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Phase I cardiac rehabilitation with 5-phase music after emergency percutaneous coronary intervention for acute myocardial infarction

A prospective randomized study

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Abstract

Background: Five-phase music therapy was reported to be effective in the treatment and rehabilitation of several diseases. This study explored the effect of phase I cardiac rehabilitation combined with 5-phase music in acute myocardial infarction (AMI) patients after emergency percutaneous coronary intervention.

Methods: This prospective pilot study enrolled AMI patients who received percutaneous coronary intervention from the Traditional Chinese Medicine Hospital from July 2018 to December 2019. The participants were randomized in a 1:1:1 ratio to the control, cardiac rehabilitation, and rehabilitation-music groups. The primary endpoint was the hospital anxiety and depression scale. The secondary endpoints were the myocardial infarction dimensional assessment scale, self-rating sleep status, 6-minute walk test, and left ventricular ejection fraction.

Results: The study included 150 AMI patients (n = 50/group). Hospital anxiety and depression scale showed significant time effects for both anxiety and depression (both $P < .05$), a treatment effect for depression ($P = .02$), and an interaction effect for anxiety ($P = .02$). A time effect was also observed for diet, sleep disorders, 6-minute walk test, and left ventricular ejection fraction (all $P < .001$). A difference among groups was observed for emotional reaction ($P = .001$). Interactions effects were observed for diet ($P = .01$) and sleep disorders ($P = .03$).

Conclusion: Phase I cardiac rehabilitation combined with 5-phase music could alleviate anxiety and depression and improve sleep quality.

Abbreviations: 6MWT = 6-min walk test, AMI = acute myocardial infarction, bpm = beats per minute, HADS = hospital anxiety and depression scale, LVEF = left ventricular ejection fraction, PCI = percutaneous coronary intervention.

Keywords: acute myocardial infarction, cardiac rehabilitation music, percutaneous coronary intervention

1. Introduction

About 1 and 2 million are admitted each year for acute myocardial infarction (AMI) in the United States of America and Europe, respectively.[1] Percutaneous coronary intervention (PCI) is the most effective treatment option for AMI patients.[1–4] post PCI cardiac rehabilitation is an important part of patient management and improved prognosis.[3,5] Still, nearly 60% of patients after PCI severely lack exercise.[6,7] The incidence of postoperative depression is about 27%,[8] and exercise tolerance can generally be decreased by 40% after revascularization.[9]

Cardiac rehabilitation includes 4 phases: phase 1 involves the hospitalization period, phase 2 is the immediate postdischarge

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All data generated or analyzed during this study are included in this published article [and its supplementary information files].

This prospective pilot study enrolled AMI patients undergoing emergency PCI in the Cardiology Department of Traditional Chinese Medicine Hospital of Kunshan Affiliated to Nanjing University of Chinese Medicine from July 2018 to December 2019. The present study was approved by the Medical Ethics Committee of the Traditional Chinese Medicine Hospital of Kunshan. The subjects voluntarily provided written informed consent. This trial has been registered on the Chinese Clinical Trial Register (ChiCTR) platform, with the identifier no. ChiCTR2100045559. The study was performed according to the Declaration of Helsinki and the Good Clinical Practice.

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period, phase 3 is the structured exercise program, and phase 4 is the maintenance period.[3,5] Wenger et al[10] developed the formulation for phase 1 rehabilitation, which led to shorter hospitalization and improved patient outcomes.[11,12] Still, phase 1 cardiac rehabilitation also has limitations, such as limited improvement in postoperative mental conditions.[13,14] No sense of participation and responsibility for cardiac rehabilitation limits the efficacy of cardiac rehabilitation for AMI patients after emergency PCI to a certain extent.[15,16]

