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Research Paper

The effect of self-care training on happiness and resilience of patients undergoing coronary artery bypass graft surgeries

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ABSTRACT

Background: Self-care training after open-heart surgery is an effective method and nurses can reduce anxiety in patients by providing them the necessary information.
Objectives: This study investigated the effect of self-care training on happiness in patients undergoing coronary artery bypass graft surgery.
Methods: Data collection tools were two questionnaires, demographic information, Oxford Happiness and Connor & Davison Resilience Questionnaire (CD-RISC).
Results: The mean score of happiness in the intervention group increased significantly one month after the intervention (57.36 ± 10.51 versus 64.50 ± 8.05, P = 0.001). The mean score of resilience in the intervention group increased significantly one month after the intervention (56.76 ± 13.00 and 66.46 ± 10.48, P = 0.01).
Conclusion: Self-care training for patients undergoing coronary artery surgery has positive effects on their happiness and resilience. Therefore, it is necessary to pay attention to the principled and planned educational interventions. Routine and codified educational interventions in the wards are sometimes not done as they should be. It is recommended for health care delivery systems to design these training programs in the form of rehabilitation programs.

1. Introduction

Coronary artery disease is the leading cause of death in developing countries [1]. One of the effective methods in treating coronary artery disease is coronary artery bypass grafting [2]. Patients undergoing coronary artery bypass graft surgery may suffer from psychological problems such as anxiety, depression, worry, and fear, which start when the patient is aware of the choice of surgery as a method. Treatment continues until the patient's discharge [3]. Anxiety can be due to fear of surgery, entry to an unfamiliar environment, separation from family, and lack of knowledge and information about how the surgery is performed and its consequences [4]. The results obtained from this study indicated that patients who had moderate preoperative fear showed better postoperative adjustment compared to patients who had more fear [5]. Therefore, every effort should be made to reduce the patient's anxiety [6]. Numerous studies have shown that patients experience less stress when they are resilient [7,8]. Resilience is the process that helps individuals gain emotional abilities to deal effectively with the challenges in the family and social life. There is no specific way to learn resilience because resilience is not a pre-determined skill. Resilience involves the set of skills, attitudes, and values that a person acquires. Among the preliminary skills for cultivating resilience are self-awareness, coping with negative mood and depression skills, anger management skills, stress management, and problem-solving skills [9]. In their study, Frederickson et al. found that subjects with resilient characteristics had reduced cardiovascular response and depressive symptoms [10,11]. Therefore, increasing resilience in individuals enables them to actively deal with issues, face the problems around them, and establish their

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biological, psychological balance in these conditions [12]. On the other hand, the relationship between positive psychological components such as happiness, positive emotions, or optimism with positive results on cardiovascular disease in healthy individuals and heart patients is well known [13]. Happiness is also associated with having some resilience and is significantly dependent on various life skills such as realism, purposefulness, and social competence. As a result, the development of such skills increases people's happiness [14]. Measures should be taken to achieve this goal and reduce anxiety and depression in these patients [15]. In different countries, various methods are used to reduce the patients' anxiety level before surgery; they are holding psychological counseling sessions, watching educational videos, visiting people who have already undergone surgery, playing music before surgery, and introducing patients to operating room staff, and equipment [16]. Undoubtedly, an effective, cost-effective, and practical method to reduce anxiety in patients must be recognized and used. Today, familiarization and education are the most basic care programs in the health care system; therefore, to meet the needs of the patients, education is the best method [17]. Self-care training after open-heart surgery is an effective method and nurses can reduce anxiety in patients by providing them the necessary information [18]. In Iran, there is no study conducted to investigate the effect of education on reducing stress, anxiety [19], and depression [20] on happiness in patients undergoing coronary artery bypass grafting. Therefore, this study aimed to determine the effect of self-care training on happiness level in patients undergoing coronary artery bypass graft surgery at XXXX Heart Hospital in Shiraz in 2020.

2. Materials and methods

This is an experimental intervention study that measures the effect of the independent variable of “self-care education” on the dependent variables of “happiness and resilience” in patients undergoing coronary artery bypass graft surgery. In this experimental study, all patients who had undergone coronary artery bypass graft surgery (open heart surgery) in XXX XXXX Heart Hospital met the inclusion criteria were selected and randomly divided into experimental and control groups. The sample size was determined by the quadruple block method based on a previous study of 30 people in each group.

