

Effect of an education program and traditional music on anxiety in patients with myocardial infarction[☆]



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Abstract The aim of this study was to examine the effect of an education program and traditional music on anxiety in Myocardial Infarction (MI) patients. This study adopted a pretest and posttest quasi-experimental design. Sixty MI patients admitted to the ICCU of Sanglah Hospital were taken as a sample and assigned to either the experimental or control group. The intervention was given over three days during hospitalization. Anxiety was measured by a 6-item SAI and TAI, while noninvasive measurements were used in measuring physiological responses. The anxiety in the experimental group was significantly lower than that in the control group ($t = -10.34, p < .05$). However, the physiological responses were not statistically significant, except for the RR ($t = -3.80, p < .05$). This study provides empirical evidence to support the use of an education program and traditional music on anxiety among MI patients.

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Introduction

Myocardial Infarction (MI) is one of the common cardiovascular diseases that has a high mortality rate.¹ The prevalence

of anxiety in MI patients has been associated with an increased risk of re-stenosis and length of recovery, and the risk of death of MI patients with anxiety is twice as high as that of MI patients without anxiety.² Sustained anxiety in MI patients not only has a negative impact on physiological responses but also adversely affects the patient's quality of life due to increased rates of morbidity and mortality after infarction.³

Many research studies have been undertaken to identify the interventions and strategies needed to reduce anxiety in MI patients.^{4–6} However, the published studies have reported mixed results and it remains unclear which delivery and which type of intervention is most appropriate. Many stud-

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ies have developed education programs on reducing anxiety among MI patients, which have been found to effectively reduce anxiety.^{7,8} One study revealed that anxiety interfered with the ability to understand information and this meant patients were unable to remember what they had learned.⁹ Moreover, MI patients with less knowledge of their illness were also found to have higher anxiety.¹⁰

The systematic review suggested that the introduction of music in conjunction with an education program could facilitate an improvement in the patient's learning and would be helpful in reducing anxiety.¹¹ Similarly, another study argued that the implementation of an education program could be postponed until the patient's anxiety level had decreased, which can be achieved by implementing a behavior intervention plan before the patient could undertake the education program.⁹ Combined interventions have, however, received far less attention compared to single interventions to reduce anxiety. It may be noted that there is limited evidence to support the effectiveness of a combination of an education program and music in reducing anxiety.¹²

Music interventions have been studied and used in a variety of settings and populations, especially for reducing anxiety on the part of the patients.^{13,14} In addition, it has also been reported that 15–30 min of music have beneficial effects on patients' physiological responses.^{4,15} Moreover, a recent study revealed that a 5-minute music intervention was effective in anxiety reduction in women undergoing breast surgery.¹⁶ A study suggested that, with respect to the cultural aspect of music interventions could be seen as an important factor that enhances the appropriateness and effectiveness of an intervention.¹⁷ The present study was conducted to investigate the effect of an education program and traditional music on anxiety among MI patients.

Methods

A quasi-experimental design was used in this study to determine whether education program combined with traditional music reduces anxiety scores and to examine whether it has a positive effect on their physiological responses. This study was conducted in the ICCU of Sanglah Hospital. A matching technique based on age, gender, and trait of anxiety was used to balance the covariate factors in both groups.

The experimental group received the intervention, while the patients in the control group received the usual care. The patients were selected using the following inclusion criteria: (1) are aged > 18 years; (2) have stable hemodynamic levels; (3) have no hearing or cognitive impairments; (4) are not receiving anti-anxiety agents; and (5) are able to read and communicate in the Indonesian language. MI patients who had complications and had mental health problems at the time of the data collection were excluded.

Education program and traditional music

The program comprised two main sessions, namely the education program and traditional music sessions. The program was delivered for three days, starting on the second day after admission. For the education program, education was delivered through a booklet which was provided twice during the intervention. For the traditional music intervention, the

music used was Balinese traditional music that was smooth, flowing with a rhythm of 60–80 beats per minute, regular, and simple with no lyrics. These music characteristics have been used intensively in previous research studies on anxiety reduction.^{14,18,19} The traditional music had been recorded on a CD and was played using a portable CD player, and headphones were used by the patients.

