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RESEARCH ARTICLE

COMPARISON OF THE EFFECTIVENESS OF EMOTION REGULATION METHOD BASED ON GROSS MODEL AND BENSON MUSCLE RELAXATIONTECHNIQUE ON RESILIENCE AND ANGER IN PATIENTS WITH CORONARY ARTERY DISEASE

Rahmat Ramazani[1], Fatemeh Mohammadi Shir Mahleh[*2], Tahreh Ranjbaripour[2], Vahid Ahamdi[3], Javid Peymani[2]

[1]PhD student, Department of Psychology, Karaj Branch, Islamic Azad University, Karaj, Iran
[2]PhD, Department of Psychology, Karaj Branch, Islamic Azad University, Karaj, Iran
[3]PhD, Department of Psychology, Ilam Branch, Islamic Azad University, Ilam, Iran

Corresponding Author: Fatemeh Mohammadi Shir Mahleh, PhD, Department of Psychology, Karaj Branch, Islamic Azad University, Karaj, Iran, **Email:** m_mohammadi1352@yahoo.com

ABSTRACT

Background: Coronary heart disease which imposes a heavy burden on the health care system worldwide. Psychological factors are effective in the occurrence and persistence of this disease. The aim of this study was to compare the effectiveness of emotion regulation method based on Gross model and muscle relaxation technique on resilience and anger in patients with coronary heart disease.

Methods: The research method is quasi-experimental and pre-test-post-test and follow-up with the control group. The statistical population includes all patients with coronary heart disease (CHD) between 30 and 50 years old referred to medical centers and private clinics of cardiologists in Ilam in 2021, of which 60 people were available by random sampling and random distribution to three groups. Were divided. The data collection tool is the use of standard resilience and anger scales.

Results: The results of repeated measures analysis of variance showed the effectiveness of Gross model-based emotional regulation training in patient resilience, so that Benson muscle relaxation exercises compared to Gross model-based emotional regulation training increased patients' resilience and effect. It was better. Also, Benson muscle relaxation exercises were effective in reducing patients' anger. However, the results showed the ineffectiveness of Gross model-based emotion regulation training on anger.

Conclusions: By using Gross model emotion regulation training and Benson muscle relaxation exercises, we can take steps to provide services to patients with or with a history of heart disease and reduce the severity of the disease.

KEYWORDS: Gross model-based emotional regulation, muscle relaxation technique, resilience, anger, coronary heart disease.

Key messages

Emotion regulation training and muscle relaxation exercises, we can take steps to provide services to patients with or with a history of heart disease and reduce the severity of the disease.

INTRODUCTION

Coronary heart disease (CHD) imposes psychological, social and financial burdens on society, there is a great interest in finding ways to reduce its occurrence; therefore, a lot of research has been done to identify and reduce risk factors. Some risk factors have been linked to

specific mechanisms. The most important risk factors for coronary heart disease are demographic, biological, and behavioral, including old age, male gender, family history of cardiovascular disease, smoking, high cholesterol, high blood pressure, lack of Exercise, overweight, diabetes are sweet. Also, psychological factors may affect cardiovascular health through specific mechanisms. Factors may increase cardiovascular health by directly affecting the biological system or indirectly (for example, facilitating health-promoting behaviors). Psychological factors are also associated with increased optimism, positive thinking, vitality, hope and purpose in life and life satisfaction with cardiovascular health. Resilience is one of the most important and effective variables on a person's resistance to some diseases. Resilience is a personality trait that as a psychological factor is associated with the spread of chronic diseases and is defined in health related sciences as an ability to deal with life problems and will act as a shield against the negative events of daily life. A study by Kalisch et al.[1] shows that significant trauma and adverse psychological conditions obviously cause significant changes in both short-term and long-term outcomes and predispose individuals to chronic diseases such as cardiovascular problems. Anger, as one of the variables that people deal with on a daily basis, also affects ordinary people, especially cardiovascular patients. Anger is a fundamental emotion that is explained as a state of negative emotion associated with cognitive evaluation, psychological change, and a desire for action. Videbeck (2006) believes anger as a natural emotion and considers it as severe anxiety and emotional response to stimulus. Anger is thought to increase the risk of CVD through chronic cardiovascular reactions to stress. Anger is associated with a poor prognosis in patients with coronary artery stenosis and is a risk factor for CVD. Anger can stimulate cardiac ischemia and ventricular arrhythmias and predict adverse cardiac events.[2] Stric &Stepto (2004) mentioned that the relationship between anger and coronary artery disease is strong and stable. This fact is supported by data on male mortality from a large sample in a prospective study by Eaker, Sullivan, Kelly-Hayes, D Agostion & Benjamin (2004), and by interesting research by Richardson[3] on the relationship between expressions.