Music can promote the reconstruction of the nervous system, enhance the excitability of the motor cortex, and reduce exercise fatigue. In addition, it can increase the auditory-motor connectivity and affect the kinematic reconstruction of the auditory and motor circulation pathways.[17–19] Five-phase music is based on the 5 tones (Jue, Zhi, Gong, Yu, and Shang) of traditional Chinese music. The 5 tones correspond to the 5 elements, 5 Zang organs and 5 Chi to regulate the body and mind.[20] It can effectively improve anxiety, depression, and other negative psychological emotions.[20,21] In addition, playing 5-phase music during rehabilitation treatment is also helpful in cultivating patients interest in rehabilitation treatment, improving their compliance and enthusiasm for participating in treatment, and overcoming inertia to enhance the efficacy of rehabilitation treatment.[20,21] Clinically, 5-phase music is effective in treating depression, stroke sequelae, Alzheimer disease, and hypertension.[22,23] To our knowledge, there is no data on its application combined with phase I cardiac rehabilitation among AMI patients after emergency PCI.

Participants with heart yang insufficiency have palpitations, chest tightness, shortness of breath, insomnia, and dreaminess and need to replenish qi and heart (Zhi tunes music He Hua Ying Ri can be selected). Participants with kidney yin deficiency are upset and have dizziness and tinnitus and need to supplement the kidney, consolidate essence, and soothe the nerves (Yu tunes music Bing Xue Han Tian is appropriate). Additionally, participants with an exuberance of heart fire have vexing heat of the heart and chest, flushed face and thirst, and need regulation between water and fire and harmonizing yin and yang (Zhi tunes and Yu tunes Zi Zhu Diao are correct).[24–26]

Therefore, the present study aimed to explore phase I cardiac rehabilitation combined with 5-phase music for the rehabilitation of AMI patients after emergency PCI.

2. Methods

2.1. Study design and participants

This prospective pilot study enrolled AMI patients undergoing emergency PCI in the cardiology department of the traditional Chinese Medicine Hospital from July 2018 to December 2019. The present study was approved by the Medical Ethics Committee of the Traditional Chinese Medicine Hospital. The subjects voluntarily provided written informed consent. This trial has been registered on the Chinese clinical trial register platform, with the identifier no. ChiCTR2100045559. The study was performed according to the declaration of Helsinki and the good clinical practice guidelines.

The inclusion criteria were: Confirmed as ST-segment elevation myocardial infarction according to the definition of current diagnostic criteria,[3]; Aged 18 to 70 years old; Had single-vessel disease; Undergoing emergency PCI to open the blood vessel within 6 hours of chest pain onset; Blood flow recovery of thrombolysis in myocardial infarction level 3; and; No new or recurring chest pain, no obvious signs of decompensated heart failure, no new arrhythmias or changes in electrocardiogram within 8 hours after surgery. The exclusion criteria were: Severe cardiopulmonary dysfunction; Postoperative complications such as bleeding, embolism, hemodynamic changes, arrhythmia, heart failure, etc; The presence of conditions (such as mental disorders) believed by the investigators to significantly limit the completion of hospital rehabilitation exercise and discharge follow-up, or; Severe comorbidities that could limit short-term (i.e., 6 months) life expectancy.

2.2. Randomization and blinding

A third-party statistician prepared the randomization sequence in the form of sequential envelopes that were opened in order after obtaining the informed consent. The participants were randomized into 3 groups: the control group, the cardiac rehabilitation group, and the rehabilitation-music group. The rooms were arranged according to groups, or participants were arranged in single rooms. Training on study contents was provided in advance for all investigators to ensure consistency in the study process. Randomization and questionnaire surveys were conducted by 2 graduate students who did not participate in the trial. The music operator did not participate in data collection. Due to the nature of the interventions, blinding was not possible.

2.3. Intervention team

The music cardiac rehabilitation team was responsible for the music and/or cardiac rehabilitation of the cardiac rehabilitation group and the rehabilitation-music group. The team was led by the department head (a chief physician with 32 years of working experience) and the head nurse (deputy chief nurse with 25 years of working experience). The members included 1 deputy director of Chinese medicine with 20 years of experience, 1 deputy chief physician with 17 years of experience, 1 attending physician of Chinese medicine with 13 years of experience, and 7 nurses with an average of 10.8 years of experience. All members had undergone professional training in cardiac rehabilitation and passed the assessment.

