

THE EFFECT OF COGNITIVE-BEHAVIORAL THERAPY IN REDUCING ANXIETY IN HEART DISEASE PATIENTS

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Abstract

INTRODUCTION: The purpose of this study was to determine the effect of cognitive-behavioral therapy on anxiety reduction and improvement of quality of life in patients with cardiovascular disease.

METHODS: The statistical population comprised patients with coronary artery disease (CAD) in Isfahan in 2006. Fifty-six CAD patients referring to Chamran Heart Center and Isfahan Cardiovascular Research Center (ICRC) were randomly selected and assigned to control and case groups. The case group underwent cognitive-behavioral therapy (CBT) in 8 two-hour structural sessions. Patients in both case and control groups completed Cattel anxiety questionnaire and Mc new life quality questionnaire, which are specific for patients with cardiac disease before, and 2 weeks after therapy. The control group only completed the questionnaires without therapy. Both groups completed another questionnaire, which obtained demographic information.

RESULTS: Based on the results, cognitive-behavioral therapy in the case group led to reduced anxiety and improved quality of life ($P < 0.000$). Our findings showed the effectiveness of cognitive-behavioral therapy in reducing hidden and manifest anxiety ($P < 0.000$) and improving the quality of life, as well as emotional, physical, and social function ($P < 0.000$) in patients with cardiovascular disease.

CONCLUSIONS: We recommend that methods for anxiety reduction and improvement of quality of life be taught to CAD patients via cognitive-behavioral therapy programs.

Keywords: Cognitive-behavioral therapy, anxiety, quality of life, cardiovascular disease.

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Introduction

Despite the reduction of mortality due to cardiovascular disease (CVD) in recent decades, it remains the main cause of death and disability in both males and females.

The prevalence of coronary heart disease (CHD) is rising in developing countries, including Eastern Mediterranean countries such as Iran.¹

Based on a report from the Deputy for Health of Iran Ministry of Health, Treatment and Medical Education, CVD is the most important cause of mortality in Iran, accounting for 46% of all deaths.² Nearly 65% of cardiovascular patients experience psychological conditions such as anxiety and depression, which delay the return to normal life, reduce the quality of life, and increase the risk of death.³

CHD is associated with advanced atherosclerosis and is followed by chest pain, myocardial infarction (MI) and sudden death.

The etiology of CHD and atherosclerosis are complicated and diverse. CHD is not the inevitable consequence of aging and the genetic constitution of individuals; various biological, environmental, behavioral, psychological, social and cultural variables are involved in the etiology and pathogenesis of CHD. Today, cardiologists link CHD with known organic causes such as hypertension, hypercholesterolemia, diabetes mellitus and obesity; however, these are not the only CHD risk factors. Studies have demonstrated that psychological factors interact with conventional risk factors to predispose to CHD. Anxiety is one of the most important psychological conditions which has been extensively studied.⁵

Rapid and sudden advance of heart disease is a severe and frightening psychological experience and anxiety is a common early response. In these patients, fear of occupational, social, sexual and physical dysfunction is added to fear of death.⁶

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Research has shown that the treatment setting is the most important cause of anxiety. The patients are confronted with numerous mental and physical stressors in coronary care units (CCU)⁷ and experience a variety of fears and worries.⁸

Psychological conditions, mainly anxiety, pose as the chief problem affecting heart patients in CCU.⁹

Among other causes of tension in patients, mention can be made of noise, sophisticated equipment, the medical jargon often used by the treatment personnel,¹⁰ unfamiliarity with the treatment setting,¹¹ and hospital costs.¹²

Anxiety is often caused by thoughts of death or symptoms leading to death, such as superficial respiration, severe chest pain, MI complications, and therapeutic methods such as electrical shock and various catheters.¹³

Anxiety and depression in MI patients can adversely affect their mental health and increase their risk of death.¹⁴ The high prevalence of anxiety can result in delayed recuperation of heart patients. Studies show that the costs of care for anxious cardiac patients are four times as high as for non-anxious patients.

