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## Effectiveness of a psychoeducation program on the quality of life in patients with coronary heart disease: A clinical trial

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### ABSTRACT

**Aim:** The present study was conducted to evaluate effectiveness of a psychoeducation program (PEP) on the quality of life in patients with coronary heart disease (CHD).

**Background:** CHD affects patients' quality of life. PEPs may be useful to help patients reach maximum functional health.

**Methods:** A pretest–posttest controlled clinical trial was conducted on a study population of 70 CHD patients, who were selected through convenience sampling and randomly allocated to either the intervention or the control group. The MacNew Quality of Life Questionnaire in heart disease was completed by participants twice: first as a pretest, and then in a follow-up posttest.

**Results:** After the intervention, the quality of life (QOL) score was  $157.97 \pm 25.51$  in the intervention group and  $105.03 \pm 8.38$  in the control group, making for a significant difference ( $p < 0.05$ ).

**Conclusion:** Based on the findings, PEPs helped CHD patients improve their quality of life through reducing tension, relieving their negative emotions, and improving their social relationships.

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### 1. Introduction

Coronary heart disease (CHD) is one of three cardiovascular diseases that are associated with increased mortality and hospitalizations (Berndt et al., 2012). These disorders are responsible for more than 25% of all deaths worldwide (Cole, Smith, Hart, & Cupples, 2011). In the UK, for example, more than 90,000 people die from CHD each year (Kones, 2011). According to the World Health Organization, chronic disease causes 70% of deaths globally, with CHD ranking first (Siavoshi, Roshandel, Zareiyan, & Etfefagh, 2012).

The age at onset of cardiovascular disease in Iran is approximately 7–10 years earlier than in other countries (Khayyam-Nekouei, Neshatdoost, Yousefy, Sadeghi, & Manshaee, 2013). CHD's physical and psychosocial consequences not only increase the mortality rate but also considerably increase disability rates in a large portion of the country's workers during their best years of productivity, ultimately

reducing worker's economic productivity and increasing the cost of healthcare while decreasing quality of life (Sarhadi, Navidian, Harandy, & Moghadam, 2013; Sherme et al., 2009). There are many ways that CHD patients' quality of life may be affected, including symptoms of angina and heart failure, a limited exercise capacity, increased physical debility, and the psychological depression associated with chronic stress (Thompson & Yu, 2003).

The treatment of coronary artery disease is routinely medicinal and non-pharmacological. Non-pharmacological treatment for these patients involves removal of the underlying factors and lifestyle changes (Mohamadi, Ahmadi, Nematipour, & Faghihzadh, 2006). In recent years, alternative therapies have been employed, such as music therapy, relaxation, therapeutic massage, guided imagery (Mandel, Hanser, & Ryan, 2010; Rabito & Kaye, 2013), and psychological treatments that include cognitive–behavioral therapies, and psychoeducational programs (PEPs) (Chan, Yip, Tso, Cheng, & Tam, 2009). PEPs provide a fundamental treatment for patient's problems, and their methods include training interventions to induce changes in behavioral and cognitive patterns. PEPs are usually aimed at directing the patients' learning, providing opportunities for them to express their emotions in a safe environment, creating hope or strengthening it, offering solutions to enhance the patients' self-awareness, and providing opportunities for them to practice their new knowledge. PEPs can be

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used either with individuals, groups, or communities, targeting individuals in high-risk groups (Agren, Evangelista, Hjelm, & Stromberg, 2012; Morokuma et al., 2013; Paranthaman et al., 2010).

