Research Article

The effectiveness of acceptance and commitment therapy on quality of life in patient with myocardial infarction: a randomized control trial

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ABSTRACT
Background: Acceptance and Commitment Therapy (ACT) interventions increase psychological flexibility and improve mental health and quality of life in patients with MI.
Study design:A controlled clinical trial study wasconducted to evaluate the efficacy of an ACT intervention in improving quality of life in patients with MI in Isfahan, Iran.
Methods: The present controlled clinical trial with a pre-post-test design was conducted on a statistical population consisting of patients with MI admitted to hospitals in Isfahan (n=60) who were selected through sequential sampling based on the study inclusion criteria and were randomly divided into a case and a control group ($n_1=n_2=30$). The case group received eight weekly 90-minute sessions of ACT and the control group received no interventions. The pre-test and post-test were administered in both groups using a demographic questionnaire and the Minnesota Living with Heart Failure Questionnaire (MLHFQ) designed to assess the health status of patients with heart failure in terms of quality of life. The data obtained were analyzed in SPSS-20 using descriptive statistics and the ANCOVA.
Results: There was significant increase in quality of life and subscales of mental and physical health thereof, in experimental group ($p < 0.001$).
Conclusions: Considering the effectiveness of ACT in improving quality of life in these patients, this method of intervention can be used as a complementary therapy in healthcare centersto reduce the side-effects experienced by these patients.

Keywords: Acceptance and commitment therapy, Quality of life, Myocardial infarction, Randomized control trial

INTRODUCTION

Myocardial infarction (MI) is one of the most prevalent diseases in many different societies. The incidence of MI has increased significantly in recent years. In the US, almost 650,000 new cases of acute MI and 450,000 cases of MI present to medical centers every year.[1] MI is the

most common cause of death in people aged over 35 in Iran.[2,3] Damage to the heart caused by any disease affects the patient's mental health in addition to causing physical disabilities and symptoms, and MI is no exception. MI is the main complication of coronary diseases and is given special attention due to its high mortality rate, complications, psychological problems, and negative effects on the patients' quality of life.[4]

Quality of life is a major issue that needs to be addressed by health and social professionals The World Health Organization defines it as satisfaction with various important aspects of life, values, goals, standards and individual interests, encompassing psychological, social, economic and family areas.[5] Some studies have shown that cardiovascular diseases affect patients' quality of life as an independent factor.[6] Therefore, in addition to reducing their mortality and increasing their survival, efforts should also be made to give these patients an acceptable quality of life and to identify the factors affecting this variable. Due to the multiple stressors experienced by these patients in daily life, healthcare planners should pay particular attention to the risk of reduced quality of life in patients with cardiovascular diseases.[7]

Acceptance and Commitment Therapy (ACT) is a model that contributes significantly to the promotion of healthy behaviors and the improvement of mental health in patients with chronic diseases, especially in the form of group therapy. This model of therapy has attracted the greatest attention in research and clinical practice in cognitive-behavioral (group) therapy and in affecting behavior change and has thus been confirmed as efficient in most cases. ACT was first introduced by Steven Hayes at the University of Nevada, Reno in 1987 with the acronym ACT. This method of intervention assumes that humans find many of their feelings, emotions or inner thoughts disturbing and constantly seek to change these inner experiences or get free of them. These efforts to control are ineffective and further intensify the feelings, emotions and thoughts the person has initially sought to avoid. The main goal of ACT is to increase psychological flexibility; that is, it seeks to develop an ability in the individual to

make an actual decision between different choices rather than taking action or being forced into action merely to avoid the disturbing thoughts, feelings, memories or desires.[8]