In the four-block method with the letters A,B in the method that A: control group and B: case were AABB ABAB ABBA, …control group and case group were chosen on different days and dates so the two groups were not related to each other [21] after consultation with a statistician with 90% power, 95% confidence, and a minimum difference of 10 points between the intervention and control groups and a standard deviation of 9.

2.1. Formula for comparing two means

$$n = \frac{2\left(Z_{1-\alpha/2} + Z_{1-\beta}\right)^2 \sigma^2}{d^2}$$

D = 10.

Standard deviation = 9.

Power = 0.9.

Reliability level = 0.95.

The inclusion criteria were willingness to participate in the study, age 65-50 years [22] patients with coronary artery bypass graft surgery, ability to understand and tolerate training sessions, and ability to perform the physical activity by the patient, walk and do the daily personal activities such as bathing. Patients were studied from September 2020 to the end of December 2020. Patients with other chronic and debilitating diseases such as kidney failure under dialysis, respiratory disease, cancer known in any part of the body, and those taking antidepressants were excluded from the study [22] Five selected patients were excluded from the study ،two of them died during the intervention and three others stopped cooperating who were replaced during the duration of the training classes. These conditions were a barrier to attendance in classes, and the duration of the sessions could create critical problems for the patient.

Data collection tools were a three-part questionnaire including demographic information, patient happiness assessment based on the Oxford Happiness Questionnaire, and patient resilience assessment based on the Connor and Davison Resilience Questionnaire (CD-RISC). The demographic information questionnaire contained information such as file number, age, sex, occupation, patient's education level, or patient's companion, which was completed by the researcher. This questionnaire has 29 items that are scored based on a four-point scale ranging from 1 to 4. The validity of this scale is 93%, as confirmed in a study by Alipour. Argil Volvo confirmed the alpha coefficient of 90% with 347 subjects; also, Fonheim and Bronick (1999) reported an alpha coefficient of 78% with 101 participants, and Nouri (2002) with 180 participants confirmed a Cronbach's alpha of 84%. In the present study, the reliability of this questionnaire was confirmed to be 91.7%. The Connor and Davison Questionnaire (CD-RISC) was used to determine the patients' resilience. This questionnaire is a resilience scale with 25 items. This 25-item scale has some components: Competence, personal strength, trust in instincts, tolerance, negative emotions, positive acceptance of change, secure relationships, control, and spirituality that is scored based on a five-point Likert scale. The minimum swing score is zero on this scale, and the score is 100. Mohammadi, in a study using Cronbach's alpha method revealed that the coefficient of validity is 89%. In that study, to determine the validity, first, the correlation of each item with the total score was calculated, and then the factor analysis method was used. Calculation of the correlation coefficient of each option with the total score showed that the coefficients were between 41% and 64% [23]. Also, in the study by Edraki that measured the psychological predictions of resilience in parents of insulin-dependent children and adolescents, ten faculty members approved content evaluation of this questionnaire in the Persian version. Cronbach's alpha coefficients were 92% and 96% [24]. In the present study, the reliability of this questionnaire was determined to be 90.4%

In this study, the patients were randomly divided into four blocks. The control group was trained in a 20-min oral group training session with a presentation pamphlet. Post-discharge routine training for the control group included timely and correct use of medications, adherence to a low-salt and low-fat diet and no consumption of fried foods, training on bathing and care for chest dressings, exercise and walking for 20–30 min two days after discharge so that the person does not get tired and learn how to use a chest bandage, and lack of pressure to the chest. In addition to receiving routine training before discharge, they also received self-care training with an emphasis on happiness and resilience in three sessions of 60 min after the discharge. The training was done first one week after discharge by visiting the doctor's office, then two weeks after the first visit, and finally one month after the first visit. The content of the sessions included an introduction and self-introduction in the first session. There was also an explanation of the general and specific goals of each session, completion of the questionnaires and training related to living with heart disease, approach based on acceptance, and self-care training with an emphasis on happy living methods and techniques to increase

happiness such as changes in life habits, proper use of physical energy to perform activities, exercise as much as possible, and create new mental patterns. The second session included self-care training with an emphasis on resilience enhancement techniques, highlighting stress management. The third session included resilience training and emphasis on problem-solving training; In the fourth session, the emphasis was on comprised resilience training and positive thinking. The fifth session included summarizing the sessions and re-completing the questionnaires of happiness and resilience. After each session, the patients asked their questions orally or communicated with the researcher via SMS and phone call until the next session and their questions from 9 a.m. to 9 p.m. answered daily. Data were analyzed using SPSS software version 18 and statistical tests such as paired T-test and Independent T-test.