2.4. Control group

Nursing and evaluation were made according to the routine nursing of AMI after PCI. The evaluation contents included; Standard medical history; Exercise tolerance; Nutrition, sleep, psychology, and smoking cessation; Respiratory and cardiac functions. Health education was provided, including: Awareness of diseases; Significance of rehabilitation to diseases; Establishing the concept of rehabilitation; Preknowledge of the surgical scene and procedures; Breathing exercises; Rehabilitation exercises; Pain assessment; Diet guidance; Psychological adaptation guidance; and Monitoring and guidance of complications.

2.5. Cardiac rehabilitation group

If the vital signs were stable after surgery and no complication occurred, cardiac exercise rehabilitation could be implemented under the supervision of the rehabilitation team and lasted until discharge, for a total of 7 to 10 days. The rehabilitation physicians assessed the muscle strength, respiratory status (power during inhalation/inspiratory muscle strength, inspiratory volume, airflow velocity, etc), pain, sleep, psychology, and nutrition. A 1-week rehabilitation exercise prescription (Table S1, Supplemental Digital Content, http://links.lww.com/MD/I604) after emergency PCI was developed. Borg Rating of Perceived Exertion was evaluated before and after exercise.[27] The increase in heart rate by 10 to 20 beats per minute (bpm) was the standard, and the patient's self-feeling was only "a little bit tired" (Borg score < 14). The rehabilitation physicians could adjust exercise prescriptions in time according to the patient's response. If the following conditions occurred during exercise, it was discontinued immediately and resumed only after the participants were reevaluated by physicians after the conditions of the patients were stable: Heart rate ≥ 110 bpm; Angina: chest tightness, shortness of breath, palpitations, dizziness, syncope,

pale complexion, profuse sweating, etc; ST-segment depression ≥ 0.1 mV, or elevation ≥ 0.2 mV; Systolic blood pressure raised by ≥20 mm Hg (1 mm Hg = 0.133 kPa) or more, or systolic blood pressure was not elevated and decreased, or; Severe arrhythmia.

2.6. Rehabilitation-music group

The deputy director of traditional Chinese medicine conducted daily ward rounds, and music was selected from the 5-phase music cassette as the test music according to the patient's yin and yang viscera syndrome differentiation. The 5-phase music cassette (Chinese Medical Multimedia Press) was composed and arranged by Shifeng Cong based on the theory of the 5 phases of traditional Chinese medicine, and Wan Shan Hao served as the consultant of traditional Chinese medicine.

For participants with heart yang insufficiency, Zhi tunes music He Hua Ying Ri were selected. Yu tunes music Bing Xue Han Tian were selected for participants with kidney yin deficiency. A combination music of Zhi tunes and Yu tunes Zi Zhu Diao was selected for participants with an exuberance of heart fire. The volume was adjusted to 50 to 60 decibels during exercise and 40 to 50 decibels before sleep. Music was provided through portable MP3 players and earphones.

Before the rehabilitation exercise, each participant was given an MP3 player with preset music and earphones. The participant selected the corresponding tracks according to the medical orders. The volume was adjusted, and the single-cycle was set to play, starting from the warm-up and ending after the activity and relaxation training. The music playing duration was 25 to 30 minutes, and the same 5-phase music was played in a cycle before sleep for 30 minutes. The volume was adjusted to allow the patient to focus on the music, feel the rhythm and melody of the music, and soak the body and mind in the artistic conception of the music; nurses focused on the patient's feelings, observed the heart rate, blood pressure fluctuations and adverse cardiac events, took relevant measures, and recorded data.

2.7. Study endpoints

The primary endpoint was the hospital anxiety and depression scale (HADS).[28] The secondary endpoints included the myocardial infarction dimensional assessment scale,[29] self-rating sleep status,[30] 6-min walk test (6MWT),[31] and left ventricular ejection fraction (LVEF).