In ACT, psychological flexibility develops through six main processes, including acceptance, diffusion, self as context, commitment, committed action and contact with the present moment, which are classified into two groupings, including mindfulness and acceptance processes and commitment and behavior change processes.[9,10,11] These subjective experiences can include irrational and obsessive thoughts, anger, stress, fears and social anxieties.[12] A major advantage of this method of therapy over other psychotherapy approaches is that it considers motivational aspects along with cognitive ones so as to achieve a longer-lasting treatment effect.[12] ACT has also been reported to increase quality of life in patients with MI and to reduce their depression, stress and anxiety.[13,14,15] A higher acceptance of disease is associated with a greater involvement in personal affairs, the maintenance of compromise, the reduction of confusion and disability and the improvement of psychological well-being.[16] Acceptance of disease therefore seems to be an appropriate strategy for helping patients better cope with their disease and improve their quality of life.

Given the evidence on the importance of the concept of disease acceptance and improvements in psychological functioning, quality of life and compatibility with the health problems faced by patients with MI, and given that MI is currently one of the most prevalent diseases across the world and given the lack of studies on the effect of ACT interventions on quality of life in patients with this condition in Iran, the present study was conducted to evaluate the effect of an ACT intervention on quality of life in patients with MI visiting hospitals in Isfahan in 2015.

METHODS
Trial Design
The present clinical trial was conducted on a case and a control group with a pre-test, post-test and six-month follow-up. The patients were

randomly divided into a case (receiving the ACT intervention in addition to the routine care) and a control (receiving the routine care only) group based on the hospital appointment system.The research setting consisted of Isfahan hospitals and the study population comprised of patients with MI admitted to these hospitals in 2015. The trial design was registered at the Iranian Registry of Clinical Trials under IRCT2016060828339N1 and was approved by ethnic committee of Isfahan University of Medical Sciences.

Participants

A total of 60 patients were selected through simple sequential sampling based on the study inclusion and exclusion criteria and provided their MI diagnosis was confirmed by a specialist. The inclusion criteria for this study consisted of a history of at least one heart attack, age over 30, reading and writing literacy and full consent to participation in the study, and individuals with other physical disorders such as acute renal disease and cancer were excluded from the research.

Interventions

To perform the intervention, the researcher first introduced himself to the subjects, conducted individual interviews with them and briefed them on the study objectives and on how to complete the questionnaires and ensured them of maintaining their anonymity in examining the questionnaires and publishing the results and emphasized the confidentiality of their data.

In order to have the questionnaires completed with a full consent, the participants were ensured that they were free to withdraw from the study at any time they wished. All the questionnaires were filled out individually and the researcher was present when the participants were completing the questionnaires so as to resolve any potential ambiguities. A pretest session was held and both groups responded to the questionnaires. To avoid bias in the results, the quality of life questionnaire was administered by a clinical psychologist (MSc) who cooperated in the research. The case group then received an ACT intervention in eight weekly sessions of 90 minutes. The intervention technique used in this study was the expanded

version of the ACT intervention model, which has been approved in theory and in practice by the Scientific Advisory Board.[9,10] To verify the content validity of the intervention package and its compliance with the study objectives, the text of the package was given to five clinical psychologists fluent in English and familiar with the subject so as to confirm the accuracy of its translation. The text was then presented to a number of students in an informal class so as to confirm their accurate understanding of the content.

Table 1 presents a summary of the content of the ACT intervention sessions. The patients were followed up immediately after the intervention and six months later. To implement a similar method of intervention for the control group, three training sessions were held for the controls in the form of conferences in addition to their completion of the questionnairesand the prepared educational materials were presented to all the members of the control group.

Additional Trial tools

In addition to a demographic questionnaire, the following questionnaires were used in this study to collect the data.

