

# Anxiety Treatment by Eye Movement Desensitization and Reprocessing in Patients With Myocardial Infarction

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Received 2015 January 26; Accepted 2015 February 07.

## Abstract

**Background:** Anxiety after myocardial infarction is a very common problem leading to an increase in complications and hospitalization length.

**Objectives:** This study was conducted to evaluate a 12-month follow-up of the effect of eye movement desensitization and reprocessing (EMDR) on anxiety levels in myocardial patients.

**Materials and Methods:** This study was a clinical trial study. Sixty myocardial patients were selected using convenience random sampling and divided into two experimental and control groups. The experimental group (n = 30) received EMDR in two 45 - 90 sessions. No treatment was given to the control group (n = 30). The instrument for collecting data in this study was the Beck anxiety inventory which was completed in both groups in three steps: before and after intervention, and at the end of a 12-month follow-up period.

**Results:** The findings collected during the 12-month follow-up indicated that EMDR was effective for treating anxiety in myocardial patients.

**Conclusions:** EMDR is an effective tool for curing or decreasing the level of anxiety in myocardial patients.

**Keywords:** Eye Movement Desensitization and Reprocessing, Anxiety, Myocardial Infarction, Nursing Care

## 1. Background

Myocardial diseases are among the most fatal agents in developed countries. Although the fatality rate has been dramatically reduced over the last four decades, it is still responsible for deaths in one-third of people over the age of 35 (1). Anxiety after myocardial infarction is a very common phenomenon and leads to an increase in complications and length of hospitalization. Anxiety is the most prevalent psychological response to myocardial infarction. The anxiety rate in American patients with intense myocardial infarction is almost 70% - 80% (2). Some studies show that patients believe that the main cause for their anxiety is fear of death and reinfarction (3). Patients who are anxious in the first 48 hours after myocardial infarction are 4.9 times more susceptible to reinfarction, recurrent ischemia, ventricular fibrillation, and sustained ventricular tachycardia than other patients (2). Due to the negative effects of anxiety on myocardial patients, physicians and nurses are required to accurately examine their patients and then employ more effective control and treatment (3).

The therapeutic approaches applied for anxiety treatment in myocardial patients include behavioral-cognitive methods such as eye movement desensitization and reprocessing (EMDR) (4). Through this approach the therapist asks the patient to move his or her eyes based on a systematic pattern while recalling his unpleasant memories. In this way, the stimulation level drops and the thoughts are reorganized (5). This treatment technique has been successfully applied to treat people suffering from shock, anxiety, fear, unpleasant memories, post-traumatic stress disorder (PTSD), and other emotional problems (6). EMDR is more effective than psychotropic treatment for PTSD (7). Due to the presence of natural anxiety in intensive care unit (ICU) patients, ICU nurses are required to understand the importance of anxiety in the overall conditions of the patients and apply a systematic and comprehensive system to investigate and treat anxiety in these patients (8).

## 2. Objectives

The present study was conducted to analyze the effects of EMDR on anxiety levels in myocardial patients.

## 3. Materials and Methods

This is a clinical study conducted before and after the intervention and 12 months after the program in two groups, experimental and control. The participants in this study were 60 myocardial patients hospitalized in the ICU of Bu-Ali Sina hospital of Qazvin. Sampling was carried out in a purposeful manner where the patients were randomly assigned to either the experimental or control groups, each with 30 participants. Myocardial infarction diagnosis by a specialized physician, passing the intense period of the disease, stability of the hemodynamic condition of the patient, literacy, within the age group of 30 - 70 years, intensive infarction, history of spasms, psychological diseases, addiction, strabismus, and visionary problems were the criteria to enter the study, while an inability to tolerate the EMDR procedure and not cooperating with the therapist were the excluding factors.

The authors started the data-gathering process after gaining permission from the ethics committee of Qazvin University of Medical Sciences with registration No. 28.20.6190 and registering it at the Iran clinical trial center with registration No. IRCT2012090610752N1, receiving a written informed consent form from all participants, and receiving official permission from the related authorities. There was no obligation for the samples to participate in this study and they were ensured confidentiality of their all information. For data collection, two instruments were used: a demographic specification questionnaire and the Beck Anxiety Inventory (BAI). The background characteristics were age, gender, marital status, education level, infarction type, smoking experience, and profession. To measure the participant's anxiety level, the BAI was applied. The reliability and validity of the BAI was determined by Kaviani and Mousavi (1999) when studying the psychological properties of this test on the Iranian population with a reliability coefficient of 0.72, a one-month test-retest validity coefficient of 0.83, and a  $\alpha$ -Cronbach of 0.92. The BAI is designed as a Likert scale and contains 21 questions mainly emphasizing physiological aspects of anxiety. Three questions are allocated to anxiety mood; three questions are for distinct fears; and the other questions measure automatic hyperactivity symptoms and anxiety movement stress. The scoring system of the responses was: "not at all" (0), "mildly" (1), "moderately" (2), and "severely" (3). The BAI has a maximum score of 63 where: 0 - 21, 22 - 35, and > 36 indi-

cate the minimal, moderate, and severe levels of anxiety, respectively.