Several studies have investigated the effects of PEPs on the quality of life in patients with different disorders. For example, McGillion, Arthur, Victor, Watt-Watson & Cosman (2008); McGillion, Watt-Watson, et al. (2008) reported that PEPs improved physical function, general health, and self-care in the control and reduction of the angina pain of heart disease (McGillion, Watt-Watson, et al., 2008). They also suggested that psychological interventions with longer duration times performed better with these patients. In addition, Martina-Carrasco et al. (2009) studied the effect of PEPs on the quality of life of patients with Alzheimer's and their families, and they reported that the quality of life for both patients and their families increased after psychological training (Martina-Carrasco et al., 2009). In addition, Bagherian, Attaran, Keypor, Kheirabadi, and Maracy (2008) reported that PEP positively and significantly affected the quality of life in patients with COPD (Bagherian et al., 2008). However, some studies that used PEPs did not find any positive significant effects. For example, Lenz and Perkins (2000) reported that psychological interventions had no significant effects on the quality of life in patients with CHD (Lenz & Perkins, 2000). In addition, Tofighian, Najjar, Akabery, and Nakhaee (2009) reported that psychological individual counseling had no significant effect on the quality of life in patients with myocardial infarction (Tofighian et al., 2009). In a review of multiple studies, McGillion, Watt-Watson, Kim, and Yamada (2004) proposed that due to the heterogeneity of interventions approaches and the small sample sizes, stronger and larger studies were necessary to determine the effects of PEP training on improving life for angina patients (McGillion et al., 2004). In a recent systematic review of psychological interventions for CHD patients and their partners, Reid, Ski, and Thompson (2013) reported that the effects of psychological interventions for patients with CHD were inadequately studied, and the available studies were outdated, of poor overall quality, and overall showed a non-significant trend (Reid et al., 2013). Therefore, further studies in the field of psychological interventions for CHD patients are needed.

A majority of studies on PEPs were conducted on patients with psychiatric disorders, only being implemented in a limited fashion in patients with primarily medical disorders, particularly cardiovascular disease. However, healthcare providers, including physicians and nurses, have increasingly found that in addition to tending to the physical health of patients, it is necessary to pay more attention to their psychosocial needs to help them maintain normal lives (Dashtbozorgi, Ghadirian, Khajeddin, & Karami, 2009; Eker & Harkin, 2012). Therefore, indigenous forms of PEPs may be useful for patients with chronic disease, such as CHD, to help them reach maximum functional health (Taylor-Rodgers & Batterhamb, 2014).

## 2. Methods

### 2.1. Aim

This study evaluated the effects of a PEP intervention on the quality of life of CHD patients.

### 2.2. Research design

This randomized controlled trial was conducted using 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 (Mohamadi et al., 2006; Taylor-Rodgers & Batterhamb, 2014), and based on the formulas,  $\alpha = 0.95$ ;  $1-\beta = 0.8$ ; and  $d = 0.65$ , the sample size was determined to be 35 patients in each group. The patients were recruited into the study gradually and based on convenience sampling. The subjects who met the inclusion criteria

were allocated into either the intervention or the control group through a randomized block sampling method.

### 2.3. Participants

The inclusion criteria consisted of people aged 21–65 years, with the ability to respond to inquiries and attend meetings, no history of angioplasty or coronary artery bypass grafting (CABG), an absence of brain disorders (such as Alzheimer's, stroke, or transient ischemic attacks), and the ability to read and write in the Persian language. The exclusion criteria were the occurrence of any acute or urgent medical or psychological problems, substance abuse or addictions, or other known cognitive, mental, or psychological disorders.

