

# Effects of Psychoeducation on Mental Health in Patients With Coronary Heart Disease

Zahra Bashiri,<sup>1</sup> Mohammad Aghajani,<sup>2,\*</sup> and Negin Masoudi Alavi<sup>3</sup>

<sup>1</sup>Student Research Committee, Kashan University of Medical Sciences, Kashan, IR Iran

<sup>2</sup>Department of Psychiatric Nursing, Infectious Disease Research Center, Faculty of Nursing and Midwifery, Kashan University of Medical Sciences, Kashan, IR Iran

<sup>3</sup>Trauma Nursing Research Center, Kashan University of Medical Sciences, Kashan, IR Iran

\*Corresponding Author: Mohammad Aghajani, Department of Psychiatric Nursing, Infectious Disease Research Center, Faculty of Nursing and Midwifery, Kashan University of Medical Sciences, Kashan, IR Iran. Tel: +98-3615550021, Fax: +98-3615556633, E-mail: aghajani1362@yahoo.com

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## Abstract

**Background:** Patients with coronary heart disease are at high risk for mental health disorders, such as depression and anxiety. Psychoeducation is a well-known intervention for psychiatric patients, but its use has been limited in other health conditions, such as coronary heart disease.

**Objectives:** The aim of this study was to evaluate the effect of psychoeducation on mental health in coronary heart disease patients.

**Patients and Methods:** This randomized clinical trial included 70 patients with coronary heart disease at Shahid Beheshti hospital, in Kashan, Iran, in 2014. The patients were randomly assigned into two groups: the experimental group, which received eight sessions of psychoeducation, and the control group, which received routine care. Data were collected with the Goldberg mental health questionnaire (GHQ) and were analyzed using independent and paired t-tests performed with SPSS version 16.

**Results:** The means of overall GHQ scores were significantly decreased post-test in the intervention group, and the differences between the two groups were statistically significant in the overall GHQ scores ( $P=0.0001$ ). A significant difference was observed between the mean GHQ scores of the intervention group prior to and after the psychoeducational program (PEP) intervention ( $30 \pm 4.66$  vs.  $20.50 \pm 3.30$ ) ( $P=0.0001$ ). No significant changes were observed in the control group pre- and post-test ( $P=0.07$ ).

**Conclusions:** Psychoeducation resulted in improved mental health in patients with coronary heart disease. Therefore, it is recommended that this approach be performed as a complementary, effective, non-invasive, low-cost nursing intervention to reduce psychological problems in these patients.

**Keywords:** Coronary Disease, Education, Mental Health

## 1. Background

Cardiovascular diseases, such as coronary heart disease (CHD), are among the leading causes of death in western countries and in Iran (1). These disorders are responsible for more than 25% of all deaths worldwide (2). In the UK, for example, more than 90,000 people die from CHD each year (3). According to the world health organization, chronic disease causes 70% of deaths globally, with CHD ranking first (4).

It is reported that the age at onset of cardiovascular disease in Iran is approximately 7 - 10 years earlier than in other countries (5). CHD's physical and psychosocial consequences not only increase the mortality rate, but also considerably increase disability rates for a large portion of the country's workers during their best years of productivity, ultimately reducing productivity and increasing the cost of healthcare (6, 7).

Patients with CHD are confronted with several psychological problems (8). Studies have shown that 30% - 72% of CHD patients demonstrate symptoms of depression, and 40% - 65% show symptoms of anxiety (8-10). These two problems, in addition to lack of social support, are among the most common psychological responses in pa-

tients with cardiovascular disease, and they not only increase the use of healthcare services, but also the risk of disease relapse or exacerbation (11) and the costs of acute and long-term healthcare (12).

Treatment with medication is routinely used as the method of choice for CHD. Lifestyle changes are also recommended in order to eradicate or decrease the underlying factors (13). In recent years, alternative therapies, such as music therapy, relaxation, therapeutic massage, and guided imagery, have been used to decrease patients' anxiety and distress related to acute and chronic disorders (14). In addition to the measures cited previously, studies indicate reduced distress, anxiety, depression, and certain psychological problems through the use of psychological treatments, such as cognitive-behavioral therapies, psychoeducational programs (PEPs), and the establishment of support systems. Recently, researchers have focused on using PEPs as a fundamental treatment for patients' psychological problems (12). These methods include training interventions to induce changes in behavioral and cognitive patterns. PEPs are usually aimed at directing the pa-

tients' learning, providing opportunities for them to express their emotions in a safe environment, creating real hope or strengthening it, offering solutions to enhance the patients' self-awareness, and providing opportunities for them to practice their new knowledge (15-17).