The participants in the control group filled out the demographic and BAI questionnaires in the first session. The participants in the experimental group also filled out the demographic questionnaire before any intervention. Next, the author introduced himself to each patient, explaining the study objectives and giving the required explanations about EMDR. This step was performed to familiarize the patient with the EMDR procedure, its positive and useful effects as a non-chemical treatment for anxiety disorder, depression, post-traumatic stress disorder, etc., and to observe the active participation of the patients to cooperate with the researchers for performing the EMDR procedure. Two 45 - 90 minutes EMDR sessions were provided to the patients, with a single day between the sessions. The treatment was performed in the consulting room of the myocardial unit at Bu-Ali Sina University of Medical Sciences. The BAI questionnaire was filled out before and after each intervention. 12 months after dismissal from the hospital, BAI questionnaires were again filled out by the patients, in order to investigate the long-term effects of the treatment in the experimental group.

### 3.1. Eye Movement Desensitization and Reprocessing Treatment

The EMDR treatment included all eight phases composing the EMDR therapy provided in a shorter session time (45 - 90 minutes). During the reprocessing phases, the patient was instructed to identify an image that represents the worst part of the cardiac event, a negative irrational self-belief associated with the image, a positive adaptive cognition, emotions, and attendant body sensations. Next, while initially focusing on the image, negative belief, and sensations, the client was guided according to standardized procedures to simultaneously move his or her eyes back and forth following the therapist's fingers as they moved across his or her field of vision for a "set" of approximately 24 - 36 seconds. After the set, the client reported any new associations that may have emerged. Such associations generally became the focus of the next set of dual attention or were guided by the clinician. This process continued until the target memory was desensitized (as measured from 0 to 10 on the subjective units of disturbance (SUD) scale). Following this, further eye movement sets were used while the patient was thinking of an identified adaptive belief. This was repeated until the new statement felt true to the patient and all physical disturbances were dissipated. Over the sessions, this treatment process was used to address memories of the cardiac event and associated present triggers, as well as anticipatory anxiety related to potential future incidents. The patient was asked

to briefly document any disturbance between sessions. No treatment techniques were prescribed as homework (9).

The data gathered during sessions one and two in the experimental and control group were analyzed using the SPSS16 software, through the descriptive and inferential statistic tests. Comparisons between the groups and over time were conducted with a repeated measures linear mixed model analysis using the intent-to-treat paradigm, and the K-square test (for investigating demographic characteristics of the samples). A P value of less than .05 was considered significant.

#### 4. Results

Tables 1 and 2 illustrate the results of the analysis. As shown in Table 1, the two groups showed no significant statistical difference in terms of demographic properties such as gender, education level, marital status, infarction type, and occupation when applying the K-square statistical test. The one exception was smoking, in regards to which the two groups showed a statistically significant difference ( $P < 0.001$ ). The mean age of the participants was  $50.97 \pm 8.25$  and all of them were in the age range of 35-70.

As shown in Table 2, the mean anxiety score of the infarction patients in the control group during session one was  $49.10 \pm 5.13$  which reached  $48.40 \pm 5.31$  two days later without any intervention, which is significant when applying the paired t-test ( $P < 0.000$ ). The mean anxiety score in the experimental group was  $48.87 \pm 4.28$  before the intervention and  $7.37 \pm 2.42$  after the intervention which also indicates a statistically significant difference ( $P < 0.000$ ).

#### 5. Discussion

The results of this study indicated that the demographic characteristics in the experimental and control groups had no significant statistical difference, except for smoking. In regards to the EMDR treatment, the mean anxiety of the myocardial patients decreased to 7.36 from 48.86 after intervention; furthermore, it had decreased to 6.73 12 months after the program, which is statistically significant. This also implies that the adjusted natural anxiety level of the patients is reflected in the test results gathered immediately after intervention. This finding is consistent with those reported by Arabia et al. (9).

An unexpected finding of this study is that the mean anxiety score of the control group with no intervention received indicated a significant drop. Another noteworthy point is that despite a significant decrease in anxiety in the control group, these patients still indicated a high level of anxiety that was not tolerable for them. The potential

causes for this decrease of anxiety in the control patients can be attributed to the use of tranquilizers and other delivered drugs and patients' beliefs.

