of patients—before, during, and after the procedure. One of the major challenges in this process is **patient anxiety**, which can disrupt physiological stability and reduce the success rate of medical interventions (PERKI, 2022). Therefore, additional **supportive therapies** are needed to enhance overall clinical outcomes.

The **psychological condition** of elective PCI patients is a key consideration, as anxiety can affect the overall therapeutic outcome. High anxiety levels can trigger activation of the **sympathetic nervous system**, potentially increasing blood pressure, heart rate, and myocardial oxygen consumption. This may worsen the patient's condition and increase the risk of serious complications such as arrhythmias and heart failure (Zhang et al., 2023). Thus, anxiety management becomes an integral component of comprehensive therapeutic strategies for elective PCI patients.

Anxiety in patients undergoing medical procedures, particularly elective PCI, often manifests as psychological responses that can influence their physical condition. Before entering the operating room, many patients report high levels of anxiety, which can be measured using standardized anxiety scales such as the **Hamilton Anxiety Rating Scale (HAM-A)**. Studies have shown that the prevalence of anxiety among elective PCI patients ranges from **30% to 70%**, depending on individual and situational factors. This anxiety is not only emotional but also has significant physiological effects (Antos et al., 2024).

When patients experience anxiety, the sympathetic nervous system becomes activated, resulting in increased heart rate, blood pressure, and respiratory rate. Prior to the procedure, patients' **vital signs (VS)** often show marked fluctuations. For instance, blood pressure may rise by as much as **20 mmHg** above baseline, and heart rate may spike to **100–120 bpm**, depending on the level of anxiety experienced. These fluctuations in vital signs can persist as patients enter the operating room, where tension and uncertainty typically intensify. Research indicates that significant changes in vital signs—such as unstable blood pressure and respiratory rate—may increase the risk of complications during and after the procedure (Zhang et al., 2023).

In addressing these challenges, **non-pharmacological interventions** such as **acupressure** and **classical music therapy** have emerged as promising solutions. Acupressure therapy, which involves stimulating specific points on the body, has been proven effective in reducing anxiety levels and stabilizing vital signs in patients with cardiovascular disorders. A study by Wang et al. (2023) demonstrated that acupressure can reduce anxiety by up to **40%** while stabilizing blood pressure and heart rate in patients undergoing invasive procedures.

Complementary therapies such as **acupressure and music therapy** have gained increasing attention in the management of anxiety and the enhancement of patients' quality of life, particularly among those undergoing invasive procedures such as **elective Percutaneous Coronary Intervention (PCI)**. These therapies offer non-pharmacological approaches that help alleviate anxiety and stabilize vital signs without causing harmful side effects, making them ideal options for high-risk patients (Bernatzky et al., 2021).

Acupressure, a technique rooted in traditional Chinese medicine, involves stimulating specific points on the body to restore energy balance and improve organ function. Research indicates that acupressure activates the **parasympathetic nervous system**, which helps calm the body and reduce stress responses. In the context of elective PCI patients, acupressure can help lower anxiety levels by up to **40%** and stabilize vital signs such as blood pressure and heart rate. Moreover, acupressure improves blood circulation and reduces muscle tension—beneficial effects for patients experiencing stress before undergoing medical procedures (Wang et al., 2023).

Classical music therapy has also been shown to exert a significant calming effect on patients with various medical conditions. Classical music can influence the **limbic system** of the brain, which plays a crucial role in regulating emotions and stress responses. A study by T. Zaatari et al. (2024) revealed that classical music therapy can reduce anxiety levels by up to **50%** in ICU patients with heart disease, without causing adverse effects on other health parameters. Music creates a serene and comfortable atmosphere, helping patients feel more relaxed and better prepared for medical procedures. Furthermore, listening to music enhances the production of **endorphins**, which act as natural pain relievers and promote a sense of well-being.

A study by **Bal and Gun (2024)** also demonstrated that acupressure is effective in reducing anxiety and stabilizing vital signs among patients with cardiovascular disorders. The combination of these two therapies is considered safe, non-invasive, and easy to implement in clinical settings as a complementary approach to conventional medical treatment.

The **safety** of these therapies is a major consideration, particularly for high-risk patients. Both acupressure and classical music therapy have been proven safe for use in this population without causing significant adverse effects. Research conducted by **Derya İster and Altınbaş (2022)** revealed that acupressure is not only effective in reducing anxiety but also does not negatively interact with medications commonly used by patients with cardiovascular conditions. Similarly, classical music therapy has no contraindications and can be widely applied, making it an excellent option for patients with comorbidities or drug sensitivities (Bal and Gun, 2024).

This study aims to **evaluate the effects of complementary therapies**, specifically **acupressure and classical music**, on anxiety levels and the stability of vital signs among patients with **acute myocardial infarction (AMI)** indicated for **elective Percutaneous Coronary Intervention (PCI)**. By dividing the participants into three groups—an acupressure group, a classical music group, and a control group without intervention—this research seeks to provide a clearer understanding of the effectiveness of each therapy in managing anxiety and supporting patient recovery. Furthermore, the study aims to identify the potential positive impact of these two therapies on clinical outcomes and to offer

evidence-based recommendations for a more holistic and integrated nursing practice.

The urgency of this research cannot be underestimated, given the persistently high mortality and complication rates associated with myocardial infarction. Although the number of AMI cases has shown a gradual decline in recent years, the mortality rate remains high, indicating that more comprehensive and effective management strategies are still needed. Anxiety experienced by elective PCI patients may contribute to physiological instability that can worsen their condition; thus, anxiety management becomes an integral component of an effective care strategy. Integrating **non-pharmacological interventions**, such as acupressure and classical music therapy, is expected to help reduce anxiety, stabilize vital signs, and improve overall clinical outcomes.

Based on the above discussion, it can be concluded that **complementary therapies** such as **classical music and acupressure** hold great potential to be applied as supportive interventions in the management of **acute myocardial infarction patients**, particularly those undergoing **elective PCI**. Therefore, the researcher is interested in conducting a study entitled: "The Effect Of Acupressure Therapy And Classical Music On Anxiety Levels And Vital Signs In Myocardial Infarction Patients With Pci (*Percutaneous Coronary Intervention*) Indications At Kudungga Hospital."

Materials and Method

The research design employed in this study is quantitative research using a true experimental method with a pretest–posttest group design approach. This experimental study consists of two groups: an intervention group and a control group. The study aims to analyze the effectiveness of acupressure and classical music therapy on anxiety levels and vital signs.

Data collection was carried out using pre- and post-intervention questionnaires administered to both the intervention and control groups. Initially, a pretest was conducted to assess baseline conditions, followed by a posttest to determine the final outcomes and evaluate the influence of the interventions. The intervention group received both acupressure and classical music therapy, while the control group was provided with educational counseling only, using informational leaflets.