On the first day of the program, patients received 20 min of traditional music in the morning and evening sessions. In the morning of the second and third days of the intervention, patients received 5 min of traditional music intervention prior to receiving 20 min of education program, while in the evening they only received 20 min of traditional music intervention.

Measurement

Anxiety was measured using Indonesian version of the 6-item State Anxiety Inventory (SAI) and Trait Anxiety Inventory (TAI),²⁰ with the reliability analysis revealing a Cronbach's alpha coefficient being .82 for the SAI and .84 for the TAI. The physiological responses including Blood pressure (BP) was measured by a sphygmomanometer, the heart rate (HR) was measured by a wristwatch for one minute, while the respiration rate (RR) was obtained by counting the number of times the chest rose and fell over one full minute. The TAI was measured once at the baseline, while SAI and physiological responses were measured repeatedly before and after each session of the program.

Data analysis

The pretest and posttest scores for SAI and physiological responses were analyzed using an independent *t* test to examine differences in the anxiety scores between the two groups.

Ethical considerations

This study was approved by the Ethics Committee of Sanglah Hospital, Bali, Indonesia. All the patients were given a written and informed consent form prior to the intervention. Participation was voluntary and refusal to participate did not affect the care received during hospitalization.

Results

During the study period, of the 65 patients who had consented to participate in this study, 60 remained in the sample. Three patients left to move to the general ward and two withdrew due to their unstable condition before completing the program. There was a total of 30 patients in the experimental group and 30 in the control group. The groups were homogenous regarding their demographic data. The majority of the patients were male (83.3%) in both groups. The age of the patients sampled ranged between 37 and 77 years with a mean age of 54.77 in the experimental group and 55.30 in the control group. Most of the patients in both groups were hospitalized for the first time with MI. Less than a quarter (13.3%) of the patients in the experimental group

Table 1 State of anxiety score and physiological responses before and after the program for the experimental group (n = 30).

Variable	Before the program		After the program		t	p
	M	SD	M	SD		
SAI	15.97	4.28	8.07	1.20	10.08	.00
Systolic BP	115.00	15.48	115.67	6.79	-.29	.77
Diastolic BP	76.33	12.73	75.27	6.69	.61	.55
HR	76.93	10.01	76.10	7.43	.40	.69
RR	17.97	3.64	15.93	2.13	2.92	.01

df = 29, t = dependent t test.

and 6.7% in the control group had received health education related to MI.

The mean scores for SAI, TAI, and physiological responses of the two groups were compared before the program. The results indicated that the two groups were not significantly different in their SAI, TAI, systolic BP, diastolic BP, HR, and RR. The SAI and physiological responses of the experimental group before and after the program were examined (Table 1), statistically significant decreases in their SAI ($t = 10.08, p < .05$), and RR ($t = 2.92, p < .05$) were shown. However, this study found that there was no statistically significant difference in systolic BP ($t = -.29, p > .05$), diastolic BP ($t = .61, p > .05$), and HR ($t = .40, p > .05$).

The mean scores for SAI and physiological responses during the three days of the program are presented in Fig. 1. The characteristics of the changes in the mean scores for SAI

and physiological responses were quite similar between the two groups. In addition, it was noted that SAI was reduced day by day during the program. The experimental group, however, showed a greater reduction in their SAI score than the control group (Fig. 1A). Only the mean scores for the RR between the two groups were found to show slightly different changes during the three days of the program (Fig. 1D).

An important result showed whether the experimental group had significantly lower SAI and physiological response scores (Table 2). The findings in both groups showed a decrease in their SAI scores after the program, but a higher reduction in SAI was found in the experimental group compared to the control group ($t = -10.34, p < .05$). In both groups, significant differences in the RR scores ($t = -3.80, p < .05$) were noted but not in the systolic BP, diastolic BP, and HR scores.

