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Address: Mashhad Nursing and Midwifery School, Ebn-e-Sina St., Mashhad, Iran
P.O.Box: 9137913199
Tel.: (098 51) 38591511-294
Fax: (098 51) 38539775
Email: EBCJ@mums.ac.ir

Short Report

Impact of Relaxation Training and Exercise on Quality of Life in Post-myocardial Infarction Patients: A Randomized Clinical Trial

Mehdi Mahmoodi[1], Gholam Reza Mahmoodi-Shan[2*], Mohammad Zaman Kamkar[3], Naser Behnampour[4], Mozhdeh Dabirian[5]

Abstract

Myocardial infarction (MI) decreases patients' quality of life (QOL). The present study aimed to investigate the effect of relaxation training and exercise on QOL in post-MI patients. This single-blind, randomized, clinical trial was conducted on 64 post-MI patients at Fatemeh Zahra Hospital in Sari, Iran, in 2013. The study population was divided into two groups of intervention and control. The intervention group received training and was followed-up for 8 weeks at home. The data were collected using MacNew QOL Questionnaire. Data analysis was performed in SPSS (version 16) using t-test. There were significant differences between the intervention and control groups regarding the mean scores of the three QOL domains. Total QOL showed a significant difference after relaxation program (P≤0.001). Relaxation exercises resulted in the improvement of QOL in post-MI patients. Therefore, nurses are recommended to train these exercises to patients to practice at home.

Keywords: Education, Myocardial infarction, Quality of life, Relaxation

1. MSc, Mazandaran University of Medical Sciences, Sari, Iran
2. Assistant Professor, Nursing Research Center, Faculty of Nursing and Midwifery, Golestan University of Medical Sciences, Gorgan, Iran
3. Assistant Professor, Department of Psychology, Golestan University of Medical Sciences, Gorgan, Iran
4. Assistant Professor, Department of Biostatistics, Health Management and Social Development Research, Golestan University of Medical Sciences, Gorgan, Iran
5. Assistant Professor, Department of Cardiology, Fatemeh Al Zahra Education Hospital, Mazandaran University of Medical Sciences, Mazandaran, Iran

* Corresponding author, Email: mahmoodigh@yahoo.com

Introduction

Myocardial infarction (MI) is responsible for many deaths around the world and adversely affects patients' quality of life and survival (1). There has been an increasing interest in improving the quality of life in patients with chronic diseases in recent decades (2). One study showed that MI causes various health problems affecting the quality of life (3). Quality of life can be an indicator of the success of the treatment program received by patients. Knowledge about the patients' quality of life can help nurses deliver more effective nursing care (2). Evaluation of the quality of life in MI patients offers valuable information about these patients' health status and their responses to the treatments (4).

Quality of life involves physical, psychological, and social well-being and is a reflection of the patients' feelings about a range of self-recognized issues and concerns (5). The MI is one of the most stressful life events for many individuals. Based on the evidence, stress is directly associated with quality of life in patients (6). Stress has a significant and persistent impact on the patients' quality of life (7). After an episode of MI, patients experience multiple forms of stress. About 70-80% of these patients experience anxiety during the acute phase of their condition (8). An essential goal of nursing care for MI patients is to decrease stress and anxiety through stress management techniques.

Antoni et al. (2006) emphasized the importance of relaxation training after MI (9). There is some evidence indicating that rehabilitation programs have improved the quality of life in post-MI patients. Relaxation training and exercise offer a type of rehabilitation that may improve the quality of life in post-MI patients (10). This form of rehabilitation is focused on attention, mental representation, imagery, posture, and relaxation of the mind and muscles; moreover, it contributes to automatic balance and stress management in patients (11).

Nurses should seek ways to reduce the stress and anxiety experienced by these patients, and consequently help them improve their quality of life. There is contradictory evidence regarding the effectiveness of relaxation on the quality of life (12, 13). Ahmadinejad et al. (2015) implemented stress management and relaxation training for a group of pregnant women and reported a decreased in depression and anxiety in the intervention group, compared to that in the control group (14).

Furthermore, in a study, relaxation was concluded to be effective in reducing the psychological symptoms in premenstrual syndrome (15). Few studies have followed up patients after exposure to relaxation training at the hospital. With this background in mind, the present study was conducted to determine the effect of relaxation training and exercise on the quality of life among post-MI patients.