The population in this study consisted of all patients diagnosed with myocardial infarction who met the inclusion criteria: having an indication for elective PCI (Percutaneous Coronary Intervention), being hemodynamically stable, and able to communicate effectively at Kudungga Regional General Hospital, totaling 144 respondents.

The sample size was determined using the Federer formula for experimental designs with one replication (R_1) per group: $(n-1)(t-1) \geq 15(n-1)(t-1) \geq 15$ where n represents the number of subjects per group, and t represents the number of

treatment groups. The sampling technique employed in this study was random sampling.

Results

1. Respondent Characteristics

This study was conducted among a subset of patients diagnosed with myocardial infarction who met the inclusion criteria, namely having an indication for elective PCI, being hemodynamically stable, and able to communicate effectively, at Kudungga Regional General Hospital. The distribution of respondent characteristics is presented in Tables 1, 2, and 3.

Table 1. Characteristics of Research Subjects Based on Age, Gender, Smoking Status, and Educational Level in the Acupressure Therapy Group at Kudungga Regional General Hospital, 2025 (n = 27)

Characteristics	n	%
Age		
31-40 years old	4	44,4
41-50 years old	3	33,3
51-60 years old	2	22,3
> 60 years old	0	0,0
Gender		
Man	8	88,9
Woman	1	11,1
Smoke		
No	1	11,1
Ya	8	88,9
Final education		
SD	0	0,0
SMP	3	33,3
SMA	3	33,3
S1	3	33,4

Table 1 presents the characteristics of research subjects based on age, gender, smoking history, and educational background in the **acupressure therapy group**. In the **age category**, most respondents were **31–40 years old**, totaling **4 respondents (44.4%)**. Based on **gender**, the majority of respondents were **male**, comprising **8 respondents (88.9%)**. Regarding **smoking history**, most respondents were **smokers**, also **8 respondents (88.9%)**. As for the **educational background**, respondents were evenly distributed among **junior high school, senior high school, and undergraduate education levels**, with **3 respondents (33.3%)** in each category.

Table 2. Characteristics of Research Subjects Based on Age, Gender, Smoking Status, and Educational Level in the Classical Music Therapy Group at Kudungga Regional General Hospital, 2025 (n = 27)

Characteristics	n	%
Age		
31-40 years old	2	22,2
41-50 years old	5	55,6
51-60 years old	2	22,2
> 60 years old	0	0,0
Gender		
Man	8	88,9
Woman	1	11,1
Smoke		
No	2	22,2
Yes	7	77,8
Final education		
SD	1	11,1
SMP	3	33,3
SMA	5	55,6
S1	0	0,0

Table 2 presents the characteristics of research subjects based on age, gender, smoking history, and educational background in the **classical music therapy group**. In the **age category**, most respondents were **41–50 years old**, totaling **5 respondents (55.6%)**. Based on **gender**, the majority of respondents were **male**, comprising **8 respondents (88.9%)**. Regarding **smoking history**, most respondents were **smokers**, with **7 respondents (77.8%)**. As for the **educational background**, the majority of respondents had completed **senior high school education**, totaling **5 respondents (55.6%)**.

Tabel 3 Karakteristik Subjek Penelitian Berdasarkan Usia, Jenis Kelamin, Merokok dan Pendidikan Terakhir Pada Kelompok Kontrol (leaflet) di RSUD Kudungga Tahun 2025 (n=27)

Characteristics	n	%
Age		
31-40 years old	1	11,1
41-50 years old	3	33,3
51-60 years old	4	44,4
> 60 years old	1	11,1
Gender		
Man	9	100,0

Woman	0	0,0
Smoke		
No	0	0,0
Ya	9	100,0
Final education		
SD	3	33,4
SMP	4	44,4
SMA	1	11,1
S1	1	11,

Table 3 presents the characteristics of research subjects based on age, gender, smoking history, and educational background in the control group. In the age category, most respondents were 51–60 years old, totaling 4 respondents (44.4%). Regarding gender, all respondents were male, accounting for 9 respondents (100%). In terms of smoking history, all respondents were smokers, also totaling 9 respondents (100%). As for educational background, the majority of respondents had completed junior high school education, with 4 respondents (44.4%).

2. Characteristics of Research Variables

Table 4. Characteristics of Research Variables Before Intervention at Kudungga Regional General Hospital, 2025 (n = 27)

Variabel	Mean	Median	Min	Max	SD
Acupressure Therapy Group					
Anxiety	29,67	29,00	28	32	1,225
Systolic blood pressure	149,56	148,00	132	172	13,239
Diastolic blood pressure	90,00	88,00	78	103	8,047
Pulse	89,67	90,00	78	98	5,723
Breathing	22,56	23,00	20	26	2,007
Music Therapy Group					
Anxiety	28,11	28,00	25	32	2,261
Systolic blood pressure	146,67	146,00	132	166	11,758
Diastolic blood pressure	85,11	87,00	75	93	6,547
Pulse	89,56	84,00	80	104	9,275
Breathing	22,44	22,00	20	26	1,944
Control Group (leaflet)					

Anxiety		26,33	25,00	22	32	3,000
Systolic blood pressure	blood	151,44	149,00	135	168	11,370
Diastolic blood pressure	blood	92,22	96,00	75	104	8,913
Pulse		85,00	84,00	82	90	2,739
Breathing		24,22	24,00	20	28	2,539

Table 4 presents the characteristics of the research variables—namely anxiety level, systolic blood pressure, diastolic blood pressure, pulse, and respiration rate—across the three groups before the intervention, which include the acupressure therapy group, the music therapy group, and the control group.

3. Data Normality Test Analysis

Table 5. Normality Test of Research Variables Before Intervention at Kudungga Regional General Hospital, 2025 (n = 27) Using the Shapiro-Wilk Test

Variable	p-value	Basis	Assumption	Test Used
Acupressure Therapy Group				
Anxiety	0,286	≥ 0,05	Normal	<i>Paired t test</i>
Systolic blood pressure	0,850	≥ 0,05	Normal	<i>Paired t test</i>
Diastolic blood pressure	0,658	≥ 0,05	Normal	<i>Paired t test</i>
Pulse	0,776	≥ 0,05	Normal	<i>Paired t test</i>
Breathing	0,637	≥ 0,05	Normal	<i>Paired t test</i>
Music Therapy Group				
Anxiety	0,693	≥ 0,05	Normal	<i>Paired t test</i>
Systolic blood pressure	0,462	≥ 0,05	Normal	<i>Paired t test</i>
Diastolic blood pressure	0,293	≥ 0,05	Normal	<i>Paired t test</i>
Pulse	0,060	≥ 0,05	Normal	<i>Paired t test</i>
Breathing	0,273	≥ 0,05	Normal	<i>Paired t test</i>
Control Group (Leaflet)				
Anxiety	0,194	≥ 0,05	Normal	<i>Paired t test</i>
Systolic blood pressure	0,759	≥ 0,05	Normal	<i>Paired t test</i>
Diastolic blood pressure	0,489	≥ 0,05	Normal	<i>Paired t test</i>
Pulse	0,413	≥ 0,05	Normal	<i>Paired t test</i>
Breathing	0,663	≥ 0,05	Normal	<i>Paired t test</i>

4. Bivariate Analysis Using Paired t-Test

The characteristics of the respondents are described in Tables 6, 7, and 8.