The MinnesotaLiving with Heart Failure Questionnaire (MLHFQ) was developed to assess the health status of patients with heart failure in terms of the quality of life.[17] The MLHFQ is a self-administered questionnaire containing 21 items. Each item is rated on a 6-point scale ranging from 0 (indicating the best state) to 5 (indicating the worst state). The questionnaire has two parts; one part assesses the physical activity limitations and the other part examines the psychological dimension of the patient's quality of life; these parts evaluate the effect of persistent physical symptoms, such as shortness of breath, fatigue, peripheral edema and sleep disorders and also the effect of psychological symptoms, such as anxiety and depression, on the patient's quality of life. The patient's score varies from 0 to 105, with higher scores reflecting a poorer health status. The results obtained from this questionnaire are often reported in three dimensions of health: The physical dimension, the psychological dimension and the overall dimension. A

Cronbach's alpha value of 92% has been reported for the questionnaire. A Pearson's correlation coefficient of 78% has also been reported for the questionnaire through the pre-post test results.[18]

Statistical Analysis

The data obtained in this study were analyzed in SPSS-20 using descriptive statistics, mean and standard deviation, the ANOVA, the paired t-test, the independent t-test, Mann-Whitney's test and the Chi-square test.

RESULTS

The demographic data showed that the mean age of the patients was 57.33 ± 9.42 in the case group and 55.1 ± 9.61 in the control group. The most frequent levels of education in both groups were below high school diploma and high school diploma. In terms of economic status, the results showed that, in the case group, 20% of the participants had a poor, 66.7% had a moderate and 13.3% had a high economic status; in the control group, 26.7% had a poor, 62.1% had a moderate and 11.2% had a high economic status, suggesting that the two groups were matching in terms of gender and the other variables studied. Table 2 presents the descriptive indicators of the two groups.

As shown in Table 3, the repeated measures ANOVA revealed a significant difference in the mean score of overall quality of life between the two groups during the follow-up ($p < 0.001$). The overall quality of life also showed a significant difference over time in each of the groups ($p < 0.001$) (Fig. 1). The interaction of time and group was also statistically significant ($p < 0.001$). Changes in the response variable were different between the two groups at different points in time. Table 3 presents the descriptive indicators pertaining to the pretest, posttest and six-month follow-up scores of quality of life in the two groups and the ANOVA results.

In this study, two general areas of quality of life, including physical and mental health, were examined in the patients. As shown in Table 4, the repeated measures ANOVA revealed a significant difference between the two groups in terms of the mean scores of both the physical and mental dimensions of quality of life during

the follow-up period ($p < 0.001$). A significant difference was also observed in the overall quality of life over time between the two groups ($p < 0.001$). The interaction of time and group was also statistically significant ($p < 0.001$). Changes in the response variable were different between the two groups at different points in time.

Table 4 presents the descriptive indicators pertaining to the pretest, posttest and six-month follow-up scores of the physical and mental quality of life in the two groups and the ANOVA results.

DISCUSSION

The present study was conducted to determine the effectiveness of an ACT intervention in increasing quality of life in patients with MI. The results showed that group therapy based on an ACT intervention improved quality of life in patients with MI immediately after the intervention and six months later ($p < 0.05$).

This method of therapy also improves two general areas of quality of life, namely mental health and physical health. The physical quality of life in patients with MI is an important issue that affects patients after a heart attack. Having to sit or lie down to rest, difficulty in leaving the house, walking and climbing the stairs, sleep disorders due to physical problems and shortness of breath are among the problems with which MI patients are faced. It appears that the physical and mental aspects of quality of life are affected by each other. To explain these findings, it can be argued that quality of life is a multidimensional construct. According to the WHO, quality of life encompasses not only physical and social aspects, but psychological aspects as well. Studies have found that coping strategies and psychological factors, such as anxiety, depression, pain and physical discomfort and their interference with daily activities contribute to quality of life in patients with chronic pain.[5] Since no studies were found in databases on the effect of ACT on quality of life in patients with MI, at least in Iran, this section of the article therefore discusses the results of studies conducted on the effect of this method of intervention on other diseases,