Methods

This single-blind, randomized, parallel-design, clinical trial was conducted on post-acute MI patients admitted to the Coronary Care Unit (CCU) and Post-CCU of Fatemeh Zahra Hospital in Sari, Iran, from August 2013 to March 2014. The study population was selected using simple random sampling technique, and then randomly assigned into two groups of control and intervention. The sample size was determined as 27 patients in each group (before: 181.72±28.68, after: 203.7±28.42) based on the results of a similar study (16), considering an alpha of 0.05 and test power of 80% and using the test for the difference of two means.

The sample size was increased to 32 patients per group (total=64) to account for potential dropouts. For the purpose of sampling, one of the researchers assessed 131 MI patients admitted to the CCU of the hospital using convenience sampling. Subsequently, 64 subjects who met the eligibility criteria were randomly assigned into the intervention and control groups.

The inclusion criteria were: 1) experience of an episode of MI for the first time (i.e., no previous history of MI), 2) no history of psychological disorders or use of medications affecting mental health, 3) no history of severe and life-threatening diseases, 4) lack of communication difficulties, 5) no education in psychology or medicine, 6) reading and writing literacy, 7) no history of attending workshops about relaxation, 8) no previous heart surgeries, and 9) age of above 30 years. On the other hand, the only exclusion criterion was the history of a heart surgery.

The data were collected using a demographic checklist and the MacNew Quality of Life after Myocardial Infarction (QLMI) questionnaire. The demographic checklist inquired about the subjects' age, gender, occupation, and income. The MacNew QLMI questionnaire was originally developed for

patients with acute MI who subsequently referred for cardiac rehabilitation. This instrument consists of 27 items in 3 domains, including physical limitations (13 items), emotional function (14 items), and social function (13 items), which are scored based on a seven-point Likert scale (17). Some items are present in more than one domain.

The MacNew QLMI questionnaire has demonstrated acceptable psychometric properties. Ribera et al. suggested a significant correlation among the three domains of this questionnaire (18). The reliability of this research instrument has been confirmed, rendering the Cronbach's alpha coefficients of 0.85, 0.93, and 0.82 for the physical, emotional, and social domains, respectively (18).

The data were collected prior to the intervention, and then just before the patients' discharge in both intervention and control groups. The patients filled out the MacNew QLMI questionnaire before discharge, and then 2 months later (at their own home or in the clinic). Both control and intervention groups received routine education from the nursing staff; however, the intervention group was additionally provided with training on relaxation exercises.

In the intervention group, the patients received training on relaxation exercises at the post-CCU for 3 days, and then at their own home. One of the researchers briefed the subjects, who were all blind to their group allocation on the research objectives. An expert (i.e., a psychologist) taught the relaxation techniques to the subjects, and they practiced them in the education room. Each training session lasted about 30-45 min.

The intervention (i.e., relaxation training) was composed of progressive muscle relaxation and guided imagery. The relaxation process started with tensing the toe muscles and consciously letting them relax, followed by the tensing and relaxation of the foot, ankle, calf, thigh, lower body, upper body, finger, hand, wrist, lower arm, upper arm, neck, jaw, scalp, and eyelid muscles.

When the training was over, the researchers evaluated the patients' knowledge and ability to perform relaxation exercises at home. All contents of the education program were delivered to the subjects in the intervention group in the form of video CDs and booklets before being discharged from the hospital. The researchers then followed up the subjects every week through meetings and phone calls.

The control group did not receive any relaxation training from the nurses before discharge. The quality of life was assessed in both intervention and control groups in the first week of hospital stay and at the end of the eight-week relaxation exercise at home. The subjects were briefed on the research objectives before entering the study and were ensured of the confidentiality of their data. Furthermore, written informed consent was obtained from all the participants. This research was approved by the Clinical Ethics Committee of Golestan University of Medical Sciences in Iran and registered at the Iranian Registry of Clinical Trials with the code of IRCT2013072710325N3.

The data were analyzed in SPSS software (version 16). The normality of the quantitative variables was confirmed using the one-sample Kolmogorov Smirnov test. The paired and independent t-tests were also used to investigate the effectiveness of the subjects' relaxation performance. P-values less than 0.05 was considered statistically significant.

