Effects of a cardiac rehabilitation course on psychological stresses in an Iranian population

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Abstract

BACKGROUND: The complications of cardiovascular diseases (CVDs) including psychological stresses such as anxiety, depression, and hostility, cause disease exacerbation and prolongation and delayed recovery. Beneficial effects of rehabilitation and stress management interventions in reducing such stresses have been reported in some previous studies. Therefore, considering the high prevalence of cardiovascular diseases in Isfahan, Iran, and also the importance of stress reduction in CVD patients, this study evaluated the effects of a cardiac rehabilitation course on psychological stresses among an Iranian population.

METHODS: A total number of 190 patients (40 females and 150 males), who have been introduced by cardiologists to Isfahan Cardiovascular Research Center for rehabilitation following the myocardial infarction and open heart surgery, participated in this study. Patients all took part in an exercise program including 24 one-hour sessions (three sessions per week). Each session consisted of warm-up (20 minutes), aerobic exercise and relaxation (40 minutes). Cognitive-therapeutic group therapy sessions, supervised by a psychiatrist, were also held for 1-2 hours weekly. Furthermore, patients' nutritional pattern was controlled by a nutritionist. All the individuals underwent exercise test at the beginning and the end of the exercise. In addition, anxiety, depression, and hostility were assessed by symptom checklist-90 (SCL-90) before and after the course. The data was analyzed by paired-t and independent-t tests in SPSS.

RESULTS: The exercise volume in all the patients (42.7 ± 81.56 in males and 39.88 ± 33.36 in females) significantly increased at the end of the course. Moreover, scores of anxiety (-17.86 ± 68.49 in males and -32.33 ± 49.53 in females), depression (-12.80 ± 67.4 in males and -16.50 ± 57.84 in females), and hostility (-19.26 ± 71.86 in males and -12.80 ± 123.60 in females) showed a significant reduction at the end of the course ($P < 0.001$). Similar results were seen in both sexes.

CONCLUSION: According to the changes found after rehabilitation, it can be concluded that the conducted rehabilitation program was helpful in reducing stresses among the studied population. Such programs can thus be an effective approach to reduce stress and its outcomes. In addition, there were no significant differences in the effectiveness of the program on psychological factors between males and females.

Keywords: Cardiac Rehabilitation, Exercise Volume, Depression, Anxiety, Hostility.

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Introduction

Subsequent to the increasing prevalence of cardiovascular diseases (CVDs), their complications, including psychological stresses (anxiety, depression, and hostility), have been better identified. Such stresses can exacerbate and prolong CVDs, interfere treatment, and consequently cause delayed recovery.[1]

A number of semi-structured interviews have recently shown that 18% of coronary artery diseases (CADs) also suffered from major depressive disorder

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(MDD) while 27% had depression symptoms.[2] Retrospective studies have indicated that approximately 13% of patients with uncomplicated myocardial infarction (MI) suffered from depression during the first 7 weeks after the disease while the rates are higher among the middle-aged population.[3] On the other hand, depression is directly associated with mortality and morbidity in patients with CADs.[4-10]

The prevalence rate of anxiety is also very high in patients following MI. Patients with CAD experience various levels of anxiety during their admission. The anxiety remains consistent even after acute MI disappears.[3] Moreover, as some studies have indicated, CAD mortality is higher in anxious patients.[7] Furthermore, many MI patients develop higher levels of stresses such as hostility.[11]

The importance of stress reduction in CAD patients, using methods such as cardiac rehabilitation,[12] is thus undeniable considering the abovementioned facts. In previous Iranian studies CADs were found highly prevalent. They have in fact been reported as the main cause of mortality in Iran.[13] On the other hand, Iranians face different types and sources of stress compared to other societies. Therefore, we decided to evaluate the effects of a rehabilitation course and stress management interventions on psychological stresses in an Iranian population. We also tried to make some modifications in the society according to the results.

Materials and Methods

This was a cross-sectional study on patients who were referred to Isfahan Cardiovascular Research Center, Isfahan, Iran by cardiologists to participate a cardiac rehabilitation course after MI or open heart surgery (190 patients including 150 men and 40 women).

At the beginning of the study, a questionnaire was completed by the subjects. The questionnaire included items about full history description, clinical examination, and consumed drugs. Other questionnaires such as a 3-day inventory for assessing diet and the anxiety, depression, and hostility symptom checklist (SCL-90) were also filled out. Thereafter, a fasting blood sample was taken for paraclinical tests. In addition, echocardiography and submaximal exercise test using Naughton protocol were performed to determine disease risk rate. Patients then participated in a 3-stage group rehabilitation program for 8 weeks. The first stage consisted of a 24-session (3 sessions per week) exercise program under the supervision of a physician and a physiotherapist. Each session started with a warm-up of 20 minutes followed by aerobic exercises for 20-40 minutes depending upon patients' ability. The second stage involved relaxation. In this stage, first a psychiatrist explained the importance and advantages of relaxation training. The participants then performed relaxation using a relaxation audio tape. In the last stage, stress management sessions were held as cognitive-therapeutic group therapy under the supervision of a psychiatrist. During these sessions patients were educated on how to reduce depression, anxiety, and hostility symptoms and how to identify the disease and adapt with the current condition. Universalization with other patients, and sense of cohesion and ventilation were also promoted during the 1-2-hour sessions of this stage.