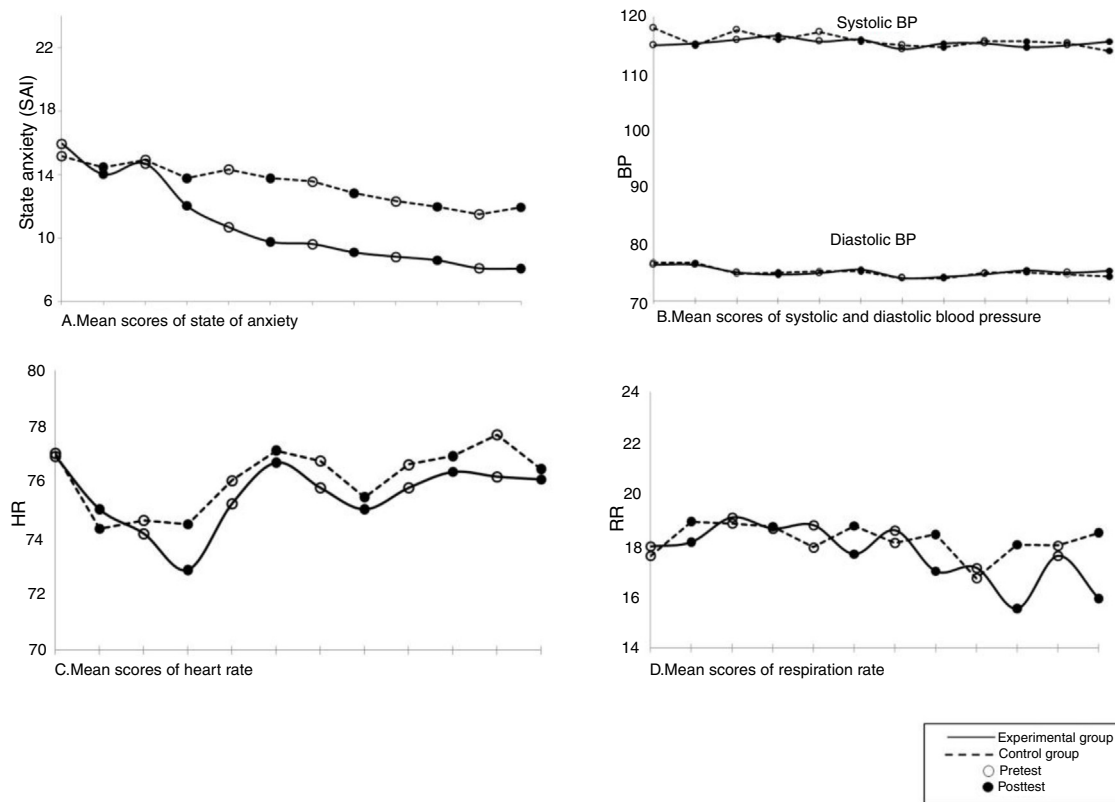


Figure 1 Mean scores of state of anxiety and physiological responses between the two groups during the three days of the program.

Table 2 State of anxiety score and physiological responses in the two groups after the program ($n=60$).

Variable	Experimental group		Control group		<i>t</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
SAI	8.07	1.20	11.93	1.66	-10.34	.00
Systolic BP	115.67	6.79	114.00	10.03	.75	.45
Diastolic BP	75.27	6.69	74.27	7.74	.57	.58
HR	76.10	7.43	76.47	7.20	-.19	.85
RR	15.93	2.13	18.50	3.03	-3.80	.00

df = 58, *t* = independent *t* test.

Discussion

The results of this study demonstrate a more significant effect on state anxiety in the experimental group compared to the control group, confirming similar findings in other populations with different types of music and content in the education programs.¹² The main finding of this current study indicates that listening to traditional music prior to an education program for MI patients can help reduce anxiety. This is possibly due to a relaxation process that improves the understanding of their disease during an education program. Another study also reported that an education program and music significantly contributed to a reduction of anxiety.²¹ This result further supports the findings of previous studies using education programs and music to reduce anxiety.

During the three days of the education program and traditional music intervention, state anxiety in both groups was found to decrease day by day during the program, despite the control group only receiving the usual care. According to the concept of Rogers' theory the Science of Unitary Human Beings and the principles of homeodynamics, this is explained by the dynamic nature of change within the human and environment energy field.²² When an MI patient has anxiety, the patient is disharmonic in terms of the person-environment energy field. The continuous balancing of the energy field through harmonious relaxation processes influences the stability of the energy field,²³ which may diminish anxiety in MI patients. Therefore, both groups have the same opportunity to reduce their anxiety.