### 2.4. Intervention

In addition to routine medical care, the intervention group underwent eight group sessions of the PEP, two sessions per week at two-day intervals, with each session lasting for 45–60 min. The PEP is a specific behavioral therapeutic concept consisting of four elements: briefing the patients about their illness, problem-solving training, communication training, and self-assertiveness training. The content of the PEP intervention was adopted from previous studies (Amirian, Maslakpak, Jalali, Khalkhali, & Salehi, 2013; D'Souza, Piskulic, & Sundram, 2010; Karamlou, Mazaheri, & Mottaghipour, 2010; McGillion, Arthur, et al., 2008), which included discussions and training on anxiety coping skills, with an emphasis on lifestyle changes, anger management, problem-solving, and muscular relaxation techniques, as presented in Box 1. 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. Home assignments were based on each session's training topic. The PEP program consisted of topics including the following: using anxiety management (writing about an anxiety-provoking situation, using positive confrontation, modulating anxious thoughts, control breathing); using anger management (changing the environment, leaving the environment, how to deal with negative thoughts, problem-solving techniques, expressing anger adaptively); using problem-solving skills (defining and formulating the problem, finding multiple and different solutions, deciding on and selecting a solution, evaluating the effects and consequences of the solution, determining the effectiveness of the selected solution); dealing with depression (accepting unpleasant situations when they are out of one's control, strengthening personal relationships through social skills, assertiveness, and negotiation skills, understanding the situation and re-appraising any initial incorrect assessments, maintaining a sense of control, rewarding accomplishments, controlling negative thinking, focusing on positive thinking, effectively using their support systems); and relaxation training (creating a calm environment, being located in a comfortable position, focusing on a calming mental picture, having a positive attitude). The participants' experiences with the homework assignments were reviewed and discussed at the start of the next session, and the trained nurse supported the patients and offered feedback and suggestions on the past session. Then new materials were delivered.

Important factors affected program quality such as facilitation strategies, quality of delivery, and participant responsiveness. In this study, we implemented a simple but specific intervention, providing manuals, guidelines, training, monitoring, and feedback for those delivering the intervention (Carroll et al., 2007). During the intervention period, the investigator also conducted a 5–10 min weekly telephone call with each participant in the intervention group to track the home assignments, answer questions, and organize the sessions. In addition, the study questionnaire was re-answered by each participant in the intervention group after the eight PEP sessions.

Patients in the control group received routine medical care, plus a training pamphlet from the American Heart Association containing

## Box 1

Content of the PEP for CHD patients.

**Session I** Introducing the participants to each other, presenting the objectives of the procedure, and 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 anxiety coping skills, with an emphasis on lifestyle changes. What is anxiety? Record anxiety-provoking situations in a diary. Training on anxiety management:

- 1) Using positive confrontation
- 2) Modulating anxious thoughts
- 3) Using controlled breathing
- 4) 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, or leaving the environment
- 2) Dealing 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) Accepting unpleasant situations when they are out of control
- 2) Strengthening personal relationships through social skills, assertiveness, and negotiation skills
- 3) Understanding the situation and re-appraise the initial incorrect assessments
- 4) Maintaining a sense of control
- 5) Rewarding accomplishments
- 6) Controlling negative thinking
- 7) Focusing on positive thinking
- 8) Effectively using support systems.

**Session VII** Training on relaxation. Ways to create relaxation:

- 1) Creating a calm environment
- 2) Locating a comfortable position
- 3) Focusing on a calming mental picture
- 4) Having a positive attitude

**Session VIII** Summarizing and concluding: reviewing the training materials, and receiving feedback from patients.

information on general cardiac health. These participants answered the study questionnaire at the beginning of the recruitment and again after four weeks.

### 2.5. Assessment instruments

A two-part questionnaire was used in this study. The first part contained questions about sociodemographic characteristics, including the patient's age, gender, marital status, surgical history, and smoking history. The second part of the instrument consisted of the MacNew Quality of Life Questionnaire (QOL) in heart disease. This tool was designed to assess the effectiveness of treatment and training in heart patients and included 27 items in three dimensions, such as emotional health (14 items), physical health (14 items), and social functioning (13 items). Some questions delved into one, two, or all three dimensions. The final score on QOL was derived using the calculated score

for all questions. Question ratings were completed on a seven-point Likert scale: always = 7; almost always = 6; often = 5; sometimes = 4; rarely = 3; almost never = 2; and never = 1. The maximum score on each question was 7, representing the best condition in relation to quality of life, and the minimum score was 1, indicating the worst condition in relation to quality of life. Validity and reliability of the questionnaire were confirmed by study of Höfer, Lim, Guyatt, and Oldridge (2004) on myocardial infarction patients with a correlation coefficient 0.73 (Höfer et al., 2004). The Persian version of the MacNew QOL was also used in the Asadi-Lari, Javadi, Melville, Oldridge, and Gray (2003) study on myocardial infarction patients (Asadi-Lari et al., 2003). In this study, Cronbach's alpha for the emotional and physical dimensions were 0.92, for the social dimension was 0.94, and for the overall scale was 0.95. 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