On day 1 after surgery and 1 month after discharge, the LVEF was evaluated, and a questionnaire survey with HADS,[28] myocardial infarction dimensional assessment scale,[29] and self-rating sleep status[30] was conducted. On day 8 after surgery, the 6MWT was used to evaluate aerobic exercise tolerance.[31]

The questionnaires were completed on day 1 after surgery and 1 month after discharge. All questionnaires were handled by graduate students who did not participate in the study. Before the questionnaires were issued, the data collectors gave the patients corresponding instructions, and the patients were required to fill in on the spot. The questionnaires were collected immediately. The data collectors checked whether the questionnaire was completely filled and the handwriting was well-defined. If an incomplete questionnaire was found, the corresponding participant was immediately asked to ensure the completeness and accuracy of the data collection. The data collectors mastered the evaluation and calculation methods of the scale and avoided inductive questions and answer in the evaluation process. The data were entered twice and checked to ensure accuracy of the data.

2.8. Adverse events

The nurses on duty and participating in the study filled out the exercise rehabilitation nursing record sheet in detail according to the actual conditions, and the adverse events during the study were recorded, including chest tightness, palpitation, ST-segment changes under electrocardiogram monitoring, blood pressure drop, heart failure, chest pain, etc, and the incidence of adverse events was calculated. The rate of safety events = the number of safety events that occurred during exercise/the number of exercises.

2.9. Follow-up

One month after surgery, the participants were followed by telephone. The follow-up contents included anxiety, depression, sleep, and quality of life questionnaires, presence or absence of chest tightness and chest pain symptoms after discharge from the hospital, taking medication on time, and follow-up needs in rehabilitation outpatient clinics. A professional rehabilitation physician with 13 years of experience who had been engaged in cardiac rehabilitation for 3 years took charge, and 2 nurses who had been engaged in cardiac rehabilitation for 2 years provided assistance.

2.10. Statistical analysis

This survey used scales to evaluate the psychological states, quality of life, and sleep after emergency PCI. According to the statistical calculation methods, the scale with the largest number of dimensions was used to calculate the sample size. Sample size = (number of dimensions × [10–15]) × (l + [10%–15%]). The scale with the most dimensions used in the present study had 7 dimensions; therefore, the sample size required for this survey was 77 to 121 participants.

The statistical package for the social sciences software (version 18.0; international business machines, Armonk) was used for data analysis. The normality and homogeneity of variance of the data were tested, and continuous data were presented as mean ± standard deviation and analyzed using Student *t* test. Repeated measures were analyzed using repeated-measures analysis of variance and were corrected by the Bonferroni method. Categorical variables were presented as n (%) and tested using the chi-square test. *P* values < .05 were considered statistically significant.

3. Results

3.1. Characteristics of the participants

The present study included 150 AMI patients who underwent emergency PCI, randomized at 50 patients/group (Fig. 1). No patients were loss or excluded after randomization and there were no significant differences in the baseline characteristics among the 3 groups (all $P > .05$) (Table 1).

3.2. Efficacy assessments

The rehabilitation-music group had a lower anxiety score (9.0 ± 2.6 vs 10.7 ± 2.6), a lower diet score (5.8 ± 1.8 vs 7.2 ± 2.4), and fewer sleep disorders (23.4 ± 5.6 vs 26.0 ± 6.3) at baseline than the controls (all $P < .05$). The primary endpoint, the HADS, showed significant time effects both for anxiety and depression (both $P < .05$), a treatment effect for depression ($P = .02$), and an interaction effect for anxiety ($P = .02$) (Table 2). A time effect was also observed for diet, sleep disorders, 6MWT, and LVEF (all $P < .001$) (Table 2). A difference among groups was observed for emotional reaction ($P = .001$). Interactions effects were observed for diet ($P = .01$) and sleep disorders ($P = .03$). Of note, the rehabilitation-music group had a lower diet score (5.8 ± 1.8 vs 7.2 ± 2.4, $P < .05$) and sleep disorder score (23.4 ± 5.6 vs 26.0 ± 6.3, $P < .05$) at baseline compared with the controls. There were time effects for physical activity, insecurity,