Several studies have investigated the effects of PEPs on mental health and psychological problems in patients with different disorders. Luciano et al. (18) studied the effect of a PEP on the general health of patients with fibromyalgia, and reported that the intervention was effective at improving mobility and reducing pain, fatigue, morning tiredness, anxiety, and depression. Guo et al. (19) reported that psychological interventions that provide a supportive environment and cognitive-behavioral therapy can reduce symptoms of depression and anxiety in cancer patients undergoing radiotherapy, improving their health-related quality of life.

However, in a meta-analysis of PEPs, Dusseldorp et al. reported that these methods did not significantly affect anxiety (10 studies) or depression (13 studies) in patients with CHD (20). Moreover, Hartford et al. investigated the impact of telephone-based psychological training with nurses and reported that the intervention did not significantly affect the patients' anxiety after coronary artery bypass grafting (CABG) (21). In another study, Johnston et al. also examined the effects of education and psychological counseling on anxiety, depression, and functional limitations in patients with myocardial infarction; the results showed that the intervention did not significantly affect depressive symptoms (22). In a recent systematic review of psychological interventions for CHD patients and their partners, Reid et al. reported that the effects of psychological interventions for patients with CHD were inadequately studied, and that the available studies were mostly outdated and of poor overall quality, including methodological weaknesses, and they showed a non-significant trend (8). Therefore, further studies in the field of psychological interventions for CHD patients are needed.

A majority of the studies on PEPs have been conducted on patients with psychiatric disorders, while being limitedly implemented in patients with medical disorders, especially cardiovascular disease. However, healthcare providers, including doctors and nurses, have increasingly found that in addition to tending to the physical aspects of patients, it is necessary to pay more attention to their psychosocial needs in order to help them achieve normal lives (23, 24). Therefore, indigenous forms of PEPs may be useful for patients with chronic disease, such as CHD, to help them reach maximum functional health (12, 25).

## 2. Objectives

This study aimed to examine the effects of a PEP intervention on the mental health of CHD patients.

## 3. Patients and Methods

This randomized controlled trial was conducted on 70

patients with CHD who were hospitalized in the coronary care unit (CCU) at Shahid Beheshti hospital in Kashan, Iran, in 2014. According to previous studies (12) and based on the formula of  $\alpha = 0.95$ ,  $1 - \beta = 0.8$ , and  $d = 0.65$ , the sample size was determined to be 35 patients in each group. The patients were recruited into the study consecutively. The subjects who met the inclusion criteria were randomly allocated into experimental and control groups through a randomized block sampling method.

The inclusion criteria were age of 21-65 years, willingness to participate in the study, ability to respond to inquiries and attend meetings, no history of angioplasty or CABG, absence of brain disorders (such as Alzheimer's, stroke, or transient ischemic attack), and ability to read and write in the Persian language. The exclusion criteria were death or migration, the occurrence of any acute or urgent medical or psychological upheaval, and the patient's decision to leave the study. For controlling the confounding variables, patients with substance addictions or known mental and psychological disorders were excluded from the study.

The intervention group underwent eight group sessions of PEP, two sessions per week at two-day intervals, with each session lasting for 45-60 minutes. The content of the PEP intervention was adopted D'Souza et al. (26), McGillion et al. (27), and Karamlou et al. (28). The instrument was completed through patient interviews.

### 3.1. Procedure

Data on the patients' demographics were collected at the start of the study. At the same time, the primary outcome measures were collected for the two groups. The PEP was then initiated in the intervention group.

### 3.2. Intervention

In addition to routine medical care, the experimental group received PEP intervention, which included discussions and training materials on skills for coping with anxiety, with an emphasis on lifestyle, anger management, problem-solving and muscular relaxation techniques, as presented in Box 1 (26-28). All PEP sessions were facilitated by a trained nurse. At the end of each session, assignments were given to the participants to complete at home. The participants' experiences with the assignment were reviewed and discussed at the start of the next session, and then new materials were delivered. During the intervention period, the investigator conducted a 5-10 minutes weekly telephone call with each participant in the intervention group to track the home assignments, answer questions, and organize the sessions. The study questionnaire was re-answered by each participant in the intervention group after the eight PEP sessions.

Patients in the control group only received routine medical care, plus a training pamphlet from the American heart association containing information on general cardiac healthcare (29). These participants answered the study questionnaire at the beginning of the recruitment and again after four weeks.

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**Box 1.** Content of the Psychoeducation Program for CHD Patients

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**Sessions****Session I**

Introducing the participants to each other, presenting the objectives of the procedure, listening to the participants' feelings and problems.

