Original Article

The Effect of Optimism Training on Emotional Problems and Life Satisfaction in Patients with Myocardial Infarction

Shamsaddin Aghatabay[1], Mozhgan Sepahmansour[2*], Mohammad Hatami[3], Amin Rafieipour[4]

[1-] *PhD Candidate, Department of Psychology, Central Tehran Branch, Islamic Azad University, Tehran, Iran*
[2-] *Associate Professor, Department of Psychology, Central Tehran Branch, Islamic Azad University, Tehran, Iran*
[3-] *Associate Professor, Department of Psychology, Kharazmi University, Tehran, Iran*
[4-] *Assistant Professor, Department of Psychology, Payame Noor University, Tehran, Iran*
[(*] *Corresponding Author: Mozhgan Sepahmansour, Email: drsepahmansour@yahoo.com)*

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Abstract

Introduction: Acute myocardial infarction (MI) is one of the leading causes of death in the developed world. The purpose of the present research was to examine the effect of optimism training on reducing emotional problems and increasing satisfaction with life (SWL) in patients with MI.

Methods: This research was a quasi-experimental with the plan of the pre-test, posttest and control group. The statistical population included all patients with MI 40-65 years old referred to Kasra hospital in Karaj in 2019. The sample was 90 patients with MI assigned to the two experimental and control groups randomly. Data collected using the Depression Anxiety Stress Scales-21 (DASS-21) and the satisfaction with life scale (SWLS). The data analyzed using the methods of univariate and multivariate analysis of covariance.

Results: The result showed that optimism training significantly decreases emotional problems and increases life satisfaction in the experimental group ($p<0.01$).

Discussion: Optimism plays an important role in coping with stressful and adverse events and optimistic patients adapt better to stressful situations compared to pessimists, with positive repercussions on their quality of life. This finding has important implications as regards the education and mental health of patients with MI.

Declaration of Interest: None

Key words : Optimism training, Emotional problems, Life satisfaction, Myocardial infarction.

Introduction

Cardiovascular disease (CVD) is a major contributor to the growing public health epidemic in chronic diseases or non-communicable diseases (1, 2). Every 25 seconds in the United States, one person were diagnosed with CVD, and about 34 percent of patients die that year, equivalent to one death per minute (3). Myocardial infarction (MI) is one of the leading causes of death in developed societies. Its prevalence is around 3 million people worldwide (2, 3) and is the first cause of death in Iran (4). An MI occurs when an atherosclerotic plaque slowly builds up in a coronary artery and then suddenly ruptures (5). There are many risk factors associated with CVD and MI. CVD's risk factors include decrease in physical activity, weight gain, smoking, occupational and psychological stress and noncompliance with health recommendations (6, 7).

Numerous studies indicate that psychological risk factors increase the risk of CVD and affect the impact of recovery following CVD events (8). For example, research results have shown that anxiety and depression are common in patients with CVD and can significantly reduce heart health (8, 9). Santos (10) in his research showed that

patients with CVD report serious psychological problems such as high levels of anxiety, depression, and self-criticism that can affect their health negatively. Emotional problems are one of the psychological factors associated with CVD because emotional distress stimulates the sympathetic activity producing fluctuations in the cardiovascular system – tachycardia, hypertension, and relocation of the blood flow (3, 9). Several studies have demonstrated that anxiety and depression are the most common psychological symptoms in patients with MI (7, 9). Results of a study indicate that between 19 and 66 percent of patients with MI have some mental disorder, primarily depressive and anxiety states, which in turn accelerates their mortality (4, 7).

On the other hand, personal choice in coping strategies is determined by one's attitude towards life and his overall assessment of life events (11, 12), which is referred to as Satisfaction with life (SWL). Satisfaction with life as a whole refers to subjective well-being and constitutes a cognitive, overall judgment (12, 13). This judgment results from comparing one's own circumstances with what considered an appropriate standard. SWL is a central component of overall well-being systematically associated with positive and negative affect, subjective vitality, and physical and mental health (14). SWL is affected by various factors. One study examined life satisfaction in patients with coronary heart disease after coronary angiography (15). The results show that women tend to declare lower levels of satisfaction than men do. Patients who were married were more satisfied (15). Also, the SWL of patients with cardiovascular risk factors (i.e obesity, diabetes, and physical inactivity) was lower; and patients with depressive and anxiety symptoms reported poor SWL (15).