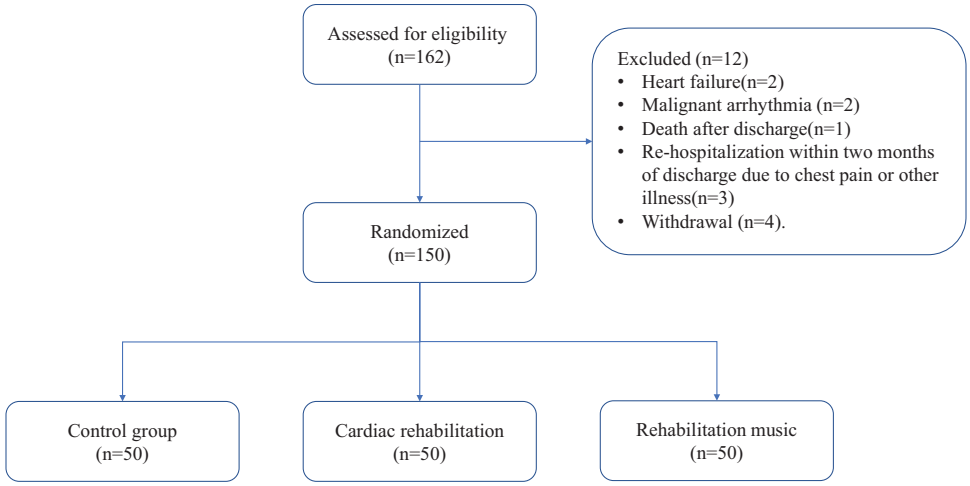

Figure 1. Patient flowchart.

Table 1

Baseline characteristics.

Characteristics	Contro (n = 50)	Cardiac rehabilitation (n = 50)	Rehabilitation-music (n = 50)	*P* value
Age, yr	49.3 ± 12.1	48.7 ± 11.8	47.4 ± 10.8	.69
Sex, male/female	44/6	43/7	40/10	.51
BMI (kg/m^2)	23.2 ± 2.8	23.0 ± 2.8	22.8 ± 2.7	.83
SBP (mm Hg)	136 ± 10	136 ± 11	139 ± 11	.33
DBP (mm Hg)	70 ± 5	70 ± 5	69 ± 4	.71
Comorbidity, n (%)				
Diabetes	9 (18.0)	11 (22.0)	16 (32.0)	.24
Hypertension	15 (30.0)	18 (36.0)	20 (40.0)	.57
Hyperlipidemia	15 (30.0)	8 (16.0)	12 (24.0)	.25
Smoking, n (%)	18 (36.0)	21 (42,0)	16 (32.0)	.58

P values < .05 were considered statistically significant.

BMI = body mass index, DBP = diastolic blood pressure, SBP = systolic blood pressure.

emotional reaction, dependency, concerns over medication, and side-effects. There were treatment effects for anxiety, physical activity, insecurity, dependency, diet, concerns over medication, side-effects, sleep disorders, 6MWT, and LVEF. There were no time-treatment interaction effects for depression, physical activity, insecurity, emotional reaction, dependency, concerns over medication, side-effects, 6MWT, and LVEF.

3.3. Adverse events

There were 10 adverse reactions, including increased heart rate, palpitation, chest tightness, and dizziness (Table 3). One case of heart failure occurred in the control group. In the cardiac rehabilitation group, there was 1 case of chest distress,1 case of heart rate > 110 bpm, 1 case of ventricular tachycardia and 1 case of high blood pressure. In the rehabilitation-music group, there was 1 case of chest distress, 2 cases of heart rate > 110 bpm, 1 case of dizziness and sweating and 1 case of ventricular tachycardia.