**Session II**

Understanding the nature of CHD, training in a variety of preventive methods, treatments, and disease implications and consequences.

**Session III**

Training on skills for coping with anxiety, with an emphasis on lifestyle

What is anxiety?

Recording anxiety-provoking situations in a diary

Training on anxiety management

1) Use of positive confrontation

2) Modulating anxious thoughts

3) Controlled breathing

Emphasizing proper diet, exercise, prayer, and not smoking.

**Session IV**

Training on anger management

What is anger? What situations cause anger? Anger expression methods.

Anger management methods

1) Changing the environment, leaving the environment

2) How to deal with negative thoughts

3) Problem-solving techniques

4) Expressing anger adaptively

**Session V**

Training on problem-solving skills

Circumstances for application of problem-solving skills.

How to use problem-solving skills

1) Defining and formulating the problem

2) Finding multiple and different solutions

3) Deciding on and selecting a solution

4) Evaluating the effects and consequences of the solution, determining the effectiveness of the selected solution

**Session VI**

Training on skills to deal with depression

Ways to deal with depression

1) Accept unpleasant situations when they are out of control

2) Strengthen personal relationships through social skills, assertiveness, and negotiation skills

3) Examine the situation and re-appraise the initial incorrect assessments

4) Maintain a sense of control

5) Reward accomplishments

6) Control negative thinking

7) Focus on positive thinking

8) Effectively use support systems

**Session VII**

Relaxation training

1) Create a calm environment

2) Be located in a comfortable position

3) Focus on a calming mental picture

4) Have a passive attitude

**Session VIII**

Summarization and conclusion, reviewing the trained materials, receiving feedback from patients.

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### 3.3. Instruments

A two-part instrument was used in this study. The first part contained questions about socio-demographic characteristics (the patient's age, gender, surgical history, and smoking). The second part of the instrument was Goldberg's general health questionnaire (GHQ). The GHQ consists of 28 items that are rated on a three-point Likert scale. The scale has four dimensions: somatic symptoms, anxiety, social dysfunction, and depression. The overall score of the scale indicated the individual's level of mental health, with higher scores indicating a lower level of mental health (30). The possible score for the GHQ questionnaire ranges from 28 to 112. The Persian version of the GHQ questionnaire has been used often by Iranian researchers. Ahmadian (31) confirmed the instrument's content validity and assessed its reliability through the internal consistency method, and Cronbach's alpha ranged from 0.77 to 0.90 for the different subscales. In another study, Ebrahimi et al. reported Cronbach's alpha for the overall Persian scale to be 0.97 (32).

### 3.4. Ethical Considerations

Permission for this study was obtained from the ethics committee of Kashan University of Medical Sciences. Ethical issues in this study involved the assurance of confidentiality and the anonymity of the participants. All participants were informed of the purpose and design of the study, and understood that their participation was voluntary. Participants signed a written informed consent form before their participation. This study was registered in the Iranian registry for clinical trials (IRCT) with registration code 2014060114086N4.

### 3.5. Data Analysis

Data analysis was conducted using SPSS version 13, and descriptive statistics were calculated. Kolmogorov-Smirnov was used to examine the normal distribution of variables, and the Chi-square test was used to compare the distribution of socio-demographic variables in the two groups. The

independent-sample t-test was used to examine the difference between the mean ages of the two groups. The independent-sample t-test was also used to examine the differences between the overall GHQ mean scores, as well as the subscale mean scores in the two groups at the start and the end of the study. In addition, the paired-sample t-test was used to compare the changes in the overall GHQ mean scores of the individual groups at the start and the end of the study. A P value of  $< 0.05$  was selected as significant in all tests.

## 4. Results

The findings of the present study showed that PEP improves mental health and decreases somatic and psychological symptoms, such as anxiety and depression, in patients with CHD. Of the total participants, three in the intervention group were excluded from analysis due to irregular participation. Two participants in the control group died, and another was excluded from analysis due to incomplete answers on the post-test questionnaire. In total, the data of 64 patients were analyzed (Figure 1).

No significant differences were found between the two groups in terms of socio-demographic variables (Table 1).