Table 6: The Effect of Acupressure Therapy on Anxiety Levels and Vital Signs in Myocardial Infarction Patients Undergoing Percutaneous Coronary Intervention (PCI) at Kudungga Regional General Hospital (n=27)

Variabel	Group	Mean	p Value
Anxiety	Before	29,67	0,000
	After	9,11	
Systolic blood pressure	Before	149,56	0,001
	After	129,11	
Diastolic blood pressure	Before	90,00	0,014
	After	82,56	
Pulse	Before	89,67	0,004
	After	82,11	
Breathing	Before	22,56	0,002
	After	19,33	

Table 6 shows the effect of acupressure therapy on anxiety levels and vital signs in myocardial infarction patients with PCI (Percutaneous Coronary Intervention) indications at Kudungga Regional General Hospital, as detailed below:

1. There is a significant effect of acupressure therapy on anxiety levels ($p = 0.000$). Acupressure therapy reduced anxiety levels, with the mean score decreasing from 29.67 to 9.11.
2. There is a significant effect of acupressure therapy on systolic blood pressure ($p = 0.001$). Acupressure therapy lowered systolic blood pressure, with the mean value decreasing from 149.56 to 129.11 mmHg.
3. There is a significant effect of acupressure therapy on diastolic blood pressure ($p = 0.014$). Acupressure therapy lowered diastolic blood pressure, with the mean value decreasing from 90.00 to 82.56 mmHg.
4. There is a significant effect of acupressure therapy on pulse rate ($p = 0.004$). Acupressure therapy reduced pulse rate, with the mean value decreasing from 89.67 to 82.11 beats per minute.
5. There is a significant effect of acupressure therapy on respiratory rate ($p = 0.002$). Acupressure therapy lowered respiratory rate, with the mean value decreasing from 22.56 to 19.33 breaths per minute.

Table 7 The Effect of Music Therapy on Anxiety Levels and Vital Signs in Myocardial Infarction Patients with PCI (Percutaneous Coronary Intervention) Indications at Kudungga Regional General Hospital (n=27)

Variabel	Group	Mean	p Value
Anxiety	Before	28,11	0,000
	After	10,44	
Systolic blood pressure	Before	146,67	0,000

	After	125,67	
Diastolic blood pressure	Before	85,11	0,023
	After	80,89	
Pulse	Before	89,56	0,029
	After	83,22	
Breathing	Before	22,44	0,023
	After	20,00	

Table 7 shows the effect of music therapy on anxiety levels and vital signs in myocardial infarction patients with PCI (Percutaneous Coronary Intervention) indications at Kudungga Regional General Hospital, as detailed below:

1. There is a significant effect of music therapy on anxiety levels ($p = 0.000$). Music therapy reduced anxiety levels, with the mean score decreasing from 28.11 to 10.44.
2. There is a significant effect of music therapy on systolic blood pressure ($p = 0.000$). Music therapy lowered systolic blood pressure, with the mean value decreasing from 146.67 to 125.67 mmHg.
3. There is a significant effect of music therapy on diastolic blood pressure ($p = 0.023$). Music therapy lowered diastolic blood pressure, with the mean value decreasing from 85.11 to 80.89 mmHg.
4. There is a significant effect of music therapy on pulse rate ($p = 0.029$). Music therapy reduced pulse rate, with the mean value decreasing from 89.56 to 83.22 beats per minute.
5. There is a significant effect of music therapy on respiratory rate ($p = 0.023$). Music therapy lowered respiratory rate, with the mean value decreasing from 22.44 to 20.00 breaths per minute.

Table 8 Changes in Anxiety Levels and Vital Signs Before and After in the Control Group of Myocardial Infarction Patients with PCI (Percutaneous Coronary Intervention) Indications at Kudungga Regional General Hospital (n=27)

Variabel	Group	Mean	p Value
Anxiety	Before	26,33	0,088
	After	25,00	
Systolic blood pressure	Before	151,44	0,107
	After	147,67	
Diastolic blood pressure	Before	92,22	0,194
	After	86,11	
Pulse	Before	85,00	0,081
	After	88,33	
Breathing	Before	24,22	0,056
	After	22,78	

Table 8 shows the changes in anxiety levels and vital signs before and after in the control group of myocardial infarction patients with PCI (Percutaneous Coronary Intervention) indications at Kudungga Regional General Hospital. It is reported that there were no significant changes in anxiety levels ($p = 0.088$), systolic blood pressure ($p = 0.107$), diastolic blood pressure ($p = 0.194$), pulse rate ($p = 0.081$), and respiratory rate ($p = 0.056$).

5. Statistical Analysis of Post Hoc Test Using Tukey’s Test

Table 9: Results of the effect of acupressure therapy and classical music therapy on anxiety levels and vital signs in myocardial infarction patients with PCI (Percutaneous Coronary Intervention) indications at Kudungga Regional General Hospital

Variabel	Group	N	Subset for alpha=0.05	
			1	2
Anxiety	Acupressure therapy	9	9,11	
	Classical music therapy	9	10,44	
	Control	9		25,00
Systolic blood pressure	Classical music therapy	9	125,67	
	Acupressure therapy	9	129,11	
	Control	9		147,67
Diastolic blood pressure	Classical music therapy	9	80,89	
	Acupressure therapy	9	82,56	
	Control	9	86,11	
Pulse	Acupressure therapy	9	82,11	
	Classical music therapy	9	83,22	
	Control	9		88,33
Breathing	Acupressure therapy	9	19,33	
	Classical music therapy	9	20,00	
	Control	9		22,78

Table 9 presents the effects of acupressure therapy and classical music therapy on anxiety levels and vital signs in myocardial infarction patients indicated for PCI (Percutaneous Coronary Intervention) at Kudungga General Hospital. The results are explained as follows:

1. The post hoc test using Tukey’s test showed that the most effective intervention for reducing anxiety levels was acupressure therapy, with the lowest mean value of 9.11.
2. The post hoc test using Tukey’s test showed that the most effective intervention for reducing systolic blood pressure was classical music therapy, with the lowest mean value of 125.11.
3. The post hoc test using Tukey’s test showed that the most effective intervention for reducing diastolic blood pressure was classical music therapy, with the lowest mean value of 80.89.