Their pharmaceutical expenses also topped those of non-anxious patients by 41%. Long-term anxiety and depression during the recovery phase results in prolonged confinement of cardiac patients due to unnecessary limitation of social functions.¹⁵

In view of the high prevalence of CVD, especially in industrial and developing countries, the key role of anxiety reduction in secondary prevention as an effective therapeutic tool, and within the context of a comprehensive biopsychosocial approach, the present study evaluates the effect of cognitive-behavioral therapy on reduction of anxiety in CVD patients.

Materials and methods

This empirical study uses the pre- and post-experiment model. All CAD patients in Isfahan Province who were on drug therapy and had earlier underwent coronary balloon angioplasty or coronary artery bypass graft surgery (CABG) constituted the study population. The sample consisted of 56 CAD patients at Isfahan Chamran Heart Center and Isfahan Cardiovascular Research Center (ICRC) (2006), who were randomly selected and assigned to case and control groups of equal size (28 patients). A number of patients had medical records at Isfahan Cardiovascular Research Center and others had been admitted to the Internal Medicine Ward and Cardiac Care Units of

Chamran Heart Center to undergo angiography. Two questionnaires were used to collect data:

1. Cattle's anxiety questionnaire was used to assess total anxiety, hidden anxiety, and manifest anxiety in subjects. The questionnaire which consists of 40 triple-choice questions has been tested repeatedly and has always had a reliability of above 70%.¹⁶ In this study, Cronbach's alpha for the questionnaire measured 0.69.

In 1989, the questionnaire was standardized in a sample of 24894 Tehran students majoring in literature, humanities, arts, law, theology, pharmacy, educational sciences, administrative sciences, economics, nursing and social sciences. The sample consisted of 16352 males and 8542 females.¹⁷ Cattle's anxiety questionnaire yields three scores. The final score is the sum total of points gained from the forty items in the questionnaire; it is also equivalent to the sum of scores from the first and second series of twenty questions which assess hidden and manifest anxiety, respectively.

Aligned scores between 4 and 6 suggest a moderate degree of anxiety. Scores between 0 and 3 suggest a calm, phlegmatic, stable, comfortable and tension-free personality.

Scores of 7 and 8 are clearly suggestive of an anxious neurotic state. Scores 9 and 10 indicate that the individual is clearly in need of help, either for counseling or for therapy.¹⁶

SPSS version 11.5 was used to analyze data. T-test was used to compare means of quantitative variables.

2. A questionnaire to collect demographic information, i.e. age, sex, marital status, education, etc.

The objectives of therapy sessions were as follows:

- Inform the patients of the signs of anxiety and its underlying causes
- Explaining the rationale behind cognitive-behavioral therapy to patients
- Helping the patients in identifying negative automatic thoughts
- Replacing negative automatic thoughts with rational thoughts
- Teaching relaxation techniques
- Teaching techniques for effective relationship
- Teaching systematic desensitization techniques to cope with stressor situations
- Teaching assertiveness techniques and scheduling of activities
- Explaining the relationship between thoughts and mood states
- Blocking negative thoughts

The topics addressed in the first to fourth sessions included anxiety and its signs, relaxation, effective relationship, ways of coping with stressor situations, etc. The topics discussed in the fifth to eighth sessions included self-confidence, relaxation without sudden muscle contraction, social skills, the relationship between mood states and scheduling of activities.

At the conclusion of each session, home assignments were given to the patients. They were also supplied with in-depth relaxation cassettes.

Eight 2-hour group education sessions were held in eight consecutive weeks. Before the start of education, the case and control groups filled out demographic questionnaires. Next, they responded to the anxiety questionnaire, the result of which was considered as the pre-experiment score.

For the second time, Cattle's anxiety questionnaire was completed by the subjects at the conclusion of the education period and the score was considered as the post-experiment score.