Statistical Analysis

SPSS was used to analyze data through independent and paired t-tests. In all calculations, P values less than 0.05 were considered as statistically significant.

Results

Among the 190 studied patients, there were 150 men with mean age of 53.7 ± 9.5 years and 40 women with mean age of 55.8 ± 7.6 years. There was no significant difference between the two sexes in terms of age ($P > 0.05$).

According to table 1, mean exercise volume of patients increased after the intervention compared to the beginning. In addition, mean scores of depression, anxiety, and hostility had significant reductions in all patients after the intervention ($P < 0.001$).

As table 2 shows, mean exercise volume of both genders significantly increased after the intervention. Moreover, interventions significantly reduced scores of depression, anxiety, and hostility ($P < 0.001$).

Comparisons between men and women revealed mean changes in exercise volume and hostility scores to be higher in men. On the other hand, improvements in mean scores of depression and

Table 1. Comparing mean exercise volume and scores of anxiety, depression, and hostility in all patients before and after the cardiac rehabilitation course (intervention)

Variable	Before intervention	After intervention
	Mean ± SD	Mean ± SD
Exercise volume (METs)	9.30 ± 2.74	12.17 ± 2.84
Depression Score	11.63 ± 9.27	8.40 ± 8.25
Anxiety Score	8.48 ± 6.51	6.27 ± 5.23
Hostility Score	6.40 ± 5.24	4.15 ± 4.22

Table 2. Comparing mean exercise volume and scores of anxiety, depression, and hostility in male and female patients before and after the cardiac rehabilitation course (intervention)

Variable	Before intervention	After intervention
Men	**Mean ± SD**	**Mean ± SD**
Exercise volume (METs)	9.74 ± 2.55	12.88 ± 2.51
Depression Score	9.86 ± 7.63	7.67 ± 7.52
Anxiety Score	7.85 ± 5.82	5.95 ± 5.01
Hostility Score	6.25 ± 5.25	4.45 ± 4.38
Variable	**Before intervention**	**After intervention**
Women	**Mean ± SD**	**Mean ± SD**
Exercise volume (METs)	7.10 ± 2.25	9.42 ± 2.37
Depression Score	18.51 ± 11.72	11.23 ± 10.26
Anxiety Score	10.94 ± 8.36	7.51 ± 5.91
Hostility Score	5.18 ± 5.17	2.97 ± 3.40

Table 3. Comparing the mean percentage of exercise volume and scores of anxiety, depression, and hostility in after the cardiac rehabilitation course between men and women

Variable	Women	Men
	Mean ± SD	**Mean ± SD**
Exercise volume (METs)	29.88 ± 23.36	42.72 ± 81.56
Depression Score	-32.33 ± 49.53	-17.86 ± 68.49
Anxiety Score	-16.50 ± 57.84	-12.71 ± 67.43
Hostility Score	-12.80 ± 62.60	-19.26 ± 71.86

anxiety were more in women. However, none of these differences were statistically significant (Table 3).

Discussion

The main finding of the present study was reduction of psychological indexes following cardiac rehabilitation and stress management in both groups of men and women. Previous studies have reported similar results. Old ridge et al. found significant improvements in anxiety and depression levels among MI patients during eight weeks of stress management interventions.[14] In another study, a group patients with high levels of psychological stresses received stress reduction interventions which resulted in significant differences with the control group.[15] Furthermore, Thoresen and Powell reviewed the effects of rehabilitation on men and women and suggested such interventions to reduce psychological indexes (depression, anxiety, and hostility) in both sexes.[16]

Another interesting finding of the present study was that the effects of rehabilitation and stress management interventions were not significantly different between men and women. Most previous studies, including the abovementioned studies, reported stress management approaches such as cognitive-therapeutic group therapy, relaxation training, and sometimes family therapy, to significantly reduce psychological indexes. Disease identification, adaptation with the current situation, positive expectations of patients about the future, learning how to cope with environmental and physical stresses, universalization with other patients, ventilation, and using other coping mechanisms would have been responsible for such improvements. Since none of these factors are related to gender, the absence of a difference between men and women is justifiable.

Finally, the results showed that as rehabilitation program increased the patients exercise volume (both sexes), psychological indexes (depression, anxiety, and hostility) significantly decreased. On the other hand, different forms of stresses have undesirable effects on professional and social functioning of patients as well as prognosis of underlying CVDs and disease prolongation. It can thus be concluded that the conducted rehabilitation program was beneficial in our studied population and can be an appropriate method to reduce stress and its outcomes.

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Conflict of Interests

Authors have no conflict of interests.

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