Arabia et al. (2011) conducted a study on the treatment of post-traumatic stress disorder (PTSD) and anxiety and depression symptoms in survivors of life-threatening cardiac events (9). Their findings indicated a mean anxiety score of 48.67 before intervention in these patients. After employing the EMDR procedure, the mean anxiety score decreased to 33.10. Moreover, the mean anxiety score of these patients was reduced to 32.45 after the 6-month follow-up.

Abbasnejad et al. (2007) conducted a study on the efficiency of EMDR in reducing unpleasant feelings resulting from the Bam earthquake and found that the mean anxiety score in the experimental group before and after the intervention was 33.8 and 16.19, respectively, and 13.57 at the 6-month follow-up (10). In contrast, the score in the control group before the intervention was 33.6 and it decreased to 31.8 after the intervention.

In a study conducted by Hogberg et al. (2008), it was found that EMDR leads to a considerable drop in post-traumatic stress disorder symptoms (where the outcome was stable in the 8- and 35-month follow-ups (11). This is consistent with the findings of the present study.

According to the study conducted by Macklin et al. (2000), the effects of EMDR in the treatment of post-traumatic disorder are still obvious even in a 5-year follow-up, confirming the findings of this study (12).

The findings of the present study revealed that in using the t-test there is a statistically significant difference between the experimental and control groups in terms of the mean anxiety score, which implies a considerable reduction of the anxiety level in the patients treated with EMDR compared to the control group.

In a study conducted by Khosropour et al. (2012), it was reported that the effect of cognitive debriefing and EMDR was stronger than imaginal exposure in the treatment of the mentioned disorders and the treatment results were stable in the 3-month follow-up (5).

Therefore, owing to the fact that EMDR treatment effects are stable in the long-term follow-up, it is recommended that EMDR be employed for the control and treatment of anxiety in other patients. Furthermore, we recommend educating ICU nurses in the use of this method for treating anxiety in myocardial patients, as it is a standard, novel, and economically-justified technique.

#### Acknowledgments

It is our pleasure to offer our most sincere thanks to the authorities of the nursing and midwifery department of

**Table 1.** Demographic Characteristics of the Patients<sup>a</sup>

Parameters	Groups		Test Results
	Experiment	Control	
<b>Gender</b>			0.635
Male	25 (83.3)	25 (83.3)	
Female	5 (16.7)	5 (16.7)	
<b>Marital status</b>			0.5
Single	2 (6.7)	3 (10)	
Married	28 (93.8)	27 (90)	
<b>Education level</b>			0.931
Primary school	15 (50)	15 (50)	
Secondary school	9 (30)	10 (33.3)	
College	6 (20)	5 (16.7)	
<b>Smoking</b>			0.001
Yes	20 (66.7)	7 (23.3)	
No	10 (33.3)	23 (76.7)	
<b>Infarction type</b>			0.113
Anterior	14 (46.7)	14 (46.7)	
Inferior	7 (23.3)	8 (26.7)	
Posterior	6 (20)	4 (13.3)	
Other	3 (10)	4 (13.3)	
<b>Profession</b>			0.415
Clerk	23 (76.7)	19 (63.3)	
Retired	5 (16.7)	6 (20)	
Housewife	2 (6.7)	5 (16.7)	

<sup>a</sup>Values are expressed as No. (%).**Table 2.** Mean and SD of Pretest, Post-Test, and 12-Month Follow-Up for Experimental and Control Groups' BAI<sup>a</sup>

Measures/Condition	BAI	P Value
<b>Experimental</b>		< 0.001
Pretest	48.86 ± 4.28	
Post-test	7.36 ± 2.42	
Follow-up	6.73 ± 2.09	
<b>Control</b>		< 0.001
Pretest	49.10 ± 5.13	
Post-test	48.40 ± 5.31	
Follow-up	42.36 ± 6.15	

<sup>a</sup>Values are expressed as mean ± SD.

Qazvin University, the nursing staff in the myocardial male and female unit of Bu-Ali Sina hospital of Qazvin, and the

patients who participated in this study. Without their assistance and contribution, this research could not have been

completed.

## Footnote

**Authors' Contribution:** Study concept and design was completed by Mohammad Moradi and Reza Zeighami. Acquisition of data was done by Mohammad Behnam Moghadam and Mohammad Moradi. Statistical analysis was completed by Mahmood Alipor and Mohammad Behnam Moghadam. Analysis and interpretation of data was done by Mahmood Alipor, Mohammad Behnam Moghadam, and Reza Zeighami. Mohammad Behnam Moghadam and Reza Zeighami wrote the manuscript draft. Critical revision of the manuscript for important intellectual content was done by Reza Zeighami. Administrative, technical, and material support was given by Mohammad Moradi, Zeighami, and Hamid Reza Javadi. Mohammad Moradi, Reza Zeighami, and Hamid Reza Javadi supervised the study.

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