4. The post hoc test using Tukey's test showed that the most effective intervention for reducing pulse rate was acupressure therapy, with the lowest mean value of 82.11.
5. The post hoc test using Tukey's test showed that the most effective intervention for reducing respiration rate was acupressure therapy, with the lowest mean value of 19.33.

Discussion

The Effect of Acupressure Therapy on Anxiety in Myocardial Infarction Patients with PCI Indication

In the analysis of the effect of acupressure therapy on anxiety in myocardial infarction patients indicated for PCI, the study results showed that acupressure therapy significantly reduced patients' anxiety levels, with a p-value of 0.000. Before the intervention, the average anxiety level was recorded at a mean value of 29.67, which then decreased drastically to 9.11 after the implementation of acupressure therapy. This decrease indicates the effectiveness of acupressure therapy in reducing anxiety, which is crucial for patients experiencing critical conditions such as myocardial infarction.

These findings are consistent with previous studies stating that acupressure can influence the autonomic nervous system through the stimulation of specific points, thereby reducing the stress response (Y.-W. Li et al., 2022). This reduction in anxiety is particularly relevant considering that myocardial infarction patients are highly susceptible to psychological stress due to invasive procedures such as PCI (Mehta et al., 2022).

Based on respondent characteristics that may affect the outcomes, most participants were aged 31–40 years (44.4%), predominantly male (88.9%), and had a smoking habit (88.9%). Individuals in the productive age group (31–60 years) tend to experience higher stress levels due to work and family demands, making non-pharmacological interventions such as acupressure an effective solution (Tamminga et al., 2023). The predominance of male participants may be related to the higher prevalence of coronary heart disease in this group, highlighting the need for additional therapies to address often-overlooked anxiety symptoms. The high proportion of smokers indicates a cardiovascular risk factor that exacerbates anxiety, suggesting that acupressure may serve as an adjuvant therapy to help reduce nicotine dependence (Alhindal et al., 2025).

These findings strengthen the Gate Control Theory, which states that physical stimulation (such as acupressure) can inhibit the transmission of pain and anxiety signals to the brain (Melzack & Wall, 1965, in Green et al., 2025). Stimulation of the EX-HN3 (Yintang) point, located between the eyebrows, is known to activate the medial prefrontal cortex, a key area involved in emotion regulation and stress response (Yildirim & Akman, 2021). Studies have shown that applying pressure to the Yintang point increases functional connectivity between the prefrontal cortex and the amygdala, thereby reducing amygdala hyperactivity associated with anxiety (Sun et al., 2023).

Meanwhile, stimulation of the HT-7 (Shenmen) point on the wrist modulates the activity of the autonomic nervous system by enhancing parasympathetic tone, which can be measured by an increase in heart rate variability (HRV) (Son, 2019). The combination of these two points creates a synergistic effect in stabilizing the "fight-or-flight" response. Acupressure at HT-7 has also been found to increase levels of gamma-aminobutyric acid (GABA) in the anterior cingulate cortex, an inhibitory neurotransmitter that plays a major role in reducing anxiety (Journée et al., 2023). In addition, stimulation of Yintang has been reported to significantly decrease serum cortisol levels ($p < 0.01$) in post-PCI patients, indicating a direct effect on the hypothalamic-pituitary-adrenal (HPA) axis. This mechanism is further supported by findings showing that acupressure at both points enhances the production of beta-endorphins, which act as natural analgesics and mood stabilizers (Yildirim & Akman, 2021).

The results of the Tukey test, which showed the lowest mean anxiety score (9.11) after the acupressure intervention, further confirm its position as the most effective treatment compared to other modalities. This finding is consistent with the study by Khoram et al. (2020), which reported that acupressure was significantly more effective in reducing anxiety than standard relaxation therapy ($p < 0.001$) in cardiovascular patients. This superiority can be explained by the mechanism of Shenmen (HT-7) point stimulation, which has been proven to reduce sympathetic nervous system

activity (Liu et al., 2025). The confirmed effectiveness of acupressure through post hoc analysis supports a paradigm shift—from being considered a complementary therapy to becoming a first-line intervention for post-PCI anxiety, particularly among high-risk populations such as smokers (Zhang et al., 2025).

When considering the characteristics of the respondents, the majority of patients in the acupressure therapy group were aged between 31 and 40 years (44.4%), with most being male (88.9%) and smokers (88.9%). These characteristics suggest that this group may have higher levels of anxiety due to risk factors associated with smoking and age. Smoking, in particular, is known to increase anxiety and cardiovascular complications; therefore, anxiety reduction through acupressure therapy is especially relevant for this population (Zhang et al., 2025).

The study results showed a significant difference between the acupressure intervention group and the control group, with the control group showing no meaningful change in anxiety levels ($p = 0.088$). This finding is consistent with the study by Flygare et al. (2023), which reported that without active intervention, myocardial infarction patients tend to maintain high anxiety levels after PCI due to procedural stress and uncertainty about prognosis. The homogeneous characteristics of the control group (100% male, 100% smokers) may have reinforced this pattern, as this population is at higher psychological risk compared to more heterogeneous groups.

The demographic factors underlying anxiety levels in the control group include age, where the predominance of respondents aged 51–60 years (44.4%) indicates that older adults are more vulnerable to persistent anxiety without intervention due to comorbidities and reduced natural coping mechanisms (Qiu et al., 2023). The fact that 100% of the control group were male also supports previous findings that men are less likely to seek spontaneous psychological support, making structured interventions such as acupressure essential (Sagar-Ouriaghli et al., 2019). Nearly half of the respondents had a junior high school education (44.4%) and one-third had only primary education (33.4%), which may be related to limited health literacy that hinders understanding of self-management for anxiety. The unchanged anxiety levels in the control group further emphasize the importance

of active interventions such as acupressure, especially for high-risk populations (smokers, males, and those with lower education levels) (Zhang et al., 2025).

The researchers assume that this comparison highlights the importance of acupressure therapy as an effective intervention for managing anxiety in myocardial infarction patients, particularly in high-risk groups. Given these significant results, acupressure therapy can be recommended as part of a holistic approach to patient management at Kudungga General Hospital.

The Effect of Acupressure Therapy on Blood Pressure in Myocardial Infarction Patients with PCI Indication

The study results showed a significant decrease in systolic blood pressure ($p = 0.001$) from 149.56 mmHg to 129.11 mmHg and diastolic blood pressure ($p = 0.014$) from 90.00 mmHg to 82.56 mmHg after acupressure intervention.

Stimulation of the EX-HN3 (Yintang) point, located between the eyebrows, has been shown to activate the prefrontal cortex and limbic system, particularly the amygdala and hippocampus, which are involved in regulating stress responses. This mechanism reduces the release of cortisol and norepinephrine, thereby lowering peripheral vascular resistance and systolic blood pressure (Bauer, 2024). Studies have demonstrated increased functional connectivity between the prefrontal cortex and brainstem following Yintang stimulation, correlating with a 10–15 mmHg decrease in systolic blood pressure (Hung et al., 2024).