In this present study, Reduction of state anxiety in the experimental group was achieved faster than that in the control group. This happened because the experimental group received appropriate activities to re-pattern their energy field to the maximum for decreasing their anxiety. These findings were reinforced by the positive changes in anxiety on the first day of the program by participants listening to the traditional music twice, once in the morning and once in the evening. After listening to the traditional music, the participants reported that the music assisted "quite a bit" as a motivator and as a way to diminish anxiety. Participants also reported that they felt relaxed and slept better after listening to the traditional music. The results of this study provide evidence that traditional music not only decreases anxiety, but also facilitates balance, re-establishes rhythms, and improves feelings of well-being, as earlier studies have demonstrated.^{24,25} Moreover, this finding was consistent with previous research that used Rogers' theory on music to reduce anxiety in different populations.¹³

The findings of the current study reveal no significant changes in the physiological responses, except that the RR was found to significantly decrease in the experimental group. Some drugs may have directly affected the physiological responses.²⁶ Therefore, since no significant changes were noted in the normal values of the physiological responses in this study, the medication used to treat MI possibly influenced the physiological responses and interfered with the measurements. No significant reduction in the physiological responses was also obtained in the previous study.⁴ Interestingly, in the current study, only the RR in the experimental group was found to be significantly lower after the program. According to Rogers, if the human body becomes entrained, the heart rate can slow and then continue to slow due to slower respiration and reduction in blood pressure.²⁷ Moreover, it has an intrinsic effect on body rhythms of the individual that may duplicate a healthy pulse rate in a person.²⁸

The current study was underpinned by cultural aspects such as the content of the traditional music was a socio-cultural factor that enhanced the appropriateness and effectiveness of the program in this population. The traditional music and setting of the current study was in ICCU which was in a different environmental context and care system from the other ward units. Therefore, the findings cannot be generalized to other populations and other settings. Further study is needed to assess the long-term effectiveness of this program using broader samples of MI patients.

Conclusions

Anxiety remains a frequent psychological problem among MI patients. Education program and traditional music is a simple combination for reducing anxiety; it is safe, low-risk, cost-effective, and simple to apply in clinical situations. The traditional music should be presented before the education program to allow the individual to become more comfortable and relaxed. The findings of the present study may provide evidence to support the use of education program and traditional music in the management of anxiety in MI patients.

Conflict of interest

The authors declare no conflict of interest.