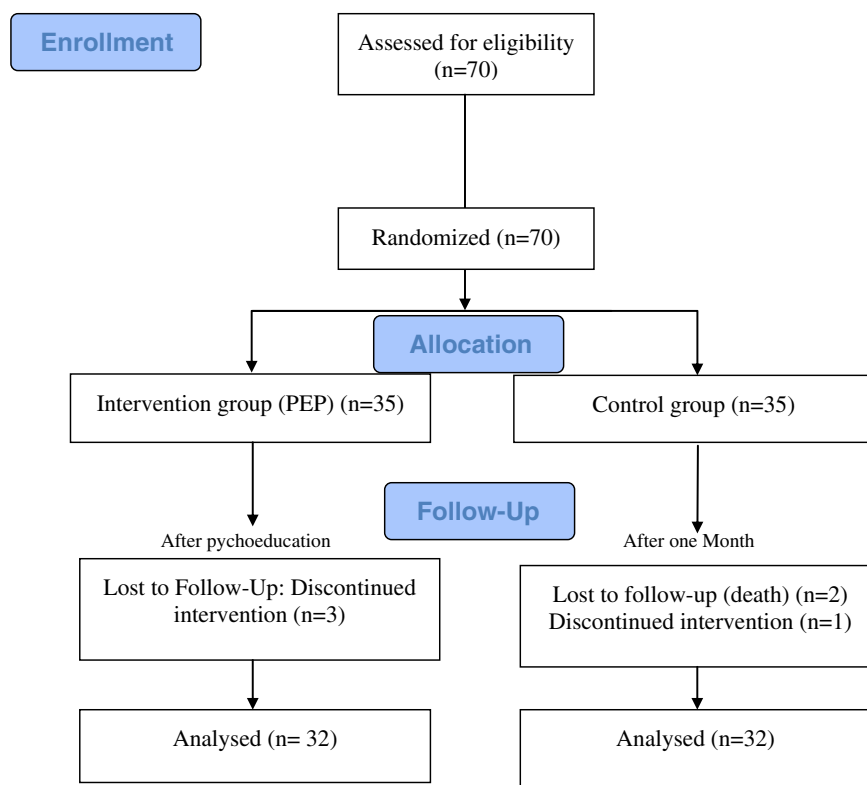


Fig. 1. CONSORT flow diagram.

in the intervention group. Quality of life measured after four weeks in both groups.

### 2.6. Ethical considerations

The protocol of this research project was approved by the Ethics Committee of the School of Nursing and Midwifery of the Kashan University of Medical Sciences based on the Declaration of Helsinki. 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. We respected both the participants' willingness to take part in the study, and any patient's decision to leave the study. Participants signed written informed consent forms before the study began. This study was registered in the Iranian Registry for Clinical Trials (IRCT) with registration code IRCT2014060114086N4.

### 2.7. Data analysis

Data analysis was conducted using SPSS version 13 (SPSS Inc., Chicago, IL, USA), and descriptive statistics were calculated. A Kolmogorov–Smirnov test was used to examine the normal distribution of variables, and the chi-square test was used to compare the distribution of sociodemographic variables within the two groups. An 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 QOL mean scores, and the subscale mean scores within the two groups at the beginning and the end of the study. In addition, a paired-sample t-test was used to compare the changes in the overall QOL mean scores of the individual groups at the beginning and the end of the study. A  $p$ -value of  $<0.05$  was considered significant for all tests.