The case group underwent cognitive-behavioral therapy and the control group remained on the waiting list. The sessions were arranged as instructed by the book *Group Cognitive Therapy*¹⁹ and based on an earlier study.

Results

Prior to statistical analysis, consistency of the groups was examined using the chi square test. The case and control groups were found consistent in terms of demographic variables such as age, sex, marital status and education.

TABLE 1. Case and control group scores before and after the experiment

		Before experiment			After experiment			
		Number	Mean	Standard deviation	Number	Mean	Standard deviation	
Group	Case	Hidden anxiety	28	19.53	3.99	28	17.75	4.63
		Manifest anxiety	28	19.39	7.20	28	14.07	5.88
		Total anxiety	28	38.93	10.07	28	28.78	9.32
	Control	Hidden anxiety	28	16.39	5.64	28	18.11	4.97
		Manifest anxiety	28	14.85	8.13	28	15.57	7.44
		Total anxiety	28	31.25	12.15	28	33.67	11.04

TABLE 2. Mean differences of anxiety scores before and after the experiment and t-test of differences

Groups		Indicator			Significance level
		Size	Mean difference of scores	Standard deviation	
Groups	Case	28	10.14	5.21	0.000
	Control	28	- 2.42	7.89	

TABLE 3. Mean differences of hidden anxiety scores before and after the experiment and t-test of differences

Groups		Indicator			Significance level
		Size	Mean difference of scores	Standard deviation	
Groups	Case	28	4.78	3.42	0.000
	Control	28	- 1.71	5.31	

TABLE 4. Mean differences of manifest anxiety scores before and after the experiment and t-test of differences

Groups		Indicator			Significance level
		Size	Mean difference of scores	Standard deviation	
Groups	Case	28	5.32	4.69	0.000
	Control	28	- 0.71	4.16	

Kolmogorov-Smirnov test (KS-test) was used to examine the normal distribution of anxiety scores. Levene's test was used to examine the homogeneity of variances.

T-test of differences was performed for all variables to test the primary study hypothesis (i.e. effectiveness of cognitive-behavioral therapy in reducing anxiety in heart patients) and the secondary hypotheses.

As seen in Tables 1, 3 and 4, mean hidden and manifest anxiety scores of the case group were lower than those of the control group. Also, t-test of differences for assessing the difference of means between the case and control groups showed a significant difference between the two groups in terms of hidden and manifest anxiety ($P < 0.000$, $P < 0.000$), leading us to the conclusion that cognitive-behavioral therapy is effective in reducing hidden and manifest anxiety in heart patients.

Discussion

This study assessed the effect of cognitive-behavioral therapy in reducing anxiety of heart patients. Based on the results, cognitive-behavioral therapy significantly reduced anxiety in patients of the case group compared to controls (Tables 1 and 2).

Our results are consistent with those of studies on the effect of cognitive therapy and relaxation in reducing anxiety,²⁰ the effect of cognitive reconstruction, thought control and relaxation in reducing anxiety,^{22,23} and the effect of cognitive-behavioral therapy in reducing anxiety and improving cardiac performance.^{3,24-30}

The results of these studies show the effectiveness of cognitive-behavioral therapy (cognitive reconstruction, thought control, relaxation, etc.) in reducing patient anxiety. Based on our findings, we conclude that cognitive-behavioral therapy is an appropriate treatment strategy for reducing anxiety in cardiac patients. Among the desirable outcomes of these techniques - relaxation in particular, mention can be made of their physiological and neurological effects, which can reduce muscle activity, delay spinal reflexes and consequently reduce the excitability of the autonomous nervous system and brain cortex activity; the activity of the sympathetic nervous system decreases and the activity of the parasympathetic nervous system increases.