According to research results that emphasize the influence of psychological factors on the emergence and persistence of heart disease, psychological interventions are needed to reduce emotional problems and increase the life satisfaction of these patients. Among positive psychological constructs, optimism can be a key goal. Optimism has been associated with beneficial cardiovascular health and possibly superior immune functioning (16). Positive psychological factors have also linked to adaptive hypothalamic-pituitary-adrenal axis functioning and reduced inflammation (8, 17). Optimism reflects the expectation that good things will happen (8). Optimists, in the face of adversity, pursue their valued goals and regulate themselves and their personal states using effective coping strategies (16). Huffman et al. (18) in their research aimed at evaluating positive psychological interventions such as optimism in patients with CVD showed that positive psychological constructs like optimism associated with better health behaviors and superior cardiac prognosis. They also showed that positive interventions could increase positive emotions and cognitions. Therefore, positive psychological interventions can increase health behavior in patients with CVD. In another study that aimed to investigate the effectiveness of optimism training on life satisfaction in cardiovascular patients, the results showed that this intervention increased life satisfaction and hope and reduced anxiety in patients (17). Celano et al (8) examined the impact of optimism as a positive psychological intervention on promoting health behaviors after acute coronary syndrome. The results of their study showed that deficits in positive psychological constructs (e.g., optimism) are linked to reduced participation in health behaviors, supporting the potential utility of positive psychology-based intervention in these patients. The researchers aimed to identify desirable components of the positive psychology-based intervention to promote physical activity in this group of patients, indicating that positive psychology-based

interventions are associated with significant improvements in behavioral and psychological outcomes. Considering all the mentioned and the psychological problems observed in these patients and in order to determine the effect of positive-based interventions in Iran, the present study aimed to investigate the effectiveness of optimism training in reducing emotional problems and increasing life satisfaction in patients with MI.

Method

This research was a quasi-experimental study with a pretest-posttest design and control group. In this study, intervention status was considered as an independent variable in two levels (optimism training and non-intervention training), and emotional problems and life satisfaction as dependent variables. The statistial population of this study included all patients with MI aged 40-65 years who have been under treatment in Kasra hospital of Karaj in 2019. The sample consisted of 90 patients with MI who were selected by convenience sampling method, were randomly assigned into two experimental, and control groups. As the population was specific and limited, the sample size was obtained by the following formula with an accuracy of 5% and a confidence level of 95%.

$$n = \frac{2\left(1 - \frac{\alpha}{2} + 1 - \beta\right)\text{\^{}}2}{\Delta^2} + 1$$

Inclusion criteria included: willingness to participate in the study; male and female patients with MI aged 40-65 years and diagnosed by a specialist physician; patients with the education level of at least a middle school degree. Exclusion criteria included: unwillingness to continue to participate in the study; a history of known mental illness or mental disability; receiving concurrent psychiatric and psychological intervention; chronic physical illness; and addiction or substance abuse.

Data collection was done by using the following tools:

Depression Anxiety Stress Scales-21 (DASS-21): DASS-21 is a self-report measure of the severity of three related negative emotional states (19). The DASS-21 has been widely recognized for its reliability and different forms of validity in a range of studies from different countries with different samples. Items in the DASS-21 scored based on a Likert scale through individual structured interviews with the participants to assess the negative states of depression, anxiety, and stress. Each subscale in the DASS-21 has seven items, and each item comprises of a statement replied with four options reflecting the severity of the mentioned mental disorders. The DASS-21 has shown to have the same factor structure as the original 42-item version (20). To complete the DASS-21, respondents are asked to circle a number 0, 1, 2, or 3 indicating how much the item applied to them over the past week, where 0 equals "Did not apply to me at all," 1 equals "applied to me to some degree, or some of the time," 2 equals "applied to me to a considerable degree or a good part of the time," and 3 equals "applied to me very much, or most of the time. The validity and reliability of the DASS-21 have been confirmed for the Iranian population. For instance, in a study, which was performed on 970 students and armies, the authors have stated that the translated version of the scale is comparable to the original version, with the internal consistency estimated at 0.77, 0.79, and 0.78 for depression, anxiety, and stress, respectively (21).