### 3. Results

Of the 70 total participants, three in the intervention group were excluded from analysis due to irregular attendance. In addition, two participants in the control group died during the course of the study, and another was excluded from analysis due to incomplete answers on the post-test questionnaire. In total, the data of 64 patients were analyzed (Fig. 1).

No significant differences were found between the two groups' clinical–demographic variables (Table 1). An independent-sample t-test was used to examine the differences between the two groups' mean QOL scores ( $96.34 \pm 19.01$  for the intervention group, and  $94.75 \pm 17.61$  for the control group), and the mean QOL subscale scores at the beginning of the study, and no significant differences were observed in these scores ( $p > 0.05$ ) (Table 2). However, both the mean overall QOL scores ( $157.97 \pm 25.51$  for the intervention group, and  $105.03 \pm 8.38$  for the control group), and the mean QOL subscale scores were significantly increased post-intervention for the intervention group. The differences between the two groups were statistically significant in both the overall QOL scores and across all of the subscales ( $p < 0.05$ ) (Table 3).

Using the paired t-test, a significant difference was observed between the mean overall QOL scores of the intervention group prior to and after the PEP intervention ( $96.34 \pm 19.01$  versus  $157.97 \pm 25.51$ ) ( $p < 0.0001$ ). However, no significant changes were observed in the control group's scores when comparing them before and after the study ( $94.75 \pm 17.61$  versus  $105.03 \pm 8.38$ ) ( $p = 0.07$ ) (Table 4).

### 4. Discussion

The findings of this study showed that the PEP improved quality of life across all dimensions for patients with CHD, including emotional health, physical health, and social functioning. These findings were consistent with the results of Martina-Carrasco et al., who reported that PEP training increased the quality of life for Alzheimer patients



**Table 1**  
Demographic characteristic of intervention and control groups.

Variables	Intervention group (n = 32)	Control group (n = 32)	p value
Age (mean + –SD)	50.12 ± 8.76	53.56 ± 8.41	0.35*
Sex			0.39**
Female	21(65.6%)	19(59.4%)	
Male	11(34.4%)	13(40.6%)	
Inpatient history			0.1**
Yes	12(37.5%)	18(56.2%)	
No	20(62.5%)	14(43.8%)	
Underlying diseases			0.39***
None	13(40.6%)	9(28.1%)	
Diabetes	4(12.5%)	6(18.8%)	
Hypertension	5(15.6%)	2(6.2%)	
Hyperlipidemia	3(9.4%)	7(21.9%)	
All three cases	7(21.9%)	8(25%)	
Surgical history			0.14**
Yes	8(25%)	13(40.6%)	
No	24(75%)	19(59.4%)	
Smoking			1**
Yes	4(12.5%)	3(9.4%)	
No	28(87.5%)	29(90.6%)	

\* T-test.

\*\* Fisher test.

\*\*\* Chi-square test.

and their families (Martina-Carrasco et al., 2009), while Bagherian et al. (2008) revealed that PEP positively, significantly improved the quality of life in patients with COPD (Bagherian et al., 2008). Omranifard, Esmailnejad, Maracy, and Jazi (2009) also found that PEP training was an effective, positive factor in the QOL scores of bipolar patients (Omranifard et al., 2009). PEPs combine methods of relaxation with psychological training, including anger management and problem-solving techniques; therefore, the positive effects of PEP on psychological problems such as anxiety and depression could be a significant factor in increasing the quality of life for these patients. Dehdari, Heidarnia, Ramazankhani, Sadeghian, and Ghofranipour (2009) and Hashemzadeh, Mirtaghi, Chalabianloo, and Rad (2011) used relaxation and distraction for patients with cardiac disorders and during the post-cardiac surgery period, and they reported that these methods were effective in reducing patients' anxiety (Dehdari et al., 2009; Hashemzadeh et al., 2011). Some studies, including D'Souza et al. (2010), also used psychological training and stated that this method was effective not only in reducing the severity of anxiety and depressive symptoms but also in decreasing the rate of recurrence of diseases (D'Souza et al., 2010).