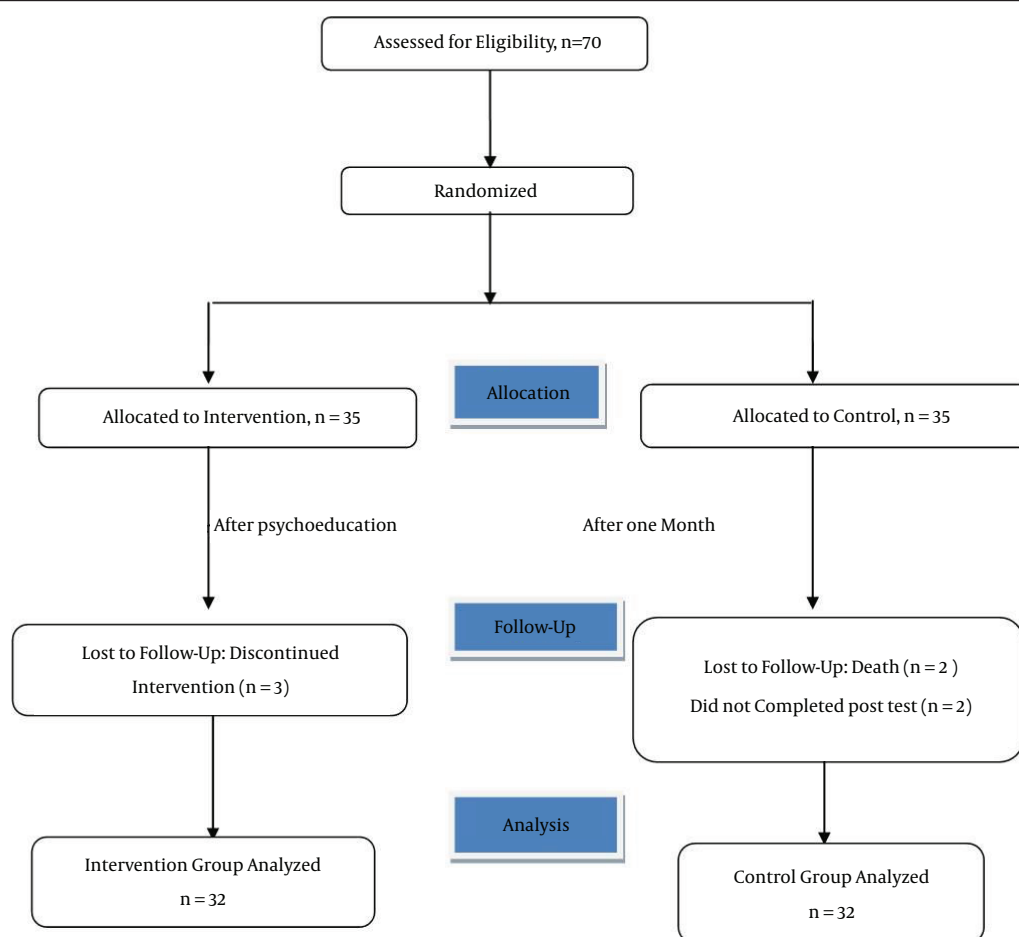
The independent-sample t-test was used to examine the differences between the two groups in terms of the means of overall GHQ scores, as well as the mean scores of the GHQ subscales at the start of the study, and no significant differences were observed in these respects ( $P > 0.05$ ). However, the means of the overall GHQ scores and most of the GHQ subscales were significantly decreased post-test in the intervention group, so that the differences between the two groups were statistically significant in both the overall GHQ scores and in all of the subscales ( $P < 0.05$ ) (Tables 2 and 3).

Using the paired t-test, a significant difference was observed between the mean overall GHQ scores of the intervention group prior to and after the PEP intervention ( $30 \pm 4.66$  vs.  $20.50 \pm 3.30$ ) ( $P < 0.0001$ ). However, no significant changes were observed in the control group between before the study and after ( $P > 0.07$ ) (Table 4).

**Table 1.** Demographic Composition of the Two Randomly Assigned Groups

Demographics	Group <sup>a</sup>		P Value
	Control	Intervention	
Age, y	53.56 ± 8.41	50.12 ± 8.76	0.35
Gender			0.39
Female	19 (59.4)	21 (65.6)	
Male	13 (40.6)	11 (34.4)	
Inpatient history			0.1
Yes	18 (56.2)	12 (37.5)	
No	14 (43.8)	20 (62.5)	
History of basic diseases			0.15
Yes	21 (65.6)	16 (50)	
No	11 (34.4)	16 (50)	
Surgical history			0.14
Yes	13 (40.6)	8 (25)	
No	19 (59.4)	24 (75)	
Smoking			1
Yes	3 (9.4)	4 (12.5)	
No	29 (90.6)	28 (87.5)	

<sup>a</sup>Values are presented as No. (%) except age that is presented as mean ± SD.