Results

The majority of the subjects were male (84.4%) and married (93.8%). In terms of the education level, 46.9% of the participants had high school diploma. Furthermore, 46.9% and 42.2% of the subjects were self-employed and smokers, respectively. The mean age of the participants was 52.29±8.19 years (age range: 37-77 years).

The results of Chi-square test indicated no significant difference between the intervention and control groups in terms of demographic characteristics (P>0.05) (Table 1). Furthermore, the results of the self-report checklists showed that all subjects in the intervention group performed the progressive muscle relaxation exercises regularly at home. The independent t-test revealed no significant difference between the two groups regarding quality of life before the intervention. In addition, quality of life showed no significant correlation with age, marriage, education level, and history of smoking.

According to the results of the paired t-test, the intervention group showed a significant difference in the mean scores of physical limitations (P≤0.001), emotional function (P≤0.001), social function (P=0.003), and overall quality of life (P≤0.001) after the intervention, compared to those prior to the intervention. In this regard, the mean scores of all these variables showed a significant increase in this

group after the relaxation program. Additionally, the control group showed a significant difference in the mean scores of the aforementioned variables two months post-intervention, compared to that before the intervention (Table 2). However, the mean scores of these variables in this group demonstrated a significant decrease.

There were also significant differences between the intervention and control groups in terms of the mean scores of physical limitations (P≤0.001), emotional function (P≤0.001), social function (P≤0.001), and overall quality of life (P≤0.001) (Table 2). The quality of life increased in the intervention group in all aspects; however, in the control group, it decreased after two months, compared to the baseline (Table 2).

Table 1. Demographic characteristics of the intervention and control groups with acute coronary heart disease

Variable		Groups		P-value Chi-square
		Intervention n (%)	Control n (%)	
Age (years)	Below 40	3 (9.4)	2 (6.3)	P=0.94
	41-50	11 (34.4)	12 (37.5)	
	51-60	13 (40.6)	14 (43.8)	
	Above 61	5 (15.6)	4 (12.5)	
Gender	Male	27 (83.7)	23 (71.9)	P=0.22
	Female	5 (15,5)	9 (28.1)	
Marital status	Single	1 (3.1)	1 (3.1)	P=0.35
	Married	31 (96.9)	29 (90.6)	
	Divorce	0 (0)	2 (6.3)	
Education	Under diploma	10 (31.3)	14 (43.8)	P=0.30
	Diploma and upper	22 (68.7)	18 (56.2)	
Employment	Employed	7 (21.9)	8 (25)	P=0.24
	Housewife	12 (37.5)	18 (56.3)	
	Retired	12 (37.5)	5 (15.6)	
	Unemployed	1 (3.1)	1 (3.1)	
Smoking	Smoking	14 (43.8)	13 (40.6)	P=0.064
	No smoking	18 (56.3)	19 (59.4)	
Opium consumption	Yes	2 (6.3)	4 (12.5)	P=0.73
	no	30 (93.8)	28 (87.5)	

Table 2. Mean scores of quality of life in patients with acute coronary heart disease in the two groups

Quality of life	Group	Intervention (Mean±SD)	Control (Mean±SD)	P-value* Between group
Emotional	Before	61.1±13.0	65.9±11.6	P=0.12
	After	74.7±6.2	60.1±8.7	P≤0.001
	P-value** Within group	P≤ 0.001	P=0.005	
Physical	Before	66.0±14.9	69.0±12.6	P=0.38
	After	82.0±7.7	63.9±8.8	P≤0.001
	P-value** Within group	P≤0.001	P=0.032	
Social	Before	62.8±13.7	65.0±12.0	0.48
	After	71.9±5.8	58.1±7.5	P≤0.001
	P-value** Within group	P=0.003	P=0.002	
Total quality of life	Before	190.0±38.7	200.0±34.3	P=0.27
	After	228.0±18.9	182.2±24.2	P≤0.001
	P-value** Within group	P≤0.001	P=0.004	

*Independent t-test
**Paired t-test

Implications for Practice

Provision of training on relaxation techniques and nursing support for performing these exercises at home are crucial steps in nursing care. These programs can be executed by community health nurses or educated nurses. The MI patients need supportive programs, such as relaxation training, to improve both their psychological and physical functioning. Physicians can therefore prescribe relaxation techniques to MI patients based on their conditions.

Acknowledgments

Conflicts of Interest

The authors declare that there are no conflicts of interests.

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