The impact of self-care training using the teach-back method on health anxiety in patients with coronary artery disease: A randomized controlled clinical trial

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Abstract:

BACKGROUND: Coronary artery disease (CAD) is the most prevalent heart disease and a leading cause of death among both men and women. It is worth noting that anxiety is highly prevalent among patients with CAD, and it can significantly affect their overall performance and well-being. This study aimed to determine the impact of self-care training, specifically using the teach-back method, on health anxiety in patients with CAD.

MATERIALS AND METHODS: In this randomized controlled clinical trial, a total of 50 patients with coronary artery disorders were selected from the coronary care unit of Rasool Hospital in Ferdows City, Iran, in 2022. The participants were randomly assigned to two groups. The intervention group received self-care training based on the teach-back method, which consisted of three individual sessions lasting 30–45 minutes each, conducted over the course of one week. However, the control group received routine care. To collect data, the researchers utilized Salkovskis *et al.*'s (2002) health anxiety questionnaire. The collected data were analyzed using the Chi-square test, Fisher's exact test, independent *t*-test, and paired *t*-test at a significance level of $P < 0.05$.

RESULTS: Most participants in the control and intervention groups were female. The mean ages of the intervention and control groups were 47.1 ± 12.83 and 48.1 ± 44.81 years, respectively, with no statistically significant difference ($P = 0.67$). The results indicated that there was a statistically significant difference in the total mean score ($P = 0.000$) and mean scores of subscales of health anxiety (awareness of bodily sensations or changes ($P = 0.001$), feared consequences of having an illness ($P = 0.001$), and worry about health ($P = 0.008$)) between the two groups.

CONCLUSIONS: The self-care training based on the teach-back method reduced health anxiety in patients with CAD. Therefore, it is recommended to incorporate the teach-back method as an educational approach by nursing team to effectively reduce health anxiety in patients with CAD.

Keywords:
Anxiety, coronary artery disease, health, self-care, teach-back communication

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Introduction

Coronary artery disease (CAD) is a prevalent and critical condition worldwide, including in the United States. It accounts for a significant portion of healthcare expenditures in developing countries and is responsible for approximately 50% of all deaths, as reported by the World Health Organization.[1,2] In 2013, it was recognized as the leading cause of death globally, claiming the lives of over 17.3 million individuals. It is projected that by 2030, the mortality rate will surpass 23.6 million due to the rapid growth of this disease.[3]

Cardiovascular disease is the first cause of death and one million disabilities, which leads to 46% of all deaths and 20–23% of the disease burden in Iran.[4]

CAD presents various challenges, including pain, reduced tissue oxygen supply, decreased tolerance for daily activities, and can lead to mental pressure and anxiety among patients.[1,5] Stress and anxiety are highly prevalent in individuals with CAD and can significantly affect their functional abilities and dysfunction of various organs in the body.[6] Patients with anxiety are at a significantly higher risk of experiencing fatal cardiac events. In addition, the recovery process may be complicated by anxiety.[7] Health anxiety is one of the problems of cardiovascular diseases and is a result of wrong and inappropriate interpretation of physical signs and symptoms, which can affect psychological well-being, quality of life, health, and life satisfaction.[8] Research conducted by Tully *et al*. (2020)[9] demonstrated that anxiety triggered the release of adrenaline, leading to increased heart rate and blood pressure, which could potentially damage arterial walls.

Self-care training has numerous benefits, including improving patient quality of life, ensuring continuity of care, reducing patient anxiety, minimizing the occurrence of disease complications, increasing participation in care programs, enhancing patient independence in daily activities, and reducing costs.[1,10] The self-care deficit nursing theory is comprised of three theories, that is, the theory of self-care, the theory of self-care deficit, and the theory of the nursing system. The nursing systems theory consists of a wholly compensatory nursing system, a partially compensatory nursing system, and a supportive-educative nursing system. Therefore, the nurse uses one of the mentioned systems in the care plan according to the patient's abilities and limitations.[11] Various methods are employed to train self-care such as lectures, question-and-answer sessions, the distribution of pamphlets and educational booklets, and teach-back method. The teach-back method is an interactive educational approach that provides an effective platform for behavioral change. It has been approved by several healthcare organizations and addresses the issue of misunderstanding crucial information in clinical settings.[12] What distinguishes this method from others is that the learner's level of comprehension and skill becomes the determining factor for concluding the educational process.[13] Given the chronic nature of the disease and the teaching approach employed in this method, which involves asking the patient to express their understanding, it appears that this approach can be effective in facilitating better comprehension of the content, and its application, and reducing health anxiety in these patients.