The HT-7 (Shenmen) point on the wrist is connected to the vagus nerve pathway, which modulates parasympathetic activity. Its stimulation increases heart rate variability (HRV) and decreases the sympathovagal index, promoting arteriolar relaxation (X. Li et al., 2022). Biochemical studies have found that acupressure at HT-7 increases gamma-aminobutyric acid (GABA) levels in the hypothalamus, inhibiting the sympathetic nervous system and reducing renin secretion, thereby lowering diastolic blood pressure (Zhou et al., 2024).

The combination of EX-HN3 and HT-7 stimulation enhances endothelial nitric oxide (NO) production via activation of endothelial nitric oxide synthase (eNOS), which contributes to vasodilation. Conversely, this therapy also decreases endothelin-1, a vasoconstrictor peptide, by up to 30% based on ELISA analysis. This synergistic effect explains the more significant reduction

in both systolic and diastolic blood pressure compared to single-point stimulation (Tran et al., 2022).

Based on the characteristics of respondents in the acupressure group, the profile (88.9% male, 88.9% smokers, predominantly aged 31–50 years) indicates a high-risk group for hypertension due to smoking habits and work-related stress. Acupressure is considered effective in this population because smokers tend to have high sympathetic tone, which is responsive to parasympathetic modulation through acupressure (Makhoul et al., 2020). Additionally, the synergistic effect of age is notable, as individuals aged 31–50 are at the peak of work-related stress, during which acupressure has the potential to reduce cortisol and adrenaline levels that trigger hypertension (James et al., 2023).

The control group in this study exhibited a homogeneous profile, with 100% male, 100% smokers, and a predominance of participants aged 51–60 years (44.4%). A study by Jalali et al. (2021) indicated that control groups with highly specific characteristics (e.g., only male smokers) may exhibit lower placebo effects due to already elevated cardiovascular risk factors. Furthermore, the absence of female participants limits the generalizability of the findings, as physiological responses to stress and acupressure differ by gender (Graves et al., 2021). The dominance of participants aged 51–60 years (44.4%) and the fact that 100% were smokers indicates a group with a high risk of secondary hypertension. Research by Jia et al. (2024) found that middle-aged smokers tend to have higher sympathetic tone and impaired endothelial function, which can reduce responsiveness to non-pharmacological interventions such as acupressure. This may explain why the control group did not show significant changes in blood pressure.

However, these findings contrast with Zhang et al. (2025), who reported that acupressure remains effective in smokers when combined with nicotine replacement therapy. Most respondents in the control group had a junior high school (44.4%) or elementary school (33.4%) education level, which may affect understanding of the study protocol. According to Gutierrez and Sakulbumrungsil (2021), lower education levels correlate with lower adherence in intervention studies, including inconsistencies in blood pressure measurements.

The researchers suggest that acupressure offers an effective non-pharmacological approach to reducing

blood pressure, particularly in high-risk populations, through neuromodulatory and vascular mechanisms. Nonetheless, further research is needed to optimize protocols and expand population coverage.

The Effect of Acupressure Therapy on Heart Rate in Myocardial Infarction Patients with PCI Indication

There is a significant effect of acupressure therapy on heart rate ($p = 0.004$). Acupressure therapy reduced the mean heart rate from 89.67 to 82.11.

The study results showed a significant decrease in heart rate from 89.67 to 82.11 ($p = 0.004$) after acupressure intervention, with the most pronounced effect compared to the control group. This finding is consistent with previous studies reporting a reduction of 7–12 beats per minute in post-PCI patients following stimulation of specific acupressure points. This decrease is clinically relevant because it reduces cardiac workload and the risk of arrhythmia, particularly in populations with resting heart rates above 80 bpm, which are associated with increased cardiovascular mortality (Zhao et al., 2024).

Stimulation of the HT-7 point on the wrist has been shown to activate the parasympathetic system through increased vagal nerve activity, measured by enhanced heart rate variability (HRV) and reduced sympathovagal index (Son, 2019). This mechanism involves inhibition of the cardiovascular centers in the medulla oblongata, reducing norepinephrine release from cardiac sympathetic nerves. Increased functional connectivity between the insular cortex and the nucleus tractus solitarius after HT-7 stimulation correlates with a 10–15% reduction in heart rate.

Acupressure on the EX-HN3 point at the glabella increases GABA levels in the hypothalamus through activation of GABA-A receptors, inhibiting excessive sympathetic activity (Son, 2019). Spectroscopy studies have shown a 20% reduction in glutamate levels in the amygdala after Yintang stimulation, contributing to heart rate reduction via the hypothalamic-pituitary-adrenal (HPA) axis (Kinlein et al., 2022). This point also reduces interleukin-6 (IL-6), a proinflammatory cytokine known to enhance sympathetic activity.

The combination of HT-7 (Shenmen) and EX-HN3 (Yintang) acupressure stimulation is believed to produce a synergistic effect in reducing anxiety through multiple neurophysiological mechanisms. Stimulation of these points activates endogenous opioid pathways, marked

by the release of beta-endorphins. Beta-endorphins enhance comfort, suppress sympathetic responses, and provide natural analgesic and anxiolytic effects (S. Li et al., 2022).

Additionally, the combination of HT-7 and EX-HN3 also supports baroreflex regulation. This mechanism is related to increased baroreceptor sensitivity, which helps stabilize blood pressure and heart rate. This effect is enhanced when the PC6 (Neiguan) point is included in the acupuncture protocol, given its connection to the cardiovascular system. Another important mechanism is the modulation of brain waves. Stimulation of these two points increases alpha wave activity (8–12 Hz), which is closely associated with relaxation, reduced mental tension, and decreased heart rate. Thus, the synergistic interaction between HT-7 and EX-HN3 not only suppresses sympathetic activation but also triggers more adaptive physiological responses to stress (Son, 2019).

The intervention group was dominated by males (88.9%) and smokers (88.9%) with an age range of 31–40 years (44.4%). Younger age and male predominance are associated with better responses to autonomic modulation due to higher beta-adrenergic receptor density. The limited representation of females (11.1%) restricts generalization of the findings, as females tend to have a more dominant parasympathetic tone. These findings support the integration of acupuncture as an adjuvant therapy for patients with tachycardia, particularly in the context of post-PCI care.

The intervention group was dominated by ages 31–40 years (44.4%), whereas the control group was dominated by ages 51–60 years (44.4%). This difference is significant because younger individuals tend to respond more rapidly to acupuncture therapy due to better vascular elasticity and autonomic nervous system sensitivity (Whatley, Perkins, and Samuel, 2022). Previous studies have shown that heart rate reduction after HT-7 stimulation is approximately 15% greater in individuals under 50 years compared to those over 50. This explains why the intervention group showed a more significant decrease in mean heart rate (from 89.67 to 82.11).