**Figure 1.** The Sampling Framework of the Study

**Table 2.** Mental Health Dimensions at the Start of Study

Mental Health Dimensions	Group		t	P Value
	Intervention	Control		
Somatic symptoms	8.44 ± 3.86	9.72 ± 3.55	-1.38	.17
Anxiety	6.22 ± 3.45	6.38 ± 3.94	-0.169	.86
Social dysfunction	6.81 ± 1.76	7.72 ± 3.19	-1.4	.16
Depression	8.53 ± 4.41	6.44 ± 4.03	1.98	.052
Mental health	30 ± 4.66	30.2 ± 10.48	-0.12	.9

**Table 3.** Mental Health Dimensions at the End of Study

Mental Health Dimensions	Group		t	P Value
	Intervention	Control		
Somatic symptoms	4.81 ± 1.39	8.47 ± 3.77	-5.14	.0001
Anxiety	3.59 ± 1.96	10.00 ± 3.55	-8.92	.0001
Social dysfunction	9.66 ± 2.53	7.69 ± 2.05	3.41	.01
Depression	2.44 ± 1.48	7.91 ± 3.45	-8.22	.0001
Mental health	20.5 ± 3.3	35.69 ± 10.49	-7.81	.0001

**Table 4.** Mental Health Before and After Intervention

Group	PEP Intervention		
	Mental Health <sup>a</sup>	t	P Value
<b>Intervention</b>		9.47	.0001
Before Psychoeducation	30 ± 4.66		
After Psychoeducation	20.5 ± 3.3		
<b>Control</b>		-1.83	.07
Before	30.25 ± 10.43		
After One Month	35.69 ± 10.49		

<sup>a</sup>Values are presented as mean ± SD.

## 5. Discussion

The findings of this study showed that PEP improves mental health by decreasing somatic and psychological symptoms, such as anxiety and depression, in patients with CHD. This finding is consistent with the results of Taylor-Rodgers and Batterham, who studied the effects of PEP intervention on the help-seeking attitudes and intentions among young adults with regard to mental health (12). Luciano et al. (18) and Guo et al. (19) have also reported that psychological training could reduce anxiety and depression in patients with fibromyalgia or cancer.

PEPs combine methods of relaxation with psychological training, such as anger management and problem-solving techniques. Several studies have used single methods, such as anger management or relaxation, and reported positive effects. For instance, Ahangarzade and Ezadi reported that anger management training could improve mental health in nursing students (33). Hashemzadeh et al. (10) and Dehdari et al. (11) used relaxation and distraction in patients with cardiac disorders and post-cardiac surgery, and reported that these methods were effective in reducing patients' anxiety. Some studies, such as D'Souza et al.'s also used psychological training, and reported that this method was effective not only in reducing the severity of anxiety and depressive symptoms, but also in decreasing the rate of relapse in patients with bipolar disorder (26). It seems that PEPs have a positive effect on anxiety, depression, and mental health, not only by decreasing muscular tension but also by combining relaxation with improved anger management and problem-solving skills. However, some studies that used PEPs did not find any positive significant effects. This could be attributed to differences in the content and techniques used (34), or to the methods and time-intervals. For example, various studies implemented psychological training methods through telephone contact, email, or CDs (21, 22). It appears that PEP shave a positive impact on mental health, especially if it is applied in a face-to-face approach and is tailored to the individual's culture and lifestyle.

In general, it seems that PEP changes the patient's mental framework, increases his or her awareness of the present moment, and improves the cognitive and informa-

tion-processing systems. Moreover, group-session PEPs show more benefits in facilitating and speeding up the treatment process (14, 35, 36), as they allow patients to be gathered in one place to discuss their problems. This intervention reduces patients' tensions, relieves their negative emotions, and improves their social relationships (37). Therefore, it is recommended that such programs be used in conjunction with other treatments.

This study had some limitations, including its non-blind design and the short follow-up period. Moreover, the psychological status of the patients while answering the questionnaire, and the level of information or support they received from sources other than the investigators, were not under the researchers' control.

Psychoeducation is a well-known intervention for psychiatric patients, but its use has been limited in other health conditions, such as coronary heart disease. The results of this study show that PEP has positive effects on the mental health of patients with CHD. Further studies are suggested, with greater sample sizes and longer follow-up periods at different time-intervals. Studies are also suggested on the barriers to and facilitators of using PEP in practice. Considering the important psychological needs of patients with coronary heart disease, it is suggested that similar interventions be integrated into routine cardiac care plans, and that PEP interventions be added to medical and nursing education curricula.

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## Footnotes

**Authors' Contribution:** Mohammad Aghajani and Zahra Bashiri were responsible for the study's conception and design. Mohammad Aghajani performed the data analysis. Zahra Bashiri performed the data collec-

tion, and Negin Masoudi Alavi contributed to drafting the manuscript.

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