The objective of this study was to determine the impact of self-care training using the teach-back method on health anxiety in patients with CADs.

Materials and Methods

Study design and setting
This study was designed as a randomized controlled clinical trial and was performed in two groups. The study was conducted in the coronary care unit of Rasool Hospital in Ferdows City, Iran.

Study participants and sampling
The target population for this study consisted of all patients with CADs who were admitted to the coronary care unit of Rasool Hospital in Ferdows City, Iran, in 2022. The inclusion criteria for participation in the study were as follows: a specialist-diagnosed CAD, age between 18 and 65 years, basic reading and writing abilities, capability to independently perform self-care tasks, absence of debilitating illnesses, no prior history of mental disorders, not being a part of the healthcare team (neither as a patient nor as a family member), not currently enrolled in other educational programs related to this field, and willingness to cooperate in the study. The study had certain exclusion criteria, which included unwillingness to continue participating in the study, unstable hemodynamic status during the intervention (requiring cardio-respiratory monitoring), and absence from more than one training session.

The sample size was determined using the following formula based on Aghakhani *et al*.'s study,[14] which reported the mean anxiety score in the intervention group (11.67 ± 2.91) and the control group (16.86 ± 5.30) two months after discharge.

$$n = \frac{(Z_{1-\frac{\alpha}{2}} + Z_{1-\beta})^2 \times (\sigma 1^2 + \sigma 2^2)}{(\mu_1 - \mu_2)^2}$$

With a 95% confidence level, a sample size of 18 individuals was calculated for each group. However, to enhance the validity of the research, 25 individuals were included in each group for this study.

A total of 50 patients with CADs were selected from the coronary care unit of Rasool Hospital in Ferdows City. These patients met the inclusion criteria for the study and were chosen using the convenience sampling method. Written and informed consent was obtained from each patient before their participation. They were then randomly assigned to the intervention group (N = 25) and the control group (N = 25). To ensure no contact or exchange of information between patients, a blocked randomization list was created for a one-week

period using SPSS. According to this list, patients were assigned to either the intervention or control group on a weekly basis.

Data collection tool and technique

Before the intervention, health anxiety was assessed using the 18-item Short Health Anxiety Inventory (SHAI). Items assess worry about health, awareness of bodily sensations or changes, and feared consequences of having an illness. The SHAI has demonstrated good reliability and validity. Higher scores indicate more severe health anxiety.[15,16] To assess the reliability of SHAI, Cronbach's alpha method was used, and the obtained coefficient was 0.97.

The researcher completed an educational needs assessment form for the intervention group. Based on the results of this assessment, self-care training was implemented using the teach-back method. This training consisted of three individual sessions, each lasting 30–45 minutes, conducted over the course of one week (every other day). The educational content was developed using reliable and up-to-date scientific sources, and it was approved by cardiologists. Each session focused on the implementation of the education process, evaluation, and decision-making, based on the patient's learning and educational goals. Checklists were used to assess the patient's understanding of the educational content, and the training continued until the patient could recall all the contents according to the checklist [Table 1]. In the control group, patients received routine interventions, which included educational pamphlets. Two weeks after the intervention, patients from both groups were interviewed again and asked to complete the SHAI. To ensure ethical consideration, the educational content provided to the intervention group was also provided to the patients in the control group after the completion of the study. The data were analyzed using SPSS 15. Initially, the normal distribution of the research variables was examined using the Kolmogorov-Smirnov test. In the descriptive analysis, the demographic characteristics of the two groups were compared using the Chi-square test, Fisher's exact test, and independent t-test. For the inferential analysis, since the data followed a normal distribution, independent t- and paired t-tests were used to examine the research hypotheses at a significance level of $P < 0.05$.

Ethical consideration

The research protocol was registered on the Iranian Registry of Clinical Trials website with the identifier IRCT20230523058264N1. It was approved by the ethics committee affiliated with Birjand University of Medical Sciences with the identifier IR.BUMS.REC.1401.146. The study objectives were explained to patients, and informed consent was obtained. They were also assured that the data was confidential and that they could withdraw from the study at any time.

