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The Effect of Continuous Care Model on Self-Efficacy, Quality of Life and Treatment Regimen of Patients Undergoing Coronary Artery Bypass Graft

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ABSTRACT

BACKGROUND AND OBJECTIVE: Cardiovascular disease is the leading cause of a large percentage of deaths worldwide. With the improvement in the survival of coronary artery disease patients in recent decades, continuous self-care programs (based on education and prevention) are increasingly recommended. The aim of this study was to evaluate the effect of continuous care model on quality of life, self-efficacy and adherence to the treatment regimen of patients undergoing coronary artery bypass graft.

METHODS: This quasi-experimental study was performed with a single group before and after the intervention among 85 patients undergoing coronary artery bypass grafting in Tehran Social Security hospitals in 2016. Data were collected based on demographic questionnaires, McNew quality of life (lowest score 27 and highest score 189), general self-efficacy (lowest score 10 and highest score 40), and researcher-made regimen questionnaire (3 areas of diet, medication, and physical activity), (score of each domain 0-100%, undesirable adherence: less than 50% of the total score, desirable adherence: more than 75% of the total score). The intervention was based on the continuous care model (orientation, sensitization, control, evaluation). Training sessions were held for 4 weeks (stages 1 and 2) while control and evaluation were performed during 8 weeks after that. Questionnaires were completed and analyzed by patients before and 3 months after the intervention.

FINDINGS: The results showed that the scores of quality of life, self-efficacy and treatment regimen of patients before the intervention were 72.08±3.55, 25.08±2.48 and 180.18±9.61, respectively, and after the intervention were 85.13±0.63, 38.76±1.11, and 287.94±2.36, respectively. There was a statistically significant difference between the mean score of self-efficacy, quality of life and treatment regimen before and after the intervention ($p<0.001$).

CONCLUSION: According to the results of this study, the continuous care model has a positive effect on increasing the quality of life, self-efficacy and treatment regimen of patients.

KEY WORDS: *Continuous Care Model, Quality of Life, Self-Efficacy, Treatment Regimen, Coronary Artery Bypass Graft.*

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Introduction

Coronary heart disease is a serious and growing disease. In 2013, the disease was recognized as the leading cause of death in the world, which was accountable for the death of more than 17.3 million patients, and it is predicted that with the rapid growth of this disease by 2030, the mortality rate will reach 23.6 million people (1). In Iran, according to the World Health Organization, the first cause of death is cardiovascular disease, which includes more than 45% of all deaths due to coronary artery disease (2).

Many patients need non-pharmacological methods such as coronary artery bypass graft (CABG) to treat the problems caused by this disease (3). With the increasing number of this surgery in the community, the importance of postoperative complications and quality of life in these patients has been considered more than before (4). Quality of life is the result of feeling comfortable or good perceptions (5). A study by Pournaghas showed low quality of life in patients after coronary artery bypass graft (6). On the other hand, self-efficacy is also a factor affecting the quality of life (7). Improving self-efficacy leads to better self-management outcomes and adherence to treatment regimens and achieving therapeutic goals (8).

Research has confirmed a significant relationship between quality of life and self-efficacy of patients undergoing coronary artery bypass graft (9). In addition, one of the key goals in patient care is to increase adherence to the treatment regimen after heart surgery (10). According to studies, a healthy lifestyle and diet can prevent cardiovascular disease by up to 80%. Among lifestyle patterns, nutrition plays an important role in reducing cardiovascular disease (11).

Nowadays, the length of hospitalization of patients after heart surgery is shortened and their recovery period is spent more at home (12). Self-care education and continuous follow-up of chronic patients leads to independent management of affairs and accelerates their recovery process (4, 13). That's because most patients have little information about the disease, the treatment process and the consequences associated with their disease, while people with chronic disorders need self-care. Self-care training will prevent frequent hospitalizations, reduce frustration, and increase patients' self-confidence. Training may also improve patients' health and quality of life. In addition to education, follow-up with the aim of establishing a continuous care relationship is essential (14). The relatively low quality of life and attention to the chronicity of the disease and the need to continue to pay attention to their problems, make it necessary to use a model appropriate to the situation of these patients (4). Based on evaluations, there has been no study with a continuous program to improve the quality of life, self-efficacy and treatment regimen of these patients (15).