especially chronic diseases. According to a study by Bazzazian et al., patients with higher experiential avoidance experience less positive emotions and life satisfaction and feel that their life is meaningless.[13] Nevertheless, ACT aims to reduce experiential avoidance and increase psychological flexibility through accepting unavoidable, distressing and unpleasant feelings such as anxiety, cultivating mindfulness in order to neutralize excessive involvement with cognitions and identifying personal values related to behavioral objectives. Through ACT, while moving toward their valuable goals, the patients are also encouraged to establish full contact with their experiences without resistance and to accept them as they emerge without judgment of their truth or falsity. This practice increases the motivation for change despite the inevitable barriers and encourages the individual to make efforts for achieving his valuable life goals; this practice thus leads to an improved quality of life, especially in its psychological aspect.[19] Mason et al. and Wicksell et al. also showed that, in addition to improving quality of life in patients with chronic diseases, ACT also reduces the pain experienced.[13, 14]

The reason for the success of ACT is that this approach focuses on functional processes underlying many impaired behavioral manifestations rather than focusing on the form or frequency of the symptoms that are characteristic of a disorder. An ACT intervention does not target a specific diagnostic category, rather the behavioral patterns that hinder a successful life. Instead of focusing on reducing the symptoms, the therapist seeks to improve the patient's overall quality of life with his own cooperation. One of the reasons for the increased acceptance and understanding of disease in these patients may be that, by clarifying their values and goals, they notice that, instead of dealing with things they cannot change (i.e. thoughts, feelings, memories, etc.), they should involve themselves in things they can change (i.e. acting in harmony with their values, etc.).

The patients thus learn that they should move in harmony with their values and goals instead of dealing with unpleasant thoughts and the resulting anxiety and stress. Although this method of intervention deals directly with symptoms such as depression and distressing thoughts, it assumes that when the patient does not attempt to decrease his intrusive thoughts and feelings, or, in metaphorical terms, let's go of the tug of war with his distressing thoughts, mental ruminations, anger, sadness and other internal events, and instead moves toward the goals he has set to match his life values, the symptoms are spontaneously improved too. The cumulative results of this study and studies conducted by Twohig et al. (2006) and Twohig (2007) show that an ACT intervention is a very good technique for dealing with psychological disorders, especially in patients who suffer from the psychological problems resulting from disease complications.[19, 20] Committed action is another process emphasized by ACT, and the proposed treatment protocol also highlighted its role. Encouraging the patients to clarify their values, determine their goals, predict the barriers and ultimately commit to taking actions in harmony with their values despite their illness and the limitations it has caused helps them achieve their goals and acquire happiness while also increasing their understanding of the disease, increasing their control over their own life and improving their quality of life.

CONCLUSION

The present study was conducted to evaluate the effect of an ACT intervention on quality of life in patients with MI. The results obtained showed that this technique can significantly improve quality of life in these patients, especially in its psychological aspect. This study further suggests the need for integrating different fields of science in order to solve problems that have different physical, psychological and social aspects. These types of treatment give meaning to life and improve the patients' quality of life and reduce the costs needed for rehabilitation and treatment as well. This method of therapy can be used in specialized clinics and psychological service centers to solve the psychological problems faced by patients with cardiovascular diseases, especially in patients with a history of MI.

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Table 1. A summary of the content of the ACT intervention sessions.