Results

Fifty patients with CADs were enrolled in the study and equally divided into two groups: intervention and control. The data of 50 patients (25 in each group) was finally analyzed [Flow Diagram 1]. Most participants in the control and intervention groups were female with a ratio of 60% (female) and 64% (male), respectively. The mean ages of the intervention and control groups were 47.1 ± 12.83 and 48.1 ± 44.81 years, respectively, with no statistically significant difference ($P = 0.67$). Table 2 presents the comparison of demographic characteristics between the two groups. The results indicated that the patients in both groups were similar in terms of sex, marital status, place of residence, education level, income, employment status, hospitalization history, and age.

Table 3 displays the results of the paired t-test for the intervention group. It revealed a significant decrease in the total mean score and mean scores of subscales of health anxiety after the intervention ($P < 0.001$). Also, Table 3 showed that the total mean score of health anxiety significantly decreased in the control group after the intervention ($P = 0.03$). However, there was no significant difference in the mean scores of subscales of health anxiety (awareness of bodily sensations or changes ($P = 0.27$), feared consequences of having an illness ($P = 0.31$), and worry about health ($P = 0.32$)) before and after the intervention ($P > 0.05$).

Furthermore, the independent t-test results [Table 4] demonstrated that the mean variances in total mean score and mean scores of subscales of the health anxiety were significantly higher in the intervention group compared to the control group after the intervention (overall health anxiety ($P = 0.000$), awareness of bodily sensations or

Table 1: The content of the training program

Session	Content	Educational method	Duration (min)
1	Definition of the disease, causes, risk factors, symptoms of the disease, its complications, and the importance of its prevention and control	Face-to-face training, questions and answers, and providing feedback	30–45
2	Disease prevention and control methods, the role of nutrition, and the effect of proper diet, exercise, and stress control on coronary heart disease	Face-to-face training, questions and answers, and providing feedback	30–45
3	The importance of using medications complying with the treatment and leaving inappropriate habits	Face-to-face training, questions and answers, and providing feedback	30–45
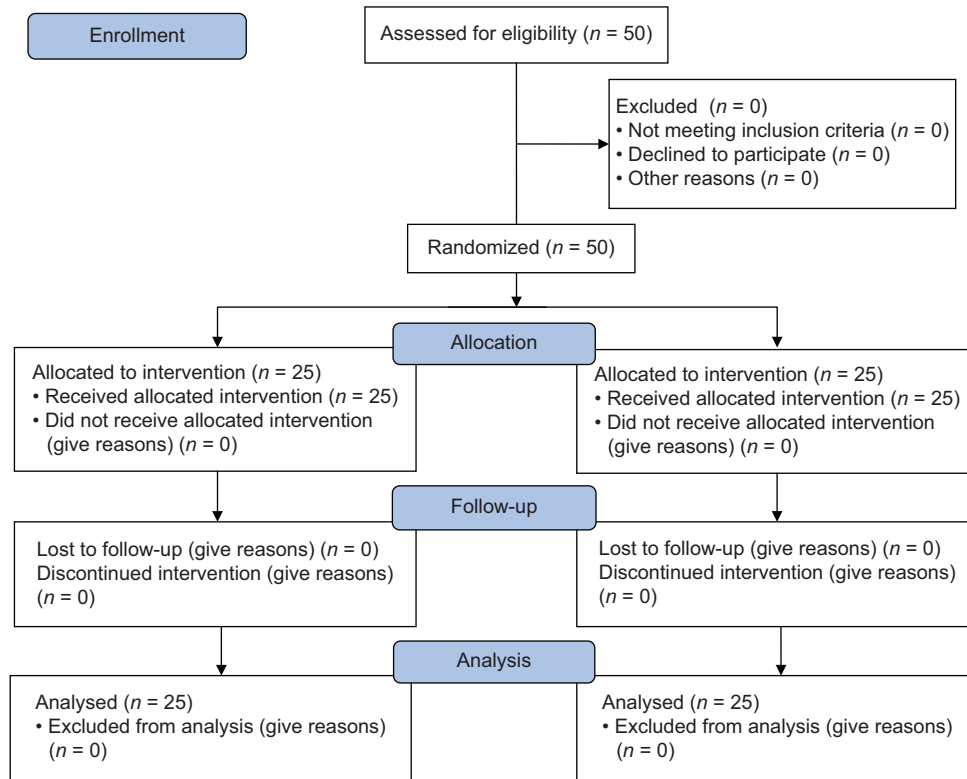
Flow Diagram 1: CONSORT 2010 flow diagram

Table 2: Comparison of demographic characteristics of patients in the intervention and control groups