3. Results

Based on the objectives, the comparison of the mean scores of happiness in the study groups before the intervention showed that these two groups were identical. The results showed that the average age in the intervention group was 58.13, and 56.07 years in the control group (Table 1). 70% of the participants in the intervention and control groups were men, and more than 90% of the participants in both groups had a diploma and secondary school education. More than 80% of people in both groups were married, and more than 65% of them were unemployed and retired and had relative physical ability (Table 2). Other results of this study showed that more than 55% of people in the intervention and control groups did not use any mobility aids. The two groups were not statistically significant and homogeneous in terms of different variables including age, gender, level of education, marital status, employment, physical ability, and mobility aid (Table 2). The mean score of happiness in the intervention group increased one month after the intervention (before training 57.36, after one month of training 64.5). However, in the control group, the mean happiness score decreased during this period (53.83−52.36). The two groups showed a statistically significant difference in terms of the mean happiness score (Table 3). The mean score of resilience in the intervention group increased one month after the intervention (before training 56.76, after one-month training 66.66). However, in the control group, the mean score of happiness decreased during this period (45.80−44.86). The two groups had a statistically significant difference in terms of the mean variable score of resilience after the intervention (Table 4).

4. Discussion

This study aimed to investigate the effect of self-care education on the happiness and resilience of patients undergoing coronary artery bypass graft surgery.

The findings of this study showed that the happiness score changed over time between the two control and intervention groups. In the intervention group, the happiness score increased since the beginning of the intervention, and one month later. Therefore, according to a recent study [25], increasing happiness in the intervention group means positive thinking and learning to live happily. Findings of the present study and that of a meta-analysis study on more than 50 positive psychology intervention studies in more than 4000 subjects showed that people who have a positive attitude after receiving interventions experienced an increase in happiness and a reduction in depression as well as progress in well-being, which is consistent with the present study [26].

Research confirms the positive effects of optimism as an essential factor for the treatment of heart disease and faster recovery after cardiovascular surgery [27]. In line with these studies, training sessions on positive thinking in Hoffman's study are consistent with the fourth session of the present study. People with happiness also have a more immune system and a better quality of life [28]. According to Fordyce, happiness is a positive emotion that is defined by satisfaction and well-being. He has employed an educational approach in his educational activities that is both cognitive and behavioral. He presented his studies on the possibility of increasing happiness and tested them under controlled conditions. The results of his studies showed that all solutions improved the level of happiness in the subjects. Some of the contents of the Fordyce Happiness Program, such as creating positive thinking, focusing on the present moment, and enhancing social communication are in line with the curriculum of the present study [29]. Based on the findings of this study, the resilience score in the intervention group increased after training. However, in the control group, the resilience score has decreased slightly; this can significantly increase in the intervention group due to receiving problem acceptance training and problem-solving work.

Because, the two components of happiness and resilience are directly related, training that aims at increasing happiness and reducing stress and anxiety can affect the individual's resilience in critical life situations or illnesses. This is consistent with Friedrichson's study, which showed that people with a higher level of resilience can use positive emotions against negative emotional experiences and recover faster after negative emotional arousal [30]. In a study, Kopai Islamians examined the effect of self-care model training on emotional reactions in patients with an intracardiac defibrillator. Since training leads to learning and reduces stress in patients after awareness, and as other studies have shown, happiness in patients with an intracardiac defibrillator can be associated with reduced anxiety and depression in patients; therefore, they confirmed the relationship between increased happiness and decreased stress. It also reduces stress and depression, which leads to consistent information. The intervention was performed in three training sessions of 20−30 min individually and based on the needs identified in the review and cognition stage, which were identified based on the modified form of Orem's needs assessment. Lecture sessions were presented using slide shows, instructional videos, rehearsals, and the provision of an instruction booklet. Self-care training based on Orem's model can effectively reduce the intensity of emotional reactions (anxiety, stress, and depression) in patients with intracardiac defibrillator [31] and helps the patient to focus on personal experience rather than directly on maladaptive patterns of thought, feeling, or behavior [32]. Frederickson showed in his study that people with higher resilience could be more positive than emotional versus negative emotional experiences. They also recover faster from negative cardiovascular arousal [30]; therefore, the results of this study confirm the positive effects of self-care training on increasing happiness and resilience of patients undergoing coronary artery

Table 1
Comparison of the mean age of the patients undergoing coronary artery bypass graft surgery in the intervention and control groups (based on independent *t*-test).