Session	Intervention/Content
Introduction	Getting acquainted with the patients and establishing a good relationship with them to build trust for getting the questionnaires filled out properly, administering the demographic questionnaire and the pretest
First	Introducing the teaching expert, the group getting acquainted with each other and establishing a therapeutic relationship among themselves, introducing the Acceptance and Commitment Therapy intervention and its main objectives and pillars, setting ground rules for the entire sessions, providing information about heart failure and its complications, reviewing ways to control and prevent disease complications and their costs and benefits, providing psychological education, break and snacks, assigning the homework
Second	Reviewing experiences of the previous session and receiving feedback from the patients, discussing the experiences and assessing them, evaluating the patients' tendency to change, understanding the patients' expectations about the ACT intervention, fostering creative distress, break and snacks, summarizing the presented material and assigning the homework
Third	Reviewing experiences of the previous session and receiving feedback from the patients, identifying inefficient strategies and learning to control them and perceive their futility, explaining the concept of acceptance and its differences with concepts of failure, despair, denial and resistance, teaching that acceptance is a constant rather than logical process, discussing the problems and challenges of a heart attack, explaining how to avoid painful experiences and being mindful of the consequences of avoidance, discovering situations that have been avoided and contacting them through acceptance, defining coping and introducing effective and ineffective coping strategies, break and snacks, summarizing the presented material and an overview of the next session's work, assigning the homework
Fourth	Reviewing experiences of the previous session and receiving feedback from the patients, break and snacks, behavioral commitment and obligation, introducing and explaining confused self-concept and its diffusion, the application of cognitive diffusion techniques, intervention in the performance of problematic chains of language and metaphors, discouraging the patients from wasting their time with thoughts and emotions, summarizing the presented material and an overview of the next session's work, assigning the homework
Fifth	Reviewing experiences of the previous session and receiving feedback from the patients, showing the distinctions between the self, therapeutic experiences and behavior, self as context, weakening the self-concept and self-expression. Through these practices, the participants learn to focus on their activities (such as breathing, walking, etc.) and be mindful of their state at all moments and learn to perceive their emotions, feelings and cognitions and to process them without judgment; that is, they learn to pay attention to their thoughts and emotions but not get attached to their content, break and snacks, summarizing the presented material and an overview of the next session's work, assigning the homework
Sixth	Reviewing experiences of the previous session and receiving feedback from the patients, identifying the patients' values in life and focusing on these values, their elaboration and their power of choice, using mindfulness techniques with an emphasis on the present, break and snacks, summarizing the presented material and an overview of the next session's work, assigning the homework
Seventh	Reviewing experiences of the previous session and receiving feedback from the patients, examining each patient's values and giving further depth to the concepts previously taught, explaining the difference between values, goals and routine mistakes in the selection of values, discussing the potential internal and external barriers to the pursuit of values, the group members listing and sharing their most important values and the potential barriers to their pursuit, discussing the goals related to values and the characteristics of goals among the group, the group members identifying three of their most important values and determining the goals they wish to pursue in keeping with those values, determining the next steps for achieving those goals, break and snacks, summarizing the presented material and an overview of the next session's work, assigning the homework.
Eighth	Understanding the nature of tendencies and commitment (teaching commitment to action), identifying behavioral models compatible with values and developing commitment to act on them, briefly discussing the concept of relapse and preparing to cope with it, reviewing the homework and summarizing the sessions with the patients, the group members sharing their experiences with each other and discussing their gains and unmet expectations, the researcher expressing his gratitude to the patients for attending the sessions, administering the post-test.

Table 2. The demographic characteristics of the patients examined.

Factors			Case	Control	P -value[*]
Group			**Frequency (Percentage)**		
Sex		Female	7 (23.3%)	6 (20%)	0.737
		Male	23 (76.7%)	24 (80%)	
	Age (year)		57.33 ± 9.42	55.1 ± 9.61	0.654
History of hospitalization		No history of hospitalization	2 (6.7%)	3 (10%)	0.826
		Once	10 (33.3%)	9 (30%)	
		Twice or more	18 (60%)	18 (60%)	
Self -evaluation of economic situation		Bad	6 (20%)	8 (26.7%)	0.007
		Moderate	20 (66.7%)	19 (62.1%)	
		Good	4 (13.3%)	3 (11.2%)	
Education status		Below high school education	16 (53.3%)	16 (53.3%)	0.277
		High school diploma	10 (33.3%)	9 (30%)	
		Associate's degree	1 (3.3%)	39 (10%)	
		Bachelor's degree and above	3 (10%)	2 (6.7%)	
Marital status		Single	2 (6.7%)	4 (13.3%)	0.181
		Married	28 (93.3%)	26 (86.7%)	

[*]The results showed the lack of a correlation between the demographic variables and the dependent variable (P ≥ 0.05).