Increase in vasodilatory neurotransmitters such as acetylcholine induces contraction of smooth muscles of vessels leading to their dilation. Hence, vessels dilate and blood pressure decreases in relaxation state,

resulting in improved cardiac performance. In view of these findings, we recommend that physicians incorporate cognitive-behavioral therapy into common treatment strategies for cardiac patients. We also recommend that psychological rehabilitation be included in therapeutic and educational protocols used in centers for cardiac rehabilitation; this would require the presence of experienced psychologists at heart clinics and cardiac rehabilitation centers, and recognition of cognitive therapy as part of the treatment process for heart patients.

The secondary study hypotheses, i.e. effectiveness of cognitive-behavioral therapy in reducing hidden and manifest anxiety in heart patients was confirmed by our findings (Tables 1 and 3) (Tables 1 and 4); this is consistent with findings of a number of other studies which also demonstrate that cognitive-behavioral therapy benefits heart patients and improves their cardiac performance via decreasing total anxiety, improving thoughts and attitudes (reduction of hidden anxiety), increasing self-sufficiency, reducing hostility, improving interpersonal relations, reducing cardiovascular excitability, improving immunity, and lowering the risk of death.^{6,17,20,24,25,26,28,29}

Cognitive behavioral therapy can be used in combination with, or as an alternative to other treatment methods.

Cognitive-behavioral therapy is superior to drug therapy in certain ways. For example, using the relaxation technique can regulate the autonomous nervous system via a natural mechanism and without the introduction of drugs. Moreover, unlike drug use which is usually accompanied by dependence, tolerance and the need for regular and continuous consumption to produce temporary relief, cognitive-behavioral therapy has no side-effects and has long-lasting and beneficial effects. This method, which can be employed preventively, is easy to perform, cost-effective, readily accessible, and requires no special tools.

We believe it is necessary to establish stress management courses alongside other primary preventive measures against cardiovascular diseases.

On the other hand, with the rise and development of the biopsychosocial model and application of psychotherapeutic treatment methods in pace with other medical advancements in recent decades, universities in many developed countries (e.g. University of Birmingham, University of California, etc.) have developed interdisciplinary fields including medical psychology and behavioral medicine.

Behavioral medicine focuses on behaviors concerned with health and disease; it employs behavioral therapy and behavior modification techniques to treat somatic and psychosomatic disorders.³³ Medical psychology is also a branch of health psychology; it applies social sciences, psychology, and pharmacology to assess and treat somatic disorders.³⁴

We recommend that establishment of the mentioned interdisciplinary fields be given priority in Iran.