Variable		Intervention n (%)	Control n (%)	P
Sex	Male	16 (64)	10 (40)	0.09[a]
	Female	9 (36)	15 (60)	
Marital status	Single	3 (12)	3 (12)	1.00[b]
	Married	19 (76)	19 (76)	
	Divorced/widowed	3 (12)	3 (12)	
Place of residence	Ferdows	18 (72)	14 (56)	0.24[a]
	Suburb	7 (28)	11 (44)	
Education level	Lower/upper secondary	12 (48)	9 (36)	0.68[a]
	Diploma	7 (28)	8 (32)	
	Academic	6 (24)	8 (32)	
Income	Sufficient	2 (8)	4 (16)	0.68[a]
	Relatively sufficient	16 (64)	15 (60)	
	Insufficient	7 (28)	6 (24)	
Employment	Employed	12 (48)	16 (64)	0.21[b]
	Unemployed	7 (28)	4 (16)	
	Housewife	3 (12)	5 (20)	
	Retired	3 (12)	0 (0)	
Hospitalization history	Yes	18 (72)	20 (80)	0.51[a]
	No	7 (28)	5 (20)	
Age (mean±SD)		47.1±12.83	48.1±44.81	0.67[c]

[a]Chi-square test, [b]Fisher's exact test, [c]independent *t*-test

changes ($P = 0.001$), feared consequences of having an illness ($P = 0.001$), and worry about health ($P = 0.008$)). In other words, the patients in the intervention group experienced a more significant reduction in the total mean score and mean scores of subscales of health anxiety compared to the control group.

Discussion

The results of the present study indicated that the total mean score and mean scores of subscales of health anxiety significantly decreased in the intervention group after the intervention. Similarly, there was a significant

Table 3: Comparison of the total mean score and mean scores of subscales of health anxiety in both the intervention and control groups before and after the intervention

Group	Variable	Stage	Mean	SD	t	Df	P
Intervention	Awareness of bodily sensations or changes	Before intervention	2.54	0.65	5.25	24	0.000
		After intervention	1.92	0.53			
	Feared the consequences of having an illness	Before intervention	2.78	0.66	6.36	24	0.000
		After intervention	1.94	0.49			
	Worry about health	Before intervention	2.71	0.47	7.69	24	0.000
		After intervention	2.15	0.43			
	Overall health anxiety	Before intervention	2.67	0.52	8.89	24	0.000
		After intervention	2.01	0.41			
Control	Awareness of bodily sensations or changes	Before intervention	2.53	058	1.12	24	0.27
		After intervention	2.46	0.54			
	Feared the consequences of having an illness	Before intervention	2.51	0.60	1.04	24	0.31
		After intervention	2.47	0.59			
	Worry about health	Before intervention	2.53	0.39	1.02	24	0.32
		After intervention	2.48	0.42			
	Overall health anxiety	Before intervention	2.52	0.45	2.33	24	0.03
		After intervention	2.47	0.44			

Table 4: Comparison of the mean variances in total mean score and mean scores of subscales of health anxiety between the intervention and control groups before and after the intervention

Variable	Group	Mean	SD	t	df	P
Awareness of bodily sensations or changes	Intervention	−0.62	0.59	4.19	48	0.001
	Control	−0.07	0.30			
Feared consequences of having an illness	Intervention	−0.84	0.66	5.81	48	0.001
	Control	−0.04	0.19			
Worry about health	Intervention	−0.57	0.37	6.03	48	0.008
	Control	−0.05	0.22			
Overall health anxiety	Intervention	−0.66	0.37	7.87	48	0.000
	Control	−0.05	0.11			

decrease in the total mean score of health anxiety in the control group after the intervention, but no significant difference was observed in the mean scores of subscales of the health anxiety before and after the intervention. Furthermore, the mean variances in the total mean score and mean scores of subscales of health anxiety were significantly higher in the intervention group compared to the control group after the intervention. This suggests that the patients in the intervention group experienced a more significant reduction in health anxiety compared to the control group. This finding can be attributed to the increase in information and knowledge among the patients in the intervention group. The teach-back method used in the study ensured that patients fully understood and comprehended the provided education.[17] As a result, they were able to apply recommended therapeutic and medicinal principles and adhere to therapeutic regimens, leading to a decrease in health anxiety.

No prior studies were found that specifically examined the impact of self-care training using the teach-back method on health anxiety in patients with CADs.