Table 3. The results of the comparison between and within the groups in terms of the overall quality of life.

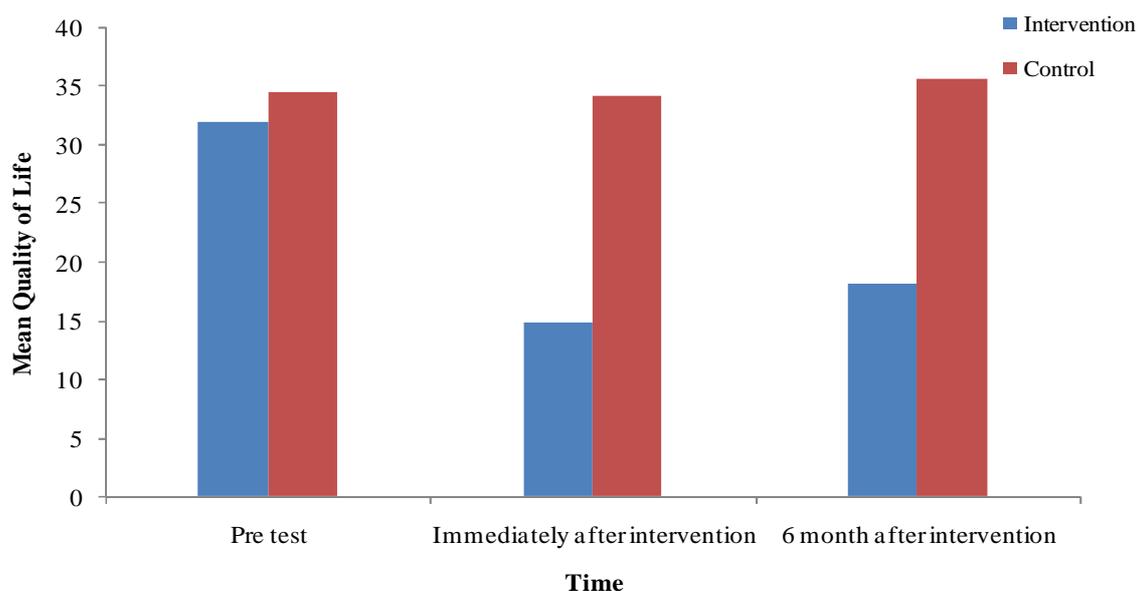| Factors	Time	Pre-test	Immediately after intervention	6 months afterintervention	Time	Group	Time × Group
	Group	**Mean ± SD**			**P-Value**		
Quality of life	Intervention	32.03±14.26	14.8±7.23	18.16±6.06	0.001	0.001	0.001
	Control	34.62±16.34	34.31±16.52	35.75±16.01	0.09		
Group differences in any of the periods		0.519	0.001	0.001	-		

Figure 1: The mean of Quality of life after 6 month

Table 4. The results of the comparison between and within the groups in terms of the physical and mental quality of life.

Factors	Time	Pre-test	Immediately after intervention	6 months afterintervention	Time	Group	Time × Group
	Group	**Mean ± SD**			**P-Value**		
Physical quality of life	Intervention	18.7±9.24	9.23±5.39	11.53±4.59	0.001	0.001	0.03
	Control	18.89±8.94	18.58±9.06	19.58±8.87	0.34		
Group differences in any of the periods		0.934	0.001	0.001	-		
Psychological quality of life	Intervention	8.53±4.98	3.53±2.38	4.13±2.43	0.001	0.001	0.001
	Control	9.6±5.81	9.6±5.81	9.83±5.69	0.182		
Group differences in any of the periods		0.449	0.001	0.001	-		

Figure 2: consort diagram