A face performed with local anemia has been confirmed. Khalili et al.[4] also concluded that the number and severity of coronary artery occlusion has a strong relationship with anger and hostility. Hence, cardiovascular patients need skills to be able to cope more with stressful situations. Daily stress, which may not be threatening to normal people, is an important risk factor for cardiovascular patients. The patient needs to increase resilience to these daily stresses. Predisposing to cardiovascular disorders and affecting the lifestyle of patients are prone, and it seems necessary to study and address in order to find ways to combat such factors. One of the effective actions in this field is to take correct care by considering all aspects. There are a variety of ways to control these factors. Analysis by Linden et al.[5] indicates that psychological therapies are effective in decreasing mortality and recurrence in patients with coronary heart disease, although reducing recurrence of cardiovascular disease has only been seen in long-term follow-ups lasting more than 2 years.[5] One of the methods of psychological treatment of cardiovascular patients is emotional regulation. Emotion regulation means people trying to influence the type, time and manner of experience and expression, change the duration or intensity of behavioral, experimental or physical processes of emotions and be done automatically or controlled, consciously or unconsciously through the use of emotion regulation strategies. Strategies such as reassessment, rumination, self-expression, avoidance and inhibition.[6] These methods can help the patient's mental health by reducing perceived stress, anxiety and increasing resilience. Increasing mental health will strengthen the immune system to deal with various diseases. Improvement in many chronic diseases such as cancer, cardiovascular disease, diabetes and gastrointestinal diseases influences mental health. Experience of stressful life events has been introduced as an important risk factor for coronary artery disease. People experience a large number of stressful and negative events before heart disease develops.[7] Emotion regulation, either as a strategy that is activated before an accident happens and to prevent the occurrence of intense emotions, or as strategies that are activated after an accident or after an emotion. Emotional regulation strategies that are activated before a stressful event cause to change and interpret the situation in a way that reduces the emotional responses associated with that situation. Emotional inhibition as a negative strategy in emotion regulation leads to cardiovascular disease and cognitive reassessment of emotions as a positive emotion regulation strategy leads to lowering blood pressure.[8] Another method of psychological treatment of cardiovascular patients is progressive muscle relaxation.[9] Progressive muscle relaxation or active relaxation (PMR) is a

technique in which a person feels relaxed by active contraction and then relaxation of specific muscle groups in a progressive state.[10]

There is growing evidence that relaxation training as part of an educational program for heart patients can have significant physiological and psychological benefits for patients after myocardial infarction (Robert, et al., 2002). Although methods of muscle relaxation and emotional regulation can be used as psychological methods to influence various psychological variables in normal people, in many research, the simultaneous effectiveness of these methods on the variables in this study is not clearly defined. Psychological variables are associated with chronic diseases, especially cardiovascular diseases.[11] So, this research tries to answer the question of whether the emotion regulation method according to the grass model and the muscle relaxation technique are any impact on variables, resilience and anger in patients with coronary heart disease. And which of the two methods is more influential on resilience and anger variables in patients with coronary heart disease?