PEP training also improved physical function and improved the quality of life for both heart and kidney disease patients. One study reported that PEP training, when used as a complementary treatment in addition to medication, improved the physical activity in hemodialysis patients (Espahbodi, Hosseini, Mirzade, & Shafaat, 2015). Another study also reported that PEP improved physical function, general health, and self-care in the control and reduction of the angina pain of heart disease (McGillion, Watt-Watson, et al., 2008).

However, some studies that used PEPs did not find any positive significant effects (Lenz & Perkins, 2000; Tofghian et al., 2009). Those

**Table 2**  
Comparison of quality of life at the baseline between two groups.

Variables	Intervention group		Control group		t	p value
	Mean	SD	Mean	SD		
Emotional	35.94	6.61	33.84	7.19	1.21	0.23
Physical	34.78	6.79	34.12	8.33	0.34	0.73
Social	25.62	11.30	26.78	7.73	−0.47	0.63
Quality of life	96.34	19.01	94.75	17.61	0.34	0.72

**Table 3**  
Comparison of quality of life at the end of study between two groups.

Variables	Intervention group		Control group		t	p value
	Mean	SD	Mean	SD		
Emotional	54.09	8.16	39.41	4.26	9.01	0.0001
Physical	54.22	8.16	33.78	3.79	12.84	0.0001
Social	49.39	10.08	31.84	2.91	9.44	0.0001
Quality of life	157.97	25.51	105.03	8.38	11.14	0.0001

results could be attributed to differences in the content and techniques used, or to differences in the methods and timelines of the sessions. For example, various studies implemented psychological training methods through telephone contact, email, or CDs (Lenz & Perkins, 2000; Tofghian et al., 2009). PEPs had a significant, positive impact on patient's quality of life, particularly if PEPs were applied in a face-to-face approach and were tailored to the individual's culture and lifestyle.

In general, PEP changed patients' mental frameworks, increased their awareness of the present moment, and improved their cognitive and information-processing systems. Moreover, group-session PEPs showed additional benefits in facilitating the treatment process, because they allowed patients to gather together in one place to discuss their problems and support one another. This group intervention reduced patients' tensions, relieved their negative emotions, and improved their social relationships (Espahbodi et al., 2015; Paranthaman et al., 2010). Therefore, PEP programs worked best in conjunction with group treatments.

#### 4.1. Limitations and suggestions

This study had some limitations, including its non-blind design and a short follow-up period. Moreover, the psychological status of the patients when answering the questionnaire, and the level of information or support they received from sources other than the investigators, which could affect the results of the study, were not under the researchers' control. Further studies are suggested, using larger sample sizes and longer or different follow-up periods at various time-intervals. Studies are also suggested that explore the barriers to PEP implementation and the facilitators who use PEP in practice. However, this study's findings suggested that similar interventions should be integrated into routine cardiac care plans, and that PEP interventions should be added to medical and nursing education curricula.

## 5. Conclusion

Based on these findings, PEPs improved the quality of life for CHD patients. Cardiac nurses should consider this cognitive–educational method as routine patient support and follow-up care for CHD patients with an emphasis on improving patients' quality of life. In addition, considering CHD patients' needs for improved quality of life assistance, PEP interventions should be added to the nursing education curricula and routinely integrated into cardiac care plans.

**Table 4**  
Comparison of quality of life pretest and posttest between two groups.

QOL	Baseline		After intervention		Paired t-test
	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	
Intervention group	19.01 ± 96.34	25.51 ± 157.97			p = 0.001
Control group	17.61 ± 94.75	8.38 ± 105.03			p = 0.07
Independent t test	p = 0.72	p = 0.0001			

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