The control group consisted of 100% males, while the intervention group was 88.9% male. Although both groups are relatively homogeneous, research indicates that male smokers have higher sympathetic tone, making acupuncture more effective in reducing heart rate through adrenergic receptor inhibition. The control

group consisted entirely of smokers (100%) versus 88.9% in the intervention group. Nicotine increases baseline heart rate, but acupuncture has been shown to reduce this effect through modulation of cortisol and IL-6 levels.

Regarding education, the control group was dominated by junior high (SMP, 44.4%) and elementary (SD, 33.4%) graduates, while the intervention group had an even distribution across SMP, senior high (SMA), and bachelor's degree (S1) graduates (33.3% each). Higher education is associated with better therapy adherence, which influences the effectiveness of acupuncture. Studies (Robinson et al., 2024) found that patients with at least senior high education showed a 2–3 bpm greater reduction in heart rate due to better understanding of the therapy mechanism (Stahlman et al., 2023).

Post hoc analysis using the Tukey test showed that the most effective intervention for reducing heart rate was acupuncture therapy, with the lowest mean value of 82.11. These findings indicate that acupuncture exerts a significant physiological effect by reducing sympathetic nervous system activity. The decrease in heart rate can be explained by the stimulation of acupuncture points, which activates endogenous opioid pathways and triggers beta-endorphin release, resulting in relaxation and suppression of the stress response. Additionally, stimulation of specific points such as HT-7 (Shenmen), EX-HN3 (Yintang), and PC-6 (Neiguan) is known to play a role in baroreflex regulation by increasing mechanoreceptor sensitivity, thereby stabilizing cardiovascular function, including heart rate. Another supportive effect is the enhancement of alpha brain waves, which are associated with relaxation and psychological calmness. The combination of these mechanisms explains why acupuncture outperforms other modalities in lowering heart rate in post-PCI patients (Son, 2019).

These results are consistent with previous studies demonstrating that acupuncture effectively reduces vital signs, including blood pressure, heart rate, and anxiety levels, in patients with cardiovascular conditions or following invasive procedures. Therefore, acupuncture can be considered a safe, simple, and effective non-pharmacological intervention to support hemodynamic stability.

The researchers assume that the more optimal reduction in heart rate in the acupuncture group is influenced by mental relaxation and modulation of alpha brain waves,

which reduce emotional tension. The dual effect—on both the autonomic nervous system and the patient’s psychological state—suggests that acupressure is the most consistent intervention for improving post-PCI hemodynamic stability compared to other non-pharmacological modalities.

Effect of Acupressure Therapy on Respiratory Rate in Myocardial Infarction Patients with PCI Indications

The study results showed that acupressure therapy had a significant effect on reducing respiratory rate ($p = 0.002$). The mean respiratory rate decreased from 22.56 breaths per minute before the intervention to 19.33 breaths per minute after the intervention. This reduction indicates that acupressure is effective in lowering the respiratory rate toward a more stable and physiological condition. Post hoc analysis using the Tukey test confirmed that acupressure was the most effective intervention compared to other groups, with the lowest mean respiratory rate (19.33 breaths per minute).

These findings are consistent with the theory that acupressure stimulates the autonomic nervous system by suppressing sympathetic activity and enhancing parasympathetic activity. This mechanism leads to relaxation of the respiratory muscles, reduction of hyperventilation, and improved ventilation-perfusion balance. In addition, stimulation of specific acupressure points has been shown to increase the release of neurotransmitters such as serotonin and endorphins, which help reduce tension and induce a sense of calm. This explains why respiratory rate decreased significantly following acupressure therapy (Chen et al., 2022).

Compared with the control group, there was a noticeable difference in outcomes. The acupressure group was dominated by participants aged 31–40 years (44.4%), while the control group was mostly aged 51–60 years (44.4%). Age is known to influence lung capacity and thoracic wall elasticity; older individuals are more likely to experience reduced pulmonary function. Therefore, the control group, which had a higher proportion of older participants, was more prone to higher respiratory rates (Häder et al., 2023).

Smoking habits also had a significant impact on respiratory quality. In the acupressure group, 88.9% of participants were smokers, while in the control group, all participants (100%) were smokers. Smoking increases airway resistance, reduces lung elasticity, and stimulates

chronic inflammation, which can elevate respiratory rate. This difference in proportions reinforces the interpretation that the reduction in respiratory rate in the acupressure group was influenced not only by participant characteristics but was predominantly due to the effect of the acupressure therapy itself (Lin and Li, 2023).

In terms of educational level, participants in the acupressure group were relatively more diverse and balanced (Junior High School/SMP 33.3%, Senior High School/SMA 33.3%, Bachelor’s degree/S1 33.3%), whereas the control group had a higher proportion of lower education levels (Elementary School/SD 33.4% and SMP 44.4%). Education level can influence participants’ health literacy, adherence to intervention instructions, and adoption of healthy lifestyle behaviors. This factor may also contribute to the differences in outcomes between groups (Raghupathi & Raghupathi, 2020).

Previous studies support these findings, reporting that acupressure can reduce respiratory rate in patients experiencing stress or cardiovascular disorders through vagus nerve activation and modulation of brainstem respiratory centers. Zhao et al. (2024) demonstrated that stimulation of specific acupressure points significantly decreased respiratory rate in patients with high anxiety.

Clinically, acupressure can serve as a cost-effective, safe, and easily applicable non-pharmacological therapy to help regulate respiratory function, particularly in patients at risk of hyperventilation, anxiety, or cardiopulmonary dysfunction. Theoretically, these results strengthen the understanding that acupressure point stimulation exerts real neuromodulatory effects on the respiratory system, providing a foundation for developing complementary therapies in hospital settings.

The researchers assume that the effectiveness of acupressure in lowering respiratory rate is the result of a combination of the physiological mechanisms of acupressure stimulation and differences in baseline participant characteristics. These findings further confirm that acupressure is superior in providing respiratory relaxation compared to groups without intervention.

The Effect of Classical Music Therapy on Anxiety in Myocardial Infarction Patients with PCI Indications

The results of this study showed a significant effect of music therapy on anxiety levels in myocardial infarction patients with PCI indications ($p = 0.000$). Music therapy significantly reduced anxiety, with the mean score decreasing from 28.11 before the intervention to 10.44 after the intervention. This indicates that music therapy is highly effective in reducing patient anxiety. The therapy was administered in three sessions per day, each lasting 15–30 minutes. Evaluation was conducted on the third day.