MATERIAL AND METHODS

The research method of the current research is quasi-experimental and the pretest-posttest design and follow-up with the control group. The statistical population of the research consists of all patients with coronary heart disease (CHD) who are aged between 30 and 50 years old who and have referred to medical centers and private clinics of cardiologists in Ilam in 1400. The sample was 11030 people, of which according to the introduction of people by 60 medical centers and specialists were selected. Sampling method in this research was used among volunteers and available sampling was used, but they were distributed randomly in 3 groups, that is, 60 people were drawn by lot into two groups of experimental (20 people each) and control (20 people).), So that, based on to the criteria for entry and exit to the study, the first experimental group under the training of emotion regulation based on the Gross model (20 people), the second experimental group under the training of Benson muscle relaxation exercises (20 people), and a control group are 20 people who answered the Connor and Davidson (2003) Resilience Scale and Judith Siegel (1986) Anger Questionnaire as a pretest. Then, the first experimental group was trained in emotion regulation based on the Gross model (20 people) in 9 sessions, each session for 90 minutes in groups and once a week, the second experimental group was trained in exercises Benson muscle relaxants (n=20) in 9 sessions, each session lasting 90 minutes in groups and once a week, and a control group of 20 people were without intervention. Lastly, all three groups replied to the standard resilience and anger scales in the post-test and the achieved scores of all three groups were compared in the post-test.

Ultimately, after the post-test in order to follow the impacts of the training course, a follow-up test was performed after two months. Given the present research design consists of three stages, the scores of the three stages were compared in three groups. Also, the research samples were in emotion regulation groups based on Gross model, Benson muscle relaxation exercises and control, in terms of marital status, education, job status, number of children and peer age (homogeneous). The Resilience Scale was designed by Connor and Davidson in 2003 and has 25 questions with a Likert scale ranging from zero (completely incorrect) to four (always correct). The mean score on this scale will be 52. So that the higher the subject score is 52, the higher the resilience and the closer the score is to zero, the less resilience. In order to represent the reliability of the scale, Cronbach's alpha method was used and the obtained reliability coefficient was equal to 89%. In Samani, Jokar, and Sahragard[12] research, the reliability of this scale in students using Cronbach's alpha coefficient is 87% was obtained and the results of factor analysis test on this questionnaire showed the existence of a general factor in the scale. This factor determines 26.6% of the variance of the whole scale. In the current research, the reliability of Conner and Davidson (2003) Resilience Scale among a sample of coronary heart disease in Ilam city using Cronbach's alpha coefficient a value of 0.81 was obtained, which indicates the appropriate reliability of the scale. The Anger Scale was developed by Siegel (1986) to show the complexity of anger emotion. The Anger Scale is a 30-item test designed to evaluate anger, and the 30-scale question is explained in 9 items (sub-questions). The test questions on a 5-point Likert scale range from a score of one (completely incorrect) to a score of five (completely correct). The psychometric properties of the Anger Scale have been confirmed in foreign research (Siegel, 1986). Besharat et al.[2] in the Persian form of this Cronbach's alpha scale reported the total scale of 0.75 student samples, which is a sign of good internal consistency of the instrument. In this paper, the reliability of Siegel (1986) anger scale in a sample of coronary heart disease

in Ilam city using Cronbach's alpha coefficient 0.77 was obtained, which representss the proper reliability of the scale.

RESULTS

In Table 1, the mean and normal results of Shapiro-Wilk test (Sig.) resilience and anger of coronary heart patients in the Ilam city in the pre-test stages, after test and follow-up are provided separately for groups, is represented.

TABLE1- *Mean and normal results of Shapiro-Wilk test Resilience and anger scores of coronary heart patients.*

Variable		**Resilience**			**Anger**		
Group	Test level	**M**	**SD**	**Sig.**	**M**	**SD**	**Sig.**
Emotion regulation based on Gross model	Pre-test	58.75	2.04	0.438	163.10	3.689	0.446
	Post-test	74.60	1.91	0.126	148.95	3.90	0.553
	Follow up	74.10	1.61	0.599	147.25	3.26	0.757
Benson muscle relaxation exercises	Pre-test	56.90	2.87	0.264	154.35	2.41	0.645
	Post-test	67.40	2.66	0.488	134.25	2.73	0.557
	Follow up	66.55	2.60	0.654	139.10	2.97	0.304
Control	Pre-test	61.65	2.77	0.449	158.60	5.59	0.171
	Post-test	58.75	2.72	0.353	157.70	5.50	0.285
	control	59.75	2.72	0.402	157.50	5.50	0.289