4. Discussion

The present study showed that 5-phase music combined with phase I cardiac rehabilitation could improve patients anxiety and depression. It is supported by Dai et al,[32] who showed that music therapy could alleviate pain, anxiety, and depression after coronary artery bypass graft. Barnason et al[33] also showed that music therapy decreased anxiety after coronary artery bypass graft. A review by Hanser showed that music decreases anxiety and depression in all patients undergoing cardiac therapy, irrespective of the procedure.[34] Still, the selection of the music might influence the outcomes. In this present study, the music was selected according to the traditional Chinese medicine types of AMI. Studies should examine whether the type of music influences the results. Still, early rehabilitation, with or without music, can help patients eliminate enhanced vagal tone and decreased norepinephrine levels after stress, lowering mean arterial pressure.[35] Cardiac rehabilitation can alleviate anxiety and depression in AMI patients.[36] Mitigating stress and anxiety is important since they are factors for nonadherence to cardiac rehabilitation.[15,37] The results showed that anxiety scores increased in all 3 groups after the intervention, which is a known process of the patients when facing the difficulties of healing and uncertainty regarding the future.[38] On the other hand, the scores of depression were lower in the rehabilitation-music group than in the rehabilitation group, suggesting that music therapy could help the patients cope with their situation, as suggested by previous studies.[22,32]

In the present study, based on the recommendations in the expert consensus on exercise rehabilitation after PCI and exercise rehabilitation prescriptions,[11] a 1-week rehabilitation exercise prescription after emergency PCI was developed, but in the actual implementation process, it might need to be more individualized regarding the contents of cardiac rehabilitation. Appropriately increasing the level of exercise and adding appropriate resistance exercise is a problem to be addressed. For the discontinuous use of cardiac rehabilitation regimens for patients with a moderate and high risk of myocardial infarction, the literature suggests that it is beneficial, but individualized

Table 2

Study efficacy assessments.

Endpoints	Time points	Control (n = 50)	Cardiac rehabilitation (n = 50)	Rehabilitation-music (n = 50)	Time effect		Intervention effect		Interaction effect	
					F	*P* value	*F*	*P* value	*F*	*P* value
Primary end-points										
HADS										
Anxiety score	Before intervention	10.7 ± 2.6[c]	10.1 ± 2.4	9.0 ± 2.6[c]	44.23	< .001	1.12	.33	4.04	.02
	After intervention	11.6 ± 2.7	12.1 ± 3.5	12.1 ± 2.9						
Depression score	Before intervention	10.0 ± 2.9	9.7 ± 2.5	8.6 ± 2.4	25.06	< .001	3.92	.02	1.47	.23
	After intervention	10.7 ± 2.2	11.4 ± 2.4	10.6 ± 2.7						
Secondary endpoints										
MIDAS										
Physical activity	Before intervention	28.6 ± 5.9	28.9 ± 5.6	27.6 ± 5.4	0.99	.32	0.96	.38	0.44	.63
	After intervention	29.9 ± 6.8	28.7 ± 5.8	28.4 ± 6.0						
Insecurity	Before intervention	18.3 ± 4.8	17.6 ± 4.4	18.4 ± 5.7	2.89	.09	0.45	.64	0.14	.87
	After intervention	19.6 ± 5.5	18.9 ± 5.0	19.0 ± 6.1						
Emotional reaction	Before intervention	8.0 ± 2.9	8.1 ± 2.6	6.2 ± 2.2	0.38	.54	7.7	.001	1.64	.2
	After intervention	7.7 ± 3.3	8.0 ± 2.4	7.1 ± 2.2						
Dependency	Before intervention	7.1 ± 1.7	6.9 ± 1.6	6.9 ± 1.8	0.02	.88	0.46	.63	0.24	.79
	After intervention	7.1 ± 2.0	6.8 ± 2.3	7.1 ± 1.6						
Diet	Before intervention	7.2 ± 2.4[c]	6.8 ± 2.0	5.8 ± 1.8[c]	34.48	< .001	2.62	.08	4.45	.01
	After intervention	7.9 ± 1.3	7.8 ± 2.0	8.1 ± 1.9						
Concerns over medication	Before intervention	4.7 ± 1.5	4.9 ± 1.8	4.9 ± 1.6	2.28	.13	0.01	.99	0.68	.51
	After intervention	4.7 ± 1.6	4.5 ± 1.7	4.5 ± 1.9						
Side-effects	Before intervention	0.8 ± 0.4	0.8 ± 0.5	0.9 ± 0.6	0	1	0.06	.55	1.96	.16
	After intervention	0.9 ± 0.4	0.8 ± 0.6	0.8 ± 0.5						
SRSS										
Sleep disorders	Before intervention	26.0 ± 6.3c	24.1 ± 4.1	23.4 ± 5.6[c]	14.48	< .001	1.27	.28		
									3.57	.03
	After intervention	26.1 ± 6.3	27.9 ± 4.9	26.6 ± 4.8						
6MWT	Before intervention	431.5 ± 43.1	448.7 ± 32.0	445.3 ± 38.7	25.56	< .001	1.36	.26	1.92	.15
	After intervention	419.3 ± 41.6	415.4 ± 44.7	423.7 ± 34.3						
LVEF	Before intervention	60.6 ± 5.2	61.2 ± 4.8	62.1 ± 4.9	20.64	< .001	1.14	.32	0.31	.74
	After intervention	58.6 ± 4.5	59.1 ± 5.2	58.2 ± 5.7						