Based on participant characteristics, the majority of the music therapy group were aged 41–50 years (55.6%), mostly male (88.9%), and had a history of smoking (77.8%). In terms of education, most participants had completed high school (SMA, 55.6%). Middle-aged individuals generally have good cognitive capacity to receive non-pharmacological interventions such as music therapy. Higher education also allows participants to better understand intervention instructions and actively participate, thereby increasing the effectiveness of the therapy. Although most participants were smokers—generally associated with increased anxiety due to sympathetic nervous system stimulation—this study showed that the relaxation effect of music therapy could counterbalance this risk (Wang et al., 2025).

In contrast, the control group showed no significant change in anxiety levels ($p = 0.088$). The mean anxiety score in this group remained relatively high, indicating no significant effect without intervention. Regarding participant characteristics, the control group was mostly older, aged 51–60 years (44.4%), entirely male (100%), and all had a history of smoking (100%). In terms of education, most participants had completed junior high school (SMP, 44.4%). Older age, smoking habits, and lower education levels can contribute to high anxiety levels. Older age is associated with increased vulnerability to physiological and psychological stress, while smoking increases sympathetic activity that triggers anxiety. In addition, lower education may limit patients' ability to understand medical explanations and coping strategies, so anxiety tends to remain high (Qiu et al., 2023).

Theoretically, the mechanism of classical music therapy in reducing anxiety can be explained through several aspects. Music therapy stimulates the limbic system, which is the emotional center of the brain, playing a role in stress and anxiety regulation. Slow-tempo and

harmonious music can activate the parasympathetic nervous system, reduce sympathetic activity, and suppress the release of stress hormones such as adrenaline and cortisol. In addition, music also increases the production of endorphins and dopamine, which create a sense of comfort, relaxation, and reduce psychological tension (Arnold, Bagg, and Harvey, 2024). Several previous studies have also proven that music is effective in reducing anxiety in patients with cardiovascular conditions, including patients with myocardial infarction undergoing PCI (Nadeak, Adam, and Maria, 2021; Arnold, Bagg, and Harvey, 2024).

Thus, the findings of this study reinforce that music therapy is an effective non-pharmacological intervention and is relevant for clinical application in reducing anxiety in cardiovascular patients. The significant difference between the intervention and control groups also indicates that respondent characteristics, such as age, smoking history, and education, play a role in determining the success of music therapy.

The researchers assume that the success of music therapy in reducing anxiety in myocardial infarction patients with PCI indications is influenced not only by the direct effects of music on the autonomic nervous system but also is strengthened by respondent characteristics that relatively support acceptance of the intervention.

The Effect of Classical Music Therapy on Blood Pressure in Myocardial Infarction Patients Undergoing PCI

The results of the study showed that administering music therapy over three periods (afternoon, evening, morning) with a duration of 15–30 minutes per session had a significant effect on both systolic and diastolic blood pressure. Music therapy reduced systolic blood pressure from a mean value of 146.67 to 125.67 ($p = 0.000$), and the post hoc Tukey test showed that classical music was the most effective type, with the lowest mean value of 125.11. For diastolic blood pressure, music therapy also had a significant effect ($p = 0.023$), with a reduction from a mean value of 85.11 to 80.89. The post hoc test again showed that classical music was the most effective intervention, with the lowest mean of 80.89.

When related to respondent characteristics, in the music therapy group, most respondents were aged 41–50 years (55.6%), predominantly male (88.9%), had a history of smoking (77.8%), and had a high school education (55.6%). These characteristics can influence the body's

response to music therapy, as younger age and moderate education allow patients to better understand instructions and receive psychological benefits from the therapy. Although most respondents were smokers, the effect of music therapy still showed a significant positive impact on blood pressure reduction (Qiu et al., 2023).

Conversely, no significant changes were found in the control group for either systolic ($p = 0.107$) or diastolic ($p = 0.194$) blood pressure. This may be related to the characteristics of the control group, where most were older (51–60 years = 44.4%), all were male (100%), all had a history of smoking (100%), and most had only completed junior high school (44.4%). These conditions potentially create additional risk factors, such as vascular rigidity, reduced arterial elasticity, and lower psychological coping, so without additional interventions like music therapy, blood pressure did not change significantly.

Theoretically, the mechanism of music therapy in lowering systolic and diastolic blood pressure can be explained through its influence on the autonomic nervous system. Music with a slow tempo and regular harmony, such as classical music, can stimulate increased parasympathetic activity and reduce sympathetic activity, leading to peripheral vasodilation, decreased heart rate, and lowered blood pressure. In addition, music reduces stress hormone levels such as cortisol and catecholamines, increases endorphin production, and improves heart rate variability. The combination of these physiological and psychological mechanisms makes music therapy, especially classical music, effective in lowering blood pressure in myocardial infarction patients undergoing PCI (Ghetti, 2013).

These results are consistent with previous studies. According to Darki et al. (2022), classical music can reduce blood pressure by stimulating the parasympathetic nervous system, lowering heart rate, and reducing stress hormone release. Another study by Ganesan, Manjini, and Bathala Vedagiri (2022) also showed that slow-tempo music is effective in inducing relaxation, reducing anxiety, and lowering blood pressure in post-cardiac surgery patients.

The researchers assumed that the effectiveness of classical music in lowering blood pressure and heart rate is due to its ability to modulate the autonomic nervous system, particularly by increasing parasympathetic activity (vagal tone) and reducing sympathetic

dominance. This mechanism induces relaxation, slows the heart rate, and decreases peripheral resistance, resulting in more stable blood pressure. Furthermore, classical music with a regular tempo and gentle harmony can also lower stress hormone levels (cortisol, catecholamines), which play a crucial role in blood pressure regulation.

The Effect of Classical Music Therapy on Pulse Rate in Myocardial Infarction Patients Undergoing PCI

The results of this study showed that music therapy had a significant effect on the pulse rate of myocardial infarction patients undergoing PCI ($p = 0.029$). Music therapy, administered over three periods of 15–30 minutes each (afternoon, evening, morning), was able to reduce the average pulse rate from 89.56 to 83.22. This decrease indicates a consistent relaxation effect following exposure to music, where the stable rhythm and tempo stimulate the parasympathetic nervous system, reducing sympathetic activity associated with increased heart rate.

Regarding respondent characteristics in the music therapy group, most were aged 41–50 years (55.6%). This age group is relatively productive, with cardiovascular physiological functions that are adaptable to relaxation therapy. Most respondents were male (88.9%) and had a history of smoking (77.8%). Although smoking is a risk factor that can increase heart rate and cardiac workload, the study showed that music therapy was still able to reduce pulse rate in this group. In terms of education, most respondents had completed high school (55.6%), which may influence their understanding and acceptance of non-pharmacological interventions such as music therapy.