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References

1. Lopez-Jaramillo, Cases Jp, Bautista L, Serrano NC, Marillo CA. An intergraded proposal to explain the epidemic of cardiovascular disease in a developing country. From socioeconomic factors free radicals cardiology, 2001; 96:1-6.
2. Sarrafzadegan N, Baghbanian P, Rafiei M, Sadeghi M, Amiri M, Bashardust N, Tavasoli AA. Incidence and morbidity of coronary artery diseases in Isfahan. 2001; Research project conducted by Isfahan Cardiovascular Research Center.
3. Mehrabi T, Ghazavi Z, Nasiri M, Sheikh-al-Salam F. Effect of group therapy on anxiety levels of MI patients. J Res Behavioral Sci 2004;1.
4. Hamrahi M. Relationship of type-A behavioral pattern, psychological signs, and stress experienced in coronary artery disease patients. M.Sc. thesis in General Psychology, 1999; Tehran University.
5. Bayazi MH, Rastegari Y. Relationship of type-2 behavioral pattern, hardiness and stress and coronary artery disease. J Psycho Res. 2005;1&2:40-58.
6. Braunwald, Zips, lippy, Bonow, Heart diseases. 7th Edition. 2004; 70:1976.
7. Salsali M. CCU nursing, coronary artery disease, and principles of cardiac care.
8. Still well S. B. Critical care Nursing. 3rded London: Mosby; 2002; 357-358.
9. Maghsudlu S. Rehabilitation of cardiac patients. First ed. Tehran;Teymurzadeh Publications, 2001; 21.
13. Tomas JY. Reducing anxiety during phase I cardiac rehabilitation. J Psych Res 1995;39(3).
11. Siavash V, Yadollah. Effect of music therapy and body relaxation on anxiety in patients hospitalized in cardiac care units. Andisheh-Va-Raftar Quarterly. 2002; 3(31):75-82.
12. Ockene IS, Doerfler LA, Ockene JK. Psychological and behavioral factors during recovery from myocardial infarction. In: Francis GS, Alpert J. editors. Modern coronary care. 1st ed. Boston: Little, Brown and company 1990;585-588,590.
13. Razmgiri V. Assessment of psychological reactions in 100 patients with ischemic heart disease in Shahid Madani Hospital, Tabriz, Iran. Residency thesis in psychiatry. Tabriz University of Medical Sciences 1997;31.
14. Blumenthal JA, Stein PK, Watkins Catellier, et al. Sluggish heart response May tie depression to heart attack deaths; 2001. Available from URL: <http://www.americanheart.org>
15. AL-Hassan M. SAGR L. Stress and Stressors of myocardial infarction patients in the early period after discharge 2002;40:181-188.
16. Ganji H. Personality evaluation. Tehran; Salavan Publications. 2001;159.
17. Nejabatian M. Effect of cognitive-behavioral therapy on anxiety in students of Shahrekord University of Medical Sciences. M.Sc. thesis in General Psychology. Khorasan Islamic Azad University 2000.
18. Bahadoran K, Pournaseh M. Serenity within (book and audio cassette).Tehran; Mehr Kavian Publications 2003.
19. Free, Michael L. Cognitive therapy in groups, Guidelines and Resources for practice 1999.
20. Barlow DH, Hayes SC, Nelson Ro. The scientist practitioner. Pergamon, oxford; 1984.
21. Butler G, Cullington A, Munby M, Amies P, Gelder M. Exposure and anxiety management in the treatment of Social Phobia. Journal of consulting and clinical Psychology 1984;52:642-50.
22. Durham, RC, Turvey AA. Cognitive therapy vs. behavior therapy in the treatment of chronic general anxiety, Behavior Research Therapy 1987;25:229-34.
23. Belar CD. Graduate education in clinical psychology. "We're not in Kansas anymore". Am Psychol 1998;53(4):456-64.
24. Gay S. Meeting cardiac patients' expectations of caring. Dimens Crit Care Nurs 1999;8(4):46-50.
25. Jacobs GD. Clinical application of the relaxation response and mind-body in interventions. Harvard Medical School and Beth Israel Deaconess Medical Center, Massachusetts 2215, USA; 2001.
26. Burnner Suddarth's. Medical surgical nursing 2004.
27. Beck AT, Emery G, Greenberg RL. American Psychological Association. Anxiety Disorder: The role of psychotherapy in effective treatment, 2004.
28. Stein, G. A randomized effectiveness trial of cognitive behavioral therapy and medication for primary care panic disorder. Archive of General psychiatry 2005;62:290-298.
29. Ethan E, Gorenstein L, Papp M. Cognitive behavioral treatment of anxiety in later life, Colombia University and the New York psychiatric Institutes, USA 2006;6:305-320.
30. Ruhafza HR, Sadeghi M, Rabiei K, Boshtam M, Saidi M. Effect of a course of cardiac rehabilitation on psychological stress in an Iranian population. Journal of Research in Medical Sciences. 8th year; July & August 2003;94-96.
31. Abbass B. Jaleh. Effect of cognitive-behavioral group therapy and drug treatment in treating diffuse anxiety. M.Sc. thesis in Psychology. Tabriz University 2000.
32. Moshaveri AH. Effect of cognitive-behavioral education on anxiety in students of Isfahan University. M.Sc. thesis. Faculty of Psychology, Isfahan. 1993.
33. Manshai Gh. Psychology of Health. Isfahan; Ghazal Publications. First ed. 1999; 6.
34. Wikipedia encyclopedia, Medical Psychology, 2006, http://en.wikipedia.org/wiki/Medical_Psychology.