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References

- Murphy SL, Xu JQ, Kochanek KD. Deaths: final data for 2010. *Natl Vital Stat Rep.* 2013;61:1–17.
- Batty GD, Russ TC, Stamatakis E, Kivimäki M. Psychological distress and risk of peripheral vascular disease, abdominal aortic aneurysm, and heart failure: pooling of sixteen cohort studies. *Atherosclerosis.* 2014;236:385–8.
- Chapa DW, Akintade B, Son H, Woltz P, Hunt D, Friedmann E, et al. Pathophysiological relationships between heart failure, depression, and anxiety. *Crit Care Nurse.* 2014;34:14–24, <http://doi.org/10.4037/ccn2014938>
- Forooghy M, Mottahedian Tabrizi E, Hajizadeh E, Pishgoo B. Effect of music therapy on patients' anxiety and hemodynamic parameters during coronary angioplasty: a randomized controlled trial. *Nurs Midwifery Stud.* 2015; 4:1–7.
- Najafi Z, Taghadosi M, Sharifi K, Farrokhian A, Tagharrobi Z. The effects of inhalation aromatherapy on anxiety in patients with myocardial infarction: a randomized clinical trial. *Iran Red Crescent Med J.* 2014;16:e15485.
- Parswani MJ, Sharma MP, Iyengar SS. Mindfulness-based stress reduction program in coronary heart disease: a randomized control trial. *Int J Yoga.* 2013;6:111–7, <http://dx.doi.org/10.4103/0973-6131.113405>.
- Aghakhani N, Sharif F, Khademvatan K, Rahbar N, Eghtedar S, Shojaei Motlagh V. The reduction in anxiety and depression by education of patients with myocardial infarction. *Int Cardiovasc Res J.* 2011;5:66–9.
- Ying Chair S, Yi Chau M, Wing Hung Sit J, Mei Ling Wong E, Wai Kiu Chan A. The psychological effects of a videotape educational intervention on cardiac catheterization patients. *Contemp Nurse.* 2012;40:225–33, <http://dx.doi.org/10.5172/conu.2012.40.2.225>.
- Fredericks S, Sidani S, Shugurensky D. The effect of anxiety on learning outcomes post-CABG. *Can J Nurs Res.* 2008;40:127–40.
- Uzun S, Vural H, Uzun M, Yokusoglu M. State and trait anxiety levels before coronary angiography. *J Clin Nurs.* 2008;17:602–7, <http://dx.doi.org/10.1111/j.1365-2702.2007.02018.x>.
- Evans D. The effectiveness of music as an intervention for hospital patients: a systematic review. *J Adv Nurs.* 2002;37:8–18, <http://dx.doi.org/10.1046/j.1365-2648.2002.02052.x>.
- Bailey L. Strategies for decreasing patient anxiety in the perioperative setting. *AORN J.* 2010;92:445–57, <http://dx.doi.org/10.1016/j.aorn.2010.04.017>.
- Covington H. Therapeutic music for patients with psychiatric disorders. *Holist Nurs Pract.* 2001;15:59–69.
- Hole J, Hirsch M, Ball E, Meads C. Music as an aid for postoperative recovery in adults: a systematic review and meta-analysis. *Lancet.* 2015;386(10004):1659–71.
- Hamel WJ. The effects of music intervention on anxiety in the patient waiting for cardiac catheterization. *Intensive Crit Care Nurs.* 2001;17:279–85.
- Palmer BJ, Lane D, Mayo D, Schluchter M, Leeming R. Effects of music therapy on anesthesia requirements and anxiety in women undergoing ambulatory breast surgery for cancer diagnosis and treatment: a randomized controlled trial. *J Clin Oncol.* 2015;33:3162–8, <http://dx.doi.org/10.1200/JCO.2014596049>.
- Good M, Picot BL, Salem SG, Chin CC, Picot SF, Lane D. Cultural differences in music chosen for pain relief. *J Holist Nurs.* 2000;18:245–60.
- Guzzetta C. Music therapy: hearing the melody of the soul. In: Dossey B, Keegan L., Guzzetta C., Kolkmeier L., editors. *Holistic nursing.* Gaithersburg: Aspen; 1995. p. 670–98.
- Nilsson U. The anxiety- and pain-reducing effects of music interventions: a systematic review. *AORN J.* 2008;87:780–807, <http://dx.doi.org/10.1016/j.aorn.2007.09.013>.
- Chlan L, Savik K, Weinert C. Development of a shortened state anxiety scale from the Spielberger State-Trait Anxiety Inventory (STAI) for patients receiving mechanical ventilatory support. *J Nurs Meas.* 2003;11:283–93, <http://dx.doi.org/10.1891/jnum.11.3.283.61269>.
- Koşucu SN, Şelimen D. Effects of education and music on anxiety, healing process and quality of life in patients undergoing coronary artery bypass grafting. *MÜSBE.* 2014;4:532.
- Rogers ME. Nursing and the space age. *Nurs Sci Quart.* 1992;5:27–34, <http://dx.doi.org/10.1177/089431849200500108>.
- Gunther M. Rogers' science of unitary human beings in nursing practice. In: Alligood MR, editor. *Nursing theory: utilization and application.* 4th ed. Mosby: Maryland Heights; 2010.
- McCaffrey R, Freeman E. Effect of music on chronic osteoarthritis pain in older people. *J Adv Nurs.* 2003;44:517–24, <http://dx.doi.org/10.1046/j.0309-2402.2003.02835.x> 48.
- Schoor JA. Music and pattern change in chronic pain. *Adv Nurs Sci.* 1993;15:27–36.
- Steg PG, James SK, Atar D, Badano LP, Lundqvist CB, Borger MA, et al. ESC Guidelines for the management of acute myocardial infarction in patients presenting with ST-segment elevation. *Eur Heart J.* 2012;33:2569–619.
- Allen K, Blascovich J. Effects of music on cardiovascular reactivity among surgeons. *JAMA.* 1994;272:882–4.
- McCaffrey R, Locsin RC. Music listening as a nursing intervention: a symphony of practice. *Holist Nurs Pract.* 2002;16:70–7.