The satisfaction with life scale (SWLS): SWLS includes the five items that were were answered using a 7-point Likert scale, where 1 = strongly disagree and 7 = strongly agree (11). Items rated on a 7-point Likert scale ranging from "Strongly Disagree" to "Strongly Agree (e.g., "I am satisfied with my life"). In Iran, this scale has been used in cardiac patients and its reliability and validity have been confirmed. Amri et al. (22) reported Cronbach's alpha coefficient and test-retest reliability of 0.83 and 0.79, respectively. Also, according to the researchers, the validity

coefficient of this scale with the Beck Depression Inventory and the Oxford Happiness Scale was significant.

Optimism Training: Group optimism training is a protocol based on the theory of happiness of Seligman (23), and Segerstrom (24). Subjects completed 3-5 90-minute sessions per week for 12 sessions.

Table1: Structure and content of optimism training sessions

Session	Content
1	Initial familiarity, a brief overview of the history of positive psychology, and emphasizing that this branch of psychology focuses on strengths and weaknesses rather than focuses on strengths and weaknesses; pre-test, and outlining general training sessions.
2	Increasing positive emotions in the present (doing things that make life happier), discussing the absence of positive emotions that lead to psychological injuries.
3	Increasing positive emotions in the past so that one can be satisfied with their past behavior when looking at their past.
4	Increasing positive emotions in the future - hoping for the future and expecting positive results in the future (optimism).
5	Examine the attribution style of optimists; optimists regard bad events as temporary and related to the particular and external cause and therefore do not blame themselves.
6	Fighting irrelevant thoughts and beliefs; examining Ellis's theory of explanation, that is, the problem or disorder that occurs to the individual depends on the individual's view of the event.
7	Finding ways to overcome irrational thoughts in patients by discussing and applying four methods of reviewing evidence, alternatives, implications, usefulness, and then a sense of energy and vitality experienced by successful debate.
8	Pleasant life; to enhance well-being by focusing on positive emotions and doing activities that enhance positive emotions, such as eating a favorite meal or meeting a best friend. This exercise is especially useful for people who are extremely involved in work activities.
9	Engaged life; to increase well-being by focusing on identifying strengths and how to use them in the workplace, social relationships with others, and leisure time. This domain includes activities that involve people so severely that they do not understand the passage of time.
10	Meaningful life; to enhance the well-being and activities that the family, community, and the world benefit from. These include the gift of time or positive services, devoting time to charity and humanitarian services to achieve something higher than one's self and link to higher ideals, attending mosques, shrines, churches, temples, sacred places, and working with institutions charity to increase meaning in life.
11	Full life; through joyful life (emphasis on positive emotions), productive life (activities that boost and improve life), and meaningful life.
12	Summary, post-test implementation, acknowledgments

After obtaining permission from the university, the necessary arrangements were made to cooperate with the hospital. The sample group was selected by convenience sampling method and randomly assigned to experimental and control groups. The subjects were made aware of the research goals and asked to participate in the treatment program. Optimism training sessions consisted of 12 90-minute sessions that were performed in a group setting, once a week, in the hospital. Before and after the intervention, the two groups completed the questionnaires. Data analyzed in SPSS 19 Software.

Results

The mean age of the experimental and control groups was 54.34 ± 9.17 and 53.04 ± 8.97, respectively. In the experimental group and control, 88.8% (40 people) and 77.8% (35 people) were married and 15.6% (7 people) were single. In the control group, 95.8% (43 people) were married, respectively. Table 2 provides a description of the variables of the study includes depression, anxiety, stress and satisfaction with life in control and experimental groups based on the pretest and posttest results.