In contrast, no significant changes in pulse rate were observed in the control group ($p = 0.081$). The average pulse remained stable without meaningful reduction before and after measurements. Respondents in the control group were mostly older, aged 51–60 years (44.4%), all male (100%), and all had a history of smoking (100%). Older age and higher prevalence of smoking are thought to affect vascular rigidity and the physiological response to stress or relaxation, so therapy without additional intervention did not produce significant changes in pulse rate. Furthermore, the majority of the control group had a junior high school education (44.4%),

which may be associated with lower understanding or acceptance of non-pharmacological stress management strategies.

Theoretically, the mechanism by which music therapy affects pulse rate is related to modulation of the autonomic nervous system. Music with a slow tempo and gentle harmonization can stimulate parasympathetic activation (vagal tone) and suppress sympathetic activity, resulting in a slower heart rate. Music also reduces stress hormones such as cortisol and catecholamines, which are associated with increased pulse during stress or anxiety. Auditory stimulation of the limbic system also produces calming emotional effects, supporting cardiovascular homeostasis.

These findings are consistent with recent studies reporting that music interventions can lower pulse rate and increase heart rate variability, indicating improved autonomic nervous system function (Liu et al., 2021; Koelsch, 2022). Therefore, music therapy can be considered a complementary intervention to help stabilize cardiovascular function in myocardial infarction patients undergoing PCI.

The researchers assumed that the reduction in pulse rate in the intervention group was influenced by a combination of music stimuli acting on the autonomic nervous system and respondent characteristics, such as relatively younger age and higher education levels compared to the control group, which made them more receptive and able to benefit from the intervention. Conversely, in the control group, older age, higher smoking prevalence, and lower education likely limited the physiological response to relaxation, resulting in no significant change.

The Effect of Classical Music Therapy on Respiratory Rate in Myocardial Infarction Patients Undergoing PCI

The results of this study showed that music therapy administered over three periods, each lasting 15–30 minutes (afternoon, evening, and morning), had a significant effect on the respiratory rate of myocardial infarction patients undergoing PCI ($p = 0.023$). The average respiratory rate of respondents decreased from 22.44 to 20.00 after the intervention. This indicates that music therapy has a relaxation effect on the respiratory system, helping to stabilize and make breathing more efficient.

Regarding the characteristics of respondents in the music therapy group, most were aged 41–50 years (55.6%). This middle-adult age group still has relatively good physiological function, including respiratory system adaptability, making them responsive to relaxation interventions. Most respondents were male (88.9%) and had a history of smoking (77.8%). Smoking typically increases airway irritability and can elevate respiratory rate; however, this study showed that music therapy was still able to reduce respiratory rate, demonstrating that the relaxing effects of music can stabilize physiological responses even in the presence of risk factors like smoking. In terms of education, most respondents had completed high school (55.6%), which may enhance their understanding and acceptance of non-pharmacological therapy, facilitating cooperation during the intervention.

In contrast, no significant changes in respiratory rate were observed in the control group ($p = 0.056$). The average respiratory rate remained stable before and after measurements. Respondents in the control group were mostly older, aged 51–60 years (44.4%), all male (100%), all had a history of smoking (100%), and most had completed only junior high school (44.4%). Older age is associated with reduced lung elasticity, lower vital capacity, and diminished adaptive responses to relaxation. High smoking prevalence further impairs pulmonary function and increases respiratory workload. Additionally, lower education levels may reduce the acceptance of relaxation interventions. These factors likely contributed to the lack of significant change in respiratory rate in the control group.

Physiologically, the mechanism by which music therapy reduces respiratory rate can be explained through the autonomic nervous system. Music with a slow tempo, stable harmonization, and soothing melody can stimulate the parasympathetic nervous system while reducing sympathetic activity. This leads to relaxation of the respiratory muscles, decreased oxygen demand, and stabilization of breathing patterns. Music therapy also affects the limbic system, which regulates emotions; feelings of calm and comfort reduce anxiety, contributing to improved respiratory regulation and lower respiratory rates.

These findings are supported by studies such as Fancourt & Finn (2021), which reported that music therapy can reduce physiological stress responses, including

respiratory rate, through parasympathetic activation and limbic emotional modulation. Chuang et al. (2022) in the *Journal of Clinical Nursing* found that slow-tempo music significantly lowered respiratory rate in cardiovascular patients, particularly those undergoing invasive procedures. A 2025 systematic review also reported that classical music therapy reduces blood pressure, pulse rate, and respiratory rate, proving effective for cardiovascular patients and intensive care settings (Jurnal Keperawatan Jomparnd, 2025).

The researchers assumed that the reduction in respiratory rate in the intervention group resulted from the interaction between the direct effects of music on the autonomic nervous system and respondent characteristics, such as younger age and higher education. These factors support a more adaptive physiological response to music relaxation. Conversely, the control group, burdened with older age, full smoking history, and lower education, was less responsive to physiological relaxation. These findings align with current evidence demonstrating the effectiveness of music therapy, especially classical music, in improving respiratory parameters through neuro-physiological mechanisms.

Conclusion

The conclusions drawn from this study are as follows:

1. Acupressure therapy is effective in reducing anxiety levels in myocardial infarction patients undergoing PCI at RSUD Kudungga.
2. Acupressure therapy is effective in reducing blood pressure (both systolic and diastolic) in myocardial infarction patients undergoing PCI at RSUD Kudungga.
3. Acupressure therapy is effective in reducing pulse rate in myocardial infarction patients undergoing PCI at RSUD Kudungga.
4. Acupressure therapy is effective in reducing respiratory rate in myocardial infarction patients undergoing PCI at RSUD Kudungga.
5. Classical music therapy is effective in reducing anxiety levels in myocardial infarction patients undergoing PCI at RSUD Kudungga.
6. Classical music therapy is effective in reducing blood pressure (both systolic and diastolic) in

myocardial infarction patients undergoing PCI at RSUD Kudungga.

7. Classical music therapy is effective in reducing pulse rate in myocardial infarction patients undergoing PCI at RSUD Kudungga.
8. Classical music therapy is effective in reducing respiratory rate in myocardial infarction patients undergoing PCI at RSUD Kudungga.
9. In the control group, reductions in anxiety levels in myocardial infarction patients undergoing PCI at RSUD Kudungga were not significant.
10. In the control group, reductions in blood pressure (systolic and diastolic) were not significant.
11. In the control group, reductions in pulse rate were not significant.
12. In the control group, reductions in respiratory rate were not significant.
13. The most effective intervention for reducing anxiety was acupressure therapy, which produced the lowest mean values in myocardial infarction patients undergoing PCI at RSUD Kudungga.
14. The most effective intervention for reducing blood pressure (systolic and diastolic) was classical music therapy, which produced the lowest mean values.
15. The most effective intervention for reducing pulse rate was acupressure therapy, which produced the lowest mean values.
16. The most effective intervention for reducing respiratory rate was acupressure therapy, which produced the lowest mean values.

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