The mean results of Table 1 show that the emotion regulation training methods based on Grass model and Benson muscle relaxation exercises caused by table 1 indicate that the normal Shapiro-Wilk (Sig.) test error distributes resilience and anger scores of patients. Coronary arteries in the emotion regulation groups according to Gross model, Benson muscle relaxation exercises and control in the pre-test, post-test and follow-up stages are higher than the significance level of 0.05, which indicates the normal distribution of data. Therefore, the use of parametric tests to analyze this data is allowed. Table 2 shows the results of Crowt-Machley and Greenhouse Geiser test for intrapersonal validity to increase resilience and reduce anger in patients with coronary heart disease in the post-test and follow-up stages compared to the pre-test stage.

Also table shows the normal Shapiro-Wilk test error (Sig.) of the distribution of resilience and anger scores of coronary heart patients in Gross model-based emotion regulation groups, Benson muscle relaxation exercises, and control in the pre-test stages. Post-test and follow-up is higher than the significance level of 0.05, which indicates that the data distribution is normal. So, the use of parametric tests to analyze this data is allowed. As we can see in Table 2, the results of the Machley-Greenley-Gesser Cervit test for intrapersonal validity to evaluate the sphericity of the covariance matrix error related to the variables between the stages of resilience and anger test in patients with coronary heart disease in Ilam have been presented with the effectiveness of emotion regulation training and muscle relaxation exercises.

TABLE 2- *Results of Machley and Greenhouse Geiser test for intrapersonal credibility with the effectiveness of emotion regulation training and muscle relaxation exercises on resilience and anger in patients with coronary artery disease.*

Component		**Machley test results**					
		Mauchly's W		Approx. Chi-Square		df	Sig.
Resilience		0.852		8.957		2	0.011
Anger		0.872		7.702		2	0.021
Component	effect	**Greenhouse-Geiser test results**					
		Greenhouse-Geisser	Type III Sum of Squares	df	Mean Square	F	Sig.
Resilience	Time	0.0871	2408.078	1.742	1382.017	41.755	<0.01
	time*group		2286.656	3.485	656.166	19.825	<0.01
Anger	time	0.886	5069.033	1.772	2860.181	64.293	<0.01
	time*group		2374.233	3.545	669.826	15.057	<0.01

As we can see the results of Machley test in Table 2, the assumption of sphericity of the covariance matrix error related to the dependent variables converted between the stages of resilience and anger test in patients with coronary artery disease with the effectiveness of emotion regulation training, muscle relaxation exercises and the control group is not approved, because the error value of the chi-square test is less than the significance level of 0.05.

Now, considering the inequality of covariances based on the Machley test, the results of the power view of the variance of the variance-covariance matrix dependent variable in Table 3 indicate that the Greenhouse-Geiser test error of resilience and anger in coronary heart patients with emotion-based training according to Gross model, Benson and control group muscle relaxation exercises are less than 0.05 level. Consequently performing repeated measures analysis of variance is not an obstacle for this data. Table 3 indicates the results of repeated measures analysis of variance to evaluate the effectiveness of emotion regulation training methods and muscle relaxation exercises on resilience and anger of coronary heart patients.