Therefore, the results of this study provide valuable insights into the topic and contribute to the existing body of knowledge. The study conducted by Azizi *et al*. (2020)[18] focused on the effect of teach-back training on treatment adherence in patients with acute coronary syndrome. The results showed a significant increase in the mean score of treatment adherence in both the intervention and control groups three months after the intervention compared to one month later. However, the increase was significantly higher in the intervention group. Aghamohammadi *et al*. (2020)[19] compared the effect of video training and teach-back methods on medication adherence in patients with heart failure. Immediately after the training, both the teach-back and video-based groups showed significantly higher medication adherence compared to the control group. There was no significant difference between the teach-back group and the video-based group. Six weeks after the training, the mean score of medication adherence in the teach-back group was significantly higher than that in both the video-based and control groups. The results of the study by Saadatian *et al*. (2022)[20] showed that teach-back training improves disease perception and self-efficacy in patients with CAD. While previous studies have examined the impact of teach-back training on treatment and medication adherence and self-efficacy, the present study focused on investigating the effect of this intervention on the level of health anxiety in patients. The results obtained are somewhat similar, as self-care training empowers patients to utilize their knowledge, skills, and abilities to independently manage their health, leading to increased treatment and medication adherence and subsequently reducing health anxiety.

In a study conducted by Lindblom *et al*. (2023),[21] a teach-back method was employed during patient

discharge to support self-care and medication adherence recommended for secondary prevention after stroke. The results indicated a positive effect on the understanding of medical information in patients with stroke, but no significant difference was observed in medication adherence between the two groups. This finding contrasts with the results of the present study, which may be attributed to the fact that the training in the previous study was provided in only one session and focused on a single topic, which might not have been sufficient to promote medication adherence. In contrast, the present study implemented a more comprehensive training program over a longer period of time. Akbari Zargar *et al*. (2020)[22] conducted a study comparing the effectiveness of acceptance- and commitment-based therapy and emotion-oriented cognitive therapy on health anxiety in patients with cardiac arrhythmia. The results indicated that both interventions effectively reduced health anxiety in these patients. Similarly, Aghakhani *et al*. (2017)[14] investigated the impact of an educational-supportive self-care package on anxiety, depression, and stress in patients with myocardial infarction. The study found that the intervention significantly reduced anxiety and depression scores in the intervention group but did not have a significant effect on stress levels. Although the interventions in these studies differ from the present study, the results suggest that educational interventions can effectively reduce anxiety in cardiac patients. This can be attributed to the improvement in patient quality of life, continuity of care, reduced anxiety, decreased risk of complications, increased participation in care programs, enhanced independence in daily activities, and reduced costs.[1,20] Effective patient education requires the use of verified training methods, and one promising and successful evidence-based approach is the teach-back method.

The teach-back method involves the trainer explaining the content in simple and understandable language, avoiding medical jargon. After the training, the client is asked to repeat the information in their own words to ensure comprehension. If the client does not fully understand, the trainer repeats the content until clarity is achieved.[17,23] Self-care training using the teach-back method focuses on teaching clients how to perform self-care measures, follow care regimens, acquire self-care skills, prevent diseases, improve health, and reduce anxiety.[24] This method differs from others in that it emphasizes asking the patient to express their understanding, leading to better comprehension of educational materials and their application. It also promotes adherence to treatment and medication, improves disease outcomes, and subsequently reduces health anxiety in patients. In essence, the teach-back method plays a crucial role in the self-care of patients with coronary artery disorders, enhancing their understanding of their own condition. Therefore, self-care training using this method can improve patients' comprehension of their illness, leading to better adherence to diet and medication regimens.[1,10] Consequently, this increases patients' awareness and reduces health anxiety and worry associated with uncertainties about their condition.

Limitation and recommendation

The study had several limitations that should be acknowledged. First, the spread of the coronavirus disease during the research period posed a challenge as patients were reluctant to attend face-to-face training sessions due to the fear of contracting the virus. As a result, alternative training methods were employed to ensure that all necessary information was provided to the participants. Second, there was a possibility that participants accessed information from other sources such as companions and media, which could have influenced the results in both the control and intervention groups. However, efforts were made to minimize this limitation. Among the limitations of this study was the one-centered setting of the study, which limited the generalizability of the results. Therefore, it is recommended that a similar study be performed with a larger sample size in several medical centers.

Conclusion

Based on the results obtained, it can be concluded that self-care training using a teach-back method had a significant impact on reducing health anxiety in patients with CADs. Therefore, it is recommended to incorporate the teach-back approach, which promotes interactive learning and a better understanding of the content and its application, alongside other educational methods by the nursing team to effectively reduce health anxiety in patients with CADs.

Conflicts of interest
There are no conflicts of interest.

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