Table2: Mean and standard deviation of variables in control and experiment groups

variables		Experimental group		Control group	
		Mean	**SD**	**Mean**	SD
Depression	**Pretest**	**11.59**	**3.22**	**13.04**	3.09
	Posttest	**8.95**	**3.56**	**12.55**	2.99
Anxiety	**Pretest**	**15.00**	**1.93**	**13.13**	1.97
	Posttest	**11.58**	**3.19**	**11.89**	2.15
Stress	**Pretest**	**13.46**	**1.67**	**12.98**	2.57
	Posttest	**10.22**	**1.99**	**12.44**	2.82
Satisfaction with life	**Pretest**	**16.53**	**2.41**	**17.40**	1.66
	Posttest	21.20	1.85	17.31	1.61

As seen in the table, there is an obvious difference between the mean posttest scores of depression, anxiety, stress, and satisfaction with life in the control and experimental groups. In the experimental group, the mean scores of depression, anxiety, and stress in posttest are lower than the scores of the pretest. The mean scores of Satisfaction with life in the posttest are higher than the scores of the pretest.

Multivariate analysis of covariance was used to examine the differences between groups in depression, anxiety and stress scores. Box and Levene's tests were used before using the parametric test of analysis of covariance. Here, the significance value of the Box test was not less than 0.05, therefore and the presumption of homogeneity of variance/covariance matrixes has been well met (Box=14.24, F=1.62, P>0.05). According to the results of Levene's test, the presumption of equality of intergroup variances has been observed for the posttest and its insignificant results for all variables (p>0.05). Therefore, the assumptions are met and multivariate analysis of covariance can be done. The results of Wilks Lambda showed that there is a significant difference between the posttest of the studied groups in terms of at least one of the dependent variables (Wilks Lambda= 0.218, F=99.37, P < 0.001). According to the results of eta-squared, it was found that the difference between the two groups is significant regarding the dependent variables and this difference in posttest is 78% based on Wilks Lambda (eta squared=0.51); i.e. 51% of the variance is related to the difference between the two groups which results from the mutual effect of dependent variable of depression, anxiety, and stress.

Table3. The results of the analysis of covariance

Variable	Source of change	SS	Df	MS	F	Eta squared
Depression	Pretest	5.63	1	5.63	0.56***	**0.007**
	Group	243.18	1	243.18	24.36***	**0.223**
	Error	847.55	85	9.97		
Anxiety	Pretest	211.19	1	211.19	43.86***	**0.34**
	Group	78.25	1	78.25	16.25***	**0.16**
	Error	409.3	85	4.81		
Stress	Pretest	261.35	1	261.35	93.47***	**0.52**
	Group	103.37	1	243.18	36.97***	**0.30**
	Error	**237.66**	**85**	**9.97**		

*P<0.05 **P<0.01 ***P<0.001

As presented in table 3, with the controlled effect of the pretest, there is a significant difference between the posttest results of experimental and control groups in terms of the mean scores of depression (F=24.36), anxiety (F=78.25), and stress (F=36.97) (p <

0.001). In other words, in the posttest of the experimental group, optimism training group has reduced depression, anxiety, and stress significantly in patients with MI.

Univariate analysis of covariance was used to examine the differences between groups in satisfaction with life scores. Levene's test was used before using the parametric test of analysis of covariance. The significance value of the test was more than 0.05, and therefore the presumption of equality of intergroup variances has been observed for posttest and its insignificant results for the variable of satisfaction with life ($p>0.05$). Therefore, the assumption is met and univariate analysis of covariance can be done.

Table4. The results of the analysis of covariance

Variable	Source of change	SS	Df	MS	F	Eta squared
Satisfaction with life	Pretest	75.60	1	75.60	34.76***	**0.28**
	Group	393.98	1	393.98	181.12***	**0.67**
	Error	**189.24**	**87**	**2.17**		
	*P<0.05	**P<0.01		***P<0.001		

As presented in table 4, with the controlled effect of the pretest, there is a significant difference between the posttest results of experimental and control groups in terms of the mean scores of satisfaction with life ($F=181.12$) ($p < 0.001$). In other words, in the posttest of the experimental group, optimism training has significantly increased satisfaction with life in patients with MI.

Discussion and Conclusion

The aim of this study was to determine the effect of optimism training on reducing emotional problems and increasing SWL in patients with MI. According to the findings of the study, optimism training had an effect on reducing the emotional problems in patients with SWL and significantly reduced anxiety, depression, and stress in these patients, which is consistent with the results of (8, 17, 18). Boehm et al. (25) in their study that aimed to determine the effectiveness of happiness training on psychological variables in patients with heart disease, showed that positive mental states in these patients are associated with improvement of cardiovascular function, so interventions based on happiness can lead to promising results in promoting positive psychological states and reducing depression in heart patients. In explaining this finding, it can state that optimism training can improve the function of the immune system by affecting emotional problems (24). Optimists cope differently with stressors, experience less negative mood, and may have more adaptive health behaviors, all of which could lead to better immune status.