TABLE 3- *Results of repeated measures analysis of variance on resilience and anger in patients with coronary artery disease*

Component	**Source of changes**	**MM**	**df**	**MS**	**F**	**Sig.**	**Effect size**
Resilience	stable	743565.339	1	743565.339	2398.777	<0.01	0.977
	group	2522.978	2	1261.489	4.070	0.022	0.125
	error	17668.683	57	309.977			
Anger	Stable	4115059.200	1	4115059.200	4349.430	<0.01	0.987
	Group	7408.933	2	3704.467	3.915	0.026	0.121
	Error	53928.533	57	946.115			

The findings of repeated measures analysis of variance in Table 3 indicate that the test error of the effects between the subjects of emotion regulation training based on the Gross model and the control group on the effectiveness of

resilience and anger of coronary heart patients in Ilam is less than 05 is / 0. Consequently, there is a significant difference between the effects of subjects on Gross model-based emotion regulation training and control in resilience and anger in patients with coronary heart disease. In other words, Gross model-based emotional regulation training on resilience and anger of coronary heart patients in Ilam city has been effective, so that the effect of Gross model-based emotion regulation training on resilience and anger in patients the order is 0.125 and 0.121, which are significant, significant and desirable values. Table 4 represents the findings of the Benferoni post hoc test to compare emotion regulation training methods based on the Gross model and Benson muscle relaxation exercises on resilience and anger in patients with coronary artery disease.

TABLE 4*-Results of Benferoni post hoc test to compare intervention methods on resilience and anger in patients with coronary heart disease*

Component	Group	Group	Average differences	Sig.
resilience	Emotion regulation based on Gross model	Benson muscle relaxation exercises	3.5667	0.272
		Control	9.1000*	0.019
	Benson muscle relaxation exercises	Control	5.5333*	0.046
anger	Emotion regulation based on Gross model	Benson muscle relaxation exercises	10.5333*	0.197
		Control	-4.8333	1.000
	Benson muscle relaxation exercises	Control	-15.3667*	0.025

As results of Benfurney post hoc test in Table 4 show, there is a significant difference between the influence of the emotion regulation group accordding to the Gross model and Benson muscle relaxation exercises in resilience of coronary heart disease patients in Ilam with the control group, because, it has a test error less than the significance level of 0.05. Consequently, patients with coronary artery disease who underwent emotional regulation based on Grass model and Benson muscle relaxation exercises, their resilience changed and based on the positive sign of the difference in means in Table 4, the result is the degree of resilience. Awareness has increased in them. Also, as we can notice in Table 4, there is no significant difference between the influence of the emotion regulation group based on the Gross model and Benson muscle relaxation exercises in the resilience of coronary heart disease patients. Because, it has a test error higher than the significance level of 0.05.

However, Table 4 represents that there is a significant difference between the effectiveness of the Benson muscle relaxation exercises group with the Gross model-based emotion regulation group and the control group in anger of coronary heart patients in Ilam. This result was while the emotion regulation training group was not significantly different from the control group in anger of coronary heart disease patients. In other words, Gross model-based emotion regulation training did not have any impact patients' anger. Accrodongly, patients with coronary artery disease who underwent Benson muscle relaxation exercises changed their anger levels, and due to the negative sign of the difference in means in table 6, we can realize that their anger levels decreased.

DISCUSSION

The current reearch explained that emotion regulation with muscle relaxation exercises was iinfluential in anger and resilience of coronary heart disease patients and the rate of resilience in patients increased and there isn't any significant differnce between the effectiveness of these interventions in patient resilience in coronary arteries. Hereupon, Gai et al. (2018) by using a multiple exploratory model of meditation and cognitive emotion regulation strategies, stated that there is a relationship between resilience and stress responses in patients and in general these factors are related to each other. Kim and Lee[13] explained that people who use emotion regulation dimensions to refocus on positive planning and refocus have shown more resilience.

Pasandideh and Zare[14] stated that resilience based on an emotional regulation program is remarkably difference between the patient and normal groups and patients with coronary heart disease have a lower average in resilience than healthy individuals. Therefore, based on the obtained results, it can be mentioned that training emotional regulation and emotion correction skills along with appropriate physical activity (Benson muscle relaxation exercises), improves resilience and reduces "cardiovascular hyperresponsiveness". Therefore, it can be concluded that due to the high cost and side effects of pharmacological methods to control and increase resilience and dependence on these drugs, non-pharmacological methods such as training and muscle relaxation exercises can be used. Because resilient patients use cognitive emotion regulation strategies such as strategic planning, positive refocusing, and optimistic situational reconstruction

Accepting emotion also increases the ability to cope with difficult situations. This will increase patient resilience. Also, during the conducted sessions, patients were explained that relaxation by balancing the posterior and anterior hypothalamus, decresing the activity of the sympathetic nervous system and the secretion of catecholamines reduces muscle tension and physiological adverse impacts, reduces blood pressure, normalizes respiration, pulse rate and muscle spasm are caused by stress, and Benson relaxation is one of the methods of mindfulness that influences a wide range of physical and psychological signs and symptoms and increases resilience.