Variable	Intervention (n = 30) ((Mean ± SD	Control (n = 30) (Mean ± SD)	P-value
Age	58.13 ± 4.85	56.7 ± 9.98	0.312

Table 2
Frequency distribution of demographic variables in patients undergoing coronary artery bypass graft surgery in the intervention and control groups (based on Chi-square test and Fisher's exact test to evaluate homogeneity.

Variable	Variable dimensions	Intervention		Control		Pvalue
		Number	**Percent**	**Number**	**Percent**	
Gender	Man	24	80	20	66.7	0.243
	Woman	6	20	10	23.3	
Education level	Illiterate	12	40	8	26.7	0.275
	Primary	8	26.7	14	46.7	
	Tips	6	20	2	6.7	
	Diploma	3	10	5	16.7	
	University	1	3.3	1	3.3	
Marital status	Single	2	6.7	3	10	1.000
	Married	25	83.3	25	83.3	
	Widow	3	10	2	6.7	
Employment status	Unemployed	15	50	15	50	0.777
	housewife	6	20	4	13.3	
	Retired	5	16.7	8	26.7	
	Employed	4	13.3	3	10	
Physical ability	totally	4	13.3	3	10	1.000
	Relatively	7	23.3	8	26.7	
	To some extent	13	43.3	12	40	
	A little	3	10	4	13.3	
	Not at all	3	10	3	10	
Movement aid	None	21	70	17	56.7	0.111
	Cane	7	23.3	5	16.7	
	Walker	1	3.3	1	3.3	
	Wheelchair	1	3.3	7	23.3	

Table 3
Comparison of the changes in happiness mean score before and after the intervention between the control and intervention groups (based on independent *t*-test).

Variable		Before (mean ± SD)	One Month Later (mean ± SD)	P value
Average happiness score	**Intervention**	57.36 ± 10.51	64.50 ± 8.05	0.001
	Control	53.83 ± 11.78	52.36 ± 10.91	0.006
P value		0.226	0.001	

Table 4
Comparison of the changes in resilience mean score before and after the intervention between the control and intervention groups.

Variable		Before (mean ± SD)	One Month Later (mean ± SD)	P value
Average resilience score	**Intervention**	56.76 ± 13.00	66.46 ± 10.48	0.01
	Control	45.80 ± 13.20	44.86 ± 15.65	0.38
P value		0.926	<0.001	

bypass graft surgery. One of the limitations of our study was the small sample size.

4.1. Conclusion

Self-care training for patients undergoing coronary artery surgery influences their happiness and resilience positively one month after the intervention. Ignoring the psychological problems of patients can increase depression, stress, and anxiety in them in these conditions. It can also reduce happiness that is an important part of each person's needs. Therefore, paying attention to principled and planned educational interventions is a necessity.

Routine and codified educational interventions in the wards are sometimes not done as they should be. It is recommended for health care delivery systems to design these training programs in the form of rehabilitation programs at the community level.

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Please state any sources of funding for your research

All sources of funding should be declared as an acknowledgement at the end of the text. Authors should declare the role of study sponsors, if any, in the collection, analysis and interpretation of data; in the writing of the manuscript; and in the decision to submit the manuscript for publication. If the study sponsors had no such involvement, the authors should so state.

Ethical approval

The study is approved by ethics committee of Shiraz University of Medical Sciences (IR.SUMS.REC.1398.549).

Consent

Written informed consent was obtained from patients.

Authors contribution

ZM and MJ: study design and concept, and drafting; FJ and MS: data collection and performing the study; MHK: analysis and drafting. All authors' read and approved the study.

Registration of research studies

The study is approved by ethics committee of Shiraz University of Medical Sciences (IR.SUMS.REC.1398.549).

Guarantor

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix ASupplementary data

Supplementary data related to this article can be found at https://doi.org/10.1016/j.ijso.2022.100454.

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