Optimism plays an important role in coping with stressful and adverse events (23). One explanation for this relationship is that optimists cope with adverse events more effectively than pessimists (24). It has demonstrated that in the presence of severe pathological conditions, optimistic patients adapt better to stressful situations compared to pessimists, with positive repercussions on their quality of life (16). Optimists tend to use coping strategies that focalize on the problem more frequently compared to pessimists (16, 23). When these strategies cannot be enacted, optimists resort to adaptive strategies that focalize on the emotions. For example, acceptance, humor and positive re-assessment

of the situation (17, 26). Optimism training could promote well-being through the facilitation of goal adjustment. Optimists are more inclined than pessimists to pursue goals tenaciously, although they also engage in flexible goal adjustment (27). Moreover, they are more likely to reengage in new goals when their current goals are not attainable. Thus, it appears that optimism is uniquely related to positive affect. This means that optimists are generally happier with their lives than pessimists. In general, people who are optimistic about conflicts are able to think deeply and reasonably, to express their emotions and thoughts appropriately and to motivate themselves by maintaining control (17, 26). The positive thinking that usually comes with optimism is a key part of effective stress management (23). People with high optimism are less likely to experience anxiety, depression, and stress, and to have better adaptive responses to life's adverse events.

According to the research findings, optimism training has an impact on increasing the life satisfaction of myocardial infarction patients. Thus, optimism training significantly increased life satisfaction in patients with myocardial infarction. Consistent with the results of the study, Mohammadi et al. (17) in their study aimed to evaluate the effectiveness of optimism training in patients with coronary artery disease showed that this intervention is associated with improvement of life satisfaction, hope and anxiety factors in patients. Celano et al. (8) in their study aimed to investigate the effect of optimism training as a positive psychological intervention on promoting health behaviors after acute coronary syndrome, suggesting that deficits in positive psychological constructs (eg, optimism) by reducing participation in behaviors health-related. The researchers aimed to identify desirable components of the positive psychology-based intervention to promote physical activity in this group of patients, indicating that positive psychology-based interventions are associated with significant improvements in behavioral and psychological outcomes. In explaining this finding, it can be said that the ability to regulate different emotions, such as anger, hopelessness, and depression, are components of optimism that indicate the serious impact of optimism on mental health (27).

In fact, optimism training for patients with MI leads to growth and control, delaying or eliminating impulses or stresses that impede the goals (17). Optimists rarely abandon their effort to attain their goals. Optimistic subjects tend to have a more frequently protective attitude, are more resilient to stress and are inclined to use more appropriate coping strategies (27, 28). Optimists are able to maintain a balance between positive and negative emotions and use both mental states to maintain mental stability and reduce stress under appropriate conditions (29, 30), which has an important role in life satisfaction. When experiencing anger or disgust, they can easily shift to a positive state. Instead of expressing anger, they try to keep their calm and are able to calm down their anger. This ability to control and modify stressful conditions keeps them away from the harmful effects of anxiety, stress, and depression resulting from it, which in turn can increase life satisfaction (30, 31). Kim et al. (32) in a study on the effect of positive thinking on mental health and SWL, concluded that optimism increases life satisfaction by increasing mental health. They also showed that optimism has a direct effect on life satisfaction; in other words, optimism can improve one's life satisfaction by affecting one's feelings and emotions and developing a positive attitude. Learning how to turn our thoughts into optimism after each failure gives us a permanent skill to overcome depression and hopelessness. It also promotes mental health and well-being by increasing the ability to solve problems in despair.

One of the limitations of this study is that this study was limited to 40-65 years old patients with myocardial infarction at Kasra hospital in Karaj and therefore it is difficult to generalize its results. Another limitation of this study was

the absence of a follow-up test to determine the long-term effects of optimism training in the long run. The mere use of the questionnaire for data collection is another limitation of the present study. The results of this study have important implications for the education and promotion of mental health in patients with MI, and optimism training can be combined with other interventions to increase therapeutic response.

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