P values < .05 were considered statistically significant, *P* < .05 between the control and cardiac rehabilitation groups, *P* < .05 between the cardiac rehabilitation and rehabilitation-music groups, *P* < .05 between the control and rehabilitation-music groups.

6MWT = 6-minute walk test, HADS = hospital anxiety and depression scale, LVEF = left ventricular ejection fraction, MIDAS = myocardial infarction dimensional assessment scale, SRSS = self-rating scale of sleep.

Table 3

Adverse events.

Adverse events, n (%)	Control (n = 50)	Cardiac rehabilitation (n = 50)	Rehabilitation-music (n = 50)
Chest distress	0	1	1
Heart rate > 110 beats/min	0	1	2
Dizziness sweating	0	0	1
Heart failure	1*	0	0
Ventricular tachycardia	0	1	1
High blood pressure	0	1	0

* Occured after defecating in bed.

implementation requires further research. In addition, during the study, it was shown that patients awareness of cardiac rehabilitation is lacking, so education and publicity should be enhanced so that patients can continue to undergo continuous rehabilitation from phase 2 to phase 3 after discharge from the hospital.

Besides anxiety and depression, which were the primary outcomes, music combined with cardiac rehabilitation improved diet and sleep disorders, suggesting a better quality of life. Cardiac rehabilitation itself improves the quality of life,[39,40] but adding music therapy seems further to improve the quality of life.[34,41] Still, the most optimal regimens for quality of life remain to be determined.

Rechcinski et al[35] studied the effect of cardiac rehabilitation in 190 patients with ACS after coronary angioplasty, and the results showed that physical training after revascularization in ACS patients was safe and tolerable, and after the course of rehabilitation, exercise tolerance was significantly increased. In developed countries, exercise rehabilitation and secondary prevention are booming, and many national and international clinical guidelines have recommended that patients participate in exercise rehabilitation after PCI.[11] In the present study, 10 adverse events were observed, but they did not endanger the patients and were manageable. Of course, cardiac rehabilitation, especially phase 1, must be supervised by physicians and healthcare professionals, who can promptly intervene if anything occurs.

This study has limitations. It was a pilot study performed at a single hospital with a small sample size, limiting the generalizability of the results. Still, it provides a proof-of-concept for the use of music therapy in cardiac rehabilitation. Of course, blinding was not possible, probably introducing some bias.

5. Conclusion

Phase I cardiac rehabilitation combined with 5-phase music could alleviate anxiety and depression and improve the sleep of AMI patients after PCI. Altogether, these results provide insights into potential ways to enhance the mental status and quality of life of patients after PCI.

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Writing – review & editing: Xu Yao, Yi Jin, Chunlan Gao, Yuqin Zhang, Yun Lu, Xiaoting Li, Lili Ma.

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