Another result of the research was the effectiveness of Benson muscle relaxation exercises on anger in patients with coronary heart disease. In this regard, the results of salehi et al. (2012) showed that teaching methods based on dialectical behavior therapy reduce the symptoms of hostility and aggression of students. Both training methods reduced the symptoms of anxiety, but their effects were different. Avazeh, Azimi, Haji Esmaili et al. (2015) represent that anger management training can increase athletes' ability to control and prevent anger and is one of the possible reasons for improving their ability in moral reasoning. Therefore, in explaining this result, it can be mentioned that Benson muscle relaxation exercises are effective in reducing anger in patients with coronary heart disease. Since muscle contraction is one of the physical symptoms that a person experiences when angry, one of the anger management techniques in this case is a series of relaxing exercises of the muscles. This helps patients to expand by helping a group of muscles to expand. And preventing them from contracting can reduce the physical symptoms of anger and thus overcome it.

Therefore, the implementation of Benson Muscle Relaxation Exercise program inidicates that the nature of this disorder was acute and can be managed with non-pharmacological approaches and prevent people from relying on drug treatments to be safe from unwanted drug side effects to increase the level of health and vitality of patients.

This study showed that Gross model-based emotion regulation training was not effective on anger in patients with coronary heart disease. In this regard, the results of the study of Nouri et al.[15] showed that despite the lack of anger between healthy and sick groups in the paper, it can not be concluded that anger has no inhibitory effect on coronary heart disease. Therefore, in the current research, emotion regulation training according to the Gross model did not lead to an obvious difference in the level of anger in patients with coronary heart disease during 8 weeks. However, the degree of anger of coronary heart patients before the paper indicated meaningful difference between the two groups. The absence of a significant difference between the two groups indicates the similarity of the two groups. It is clear that the need to hold more explanatory sessions and conduct emotional regulation training based on the frequent Gross model for this group of patients is necessary.

Also, this result can be because of the complex nature of anger in coronary heart disease and the effect of various factors such as debilitating symptoms of the disease (pain, sexual disorders, stress caused by the disease, mood disorders, disorders). Based on the findings of the study we can understand that the effectiveness of emotion regulation training and muscle relaxation exercises on resilience and anger of coronary heart patients and to some extent improve the general health of patients with a history of heart problems, so these interventions can be used as a complementary method of medical treatment to improve the general health of these patients.

To sum up, cognitive therapy interventions familiarize the individual with resilience and anger and the type of coping with it, and can help the individual's physiological and psychological functioning by neutralizing the impact of certain pressures.

Therefore, it is clear that by using emotion regulation training and Benson muscle relaxation exercises, some steps can be taken to provide services for patients with or with a history of heart disease and decrease the severity of the disease. Therefore, planning to use both methods to improve the psychological health of patients with coronary heart disease is recommended. So, therapists and psychologists can use it to improve emotional health-related features, especially reducing anger and increasing resilience.

One of the most important restrictions in this research, including individual differences and mood of the samples under study in response to the intervention and the extent of its effect, the effect of environmental factors and culture on the perception of the impact of emotion regulation training relaxation technique on quality improvement the patient's life, the impact of learning and the absence of mental involvement on the effect of these trainings, the debilitating nature of the disease, as well as the presence of the control group. Also, since the information and data of the this research were collected through self-report of the subjects and by a questionnaire, this method is always effected by various influential factors such as the tendency of respondents to provide community-friendly answers, another limitation of the research is considered present.

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