In Iran, a model called continuous care was designed by Ahmadi for chronic coronary heart disease (16), which includes four stages of orientation, sensitization, control and evaluation (17). The use of this model has had positive effects on indicators such as hospitalization frequency, physician visit, diet modification and quality of life of cardiovascular patients. In this model, the client (influential factor) acts in continuous care and the nurse (provider of care services) identifies the needs and problems and sensitizes the patient to accept the trained health behaviors. One of the features of this model is considering dynamic and continuous care communication according to the characteristics of patients undergoing coronary artery bypass graft. One of the most important needs after discharge of these patients is timely control and training to improve the quality of life and also to prevent postoperative complications, which indicates the need for a continuous care model (4).

The main purpose of this model is to design and formulate programs that can lead to the acceptance and increase of insight and appropriate practice for effective individual care that is effective in controlling problems, complications of disease and quality of life. According to research, the application of this model has been effective in emotional health and social communication (18), improving the quality of life of diabetic patients, chemical casualties with obstructive bronchiolitis, patients undergoing dialysis (19), and kidney transplantation (20) as well as self-care of heart failure patients, infertile women, maternal and child anxiety in pediatric surgery division (18). It has also reduced risk factors and improved the lifestyle of patients with myocardial infarction (19). Considering the emphasis on home care and education in the health system transformation plan (20) and the fact that in this area, the simultaneous effect of continuous care model on self-efficacy, quality of life and treatment regimen has not been addressed, the present study was conducted to determine the effect of continuous care model on quality of life, self-efficacy and adherence to the treatment regimen of patients undergoing coronary artery bypass graft in social security hospitals of Tehran province.

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Methods

This quasi-experimental intervention study was approved by the Ethics Committee of Islamic Azad University, Tehran Medical Branch with registration number IR.IAU.TMU.REC.1394.22 using a single group based on before-after design among patients undergoing coronary artery bypass grafting in Tehran Social Security hospitals (Milad and Shahid Lavasani Hospitals) in 2016. In order to determine the sample size with 95% confidence and 80% test power, the sample size was considered 85 people.

Random sampling was used here. Among the files of coronary artery bypass grafting candidates who referred to social security hospitals, after obtaining informed consent and ensuring the confidentiality of information of participants, the desired number of patients who met the research criteria were operated in the two hospitals by different surgeons. Then the questionnaires were completed by the patients before the intervention. Intervention was performed in the form of educational sessions with the presentation of an educational booklet to patients for 4 weeks and then follow-up care consultations (control and assessment) with referral to Sadr Center (a free center for rehabilitation, control and follow-up of patients of cardiac surgery in Social Security hospitals) within 8 weeks. Patients referred to this center 4 to 8 weeks after the surgery and at the same time as performing other therapeutic-clinical measures (echo, exercise test, visit to a cardiologist and nutritionist), the continuous care intervention continued in this center and finally 3 months after the intervention, the questionnaires were completed by the patient again and they were analyzed.

In cases of undergoing non-emergency coronary artery bypass graft for the first time, age under 65, having routine surgery without unexpected events in the operating room, using saphenous vein for transplantation, having the ability to understand Persian, ability to take care of oneself, educability, lack of addiction to drugs and alcohol, no history of known mental illness, living in areas where it is possible to make a phone call, the samples entered the study and in cases of instability in the medical condition, inability to continue cooperation and withdrawal, samples were excluded.

The instruments used in this study: were demographic characteristics questionnaire, MacNew Heart Disease Quality of Life Questionnaire (MNHD-Q), General Self-Efficacy (GSE) and a researcher-made questionnaire for treatment regimen.

Demographic information included: age, gender, marital status, occupation, level of education, income level, duration of illness, history of cardiac medication use, and frequency of hospitalization. The MacNew Heart Disease Quality of Life Questionnaire was developed specifically to assess the quality of life of cardiac patients and the validity and reliability of the Persian version for these patients were standardized and measured by Rajati et al. (21). Its reliability in the present study was calculated by Cronbach's alpha method to be 0.84. The questionnaire has 27 items in 3 subscales: performance (emotional, physical and social). Each question has 7-point criteria from "7" (always) to "1" (never); the highest score was 189 and the lowest score was 27. The validity and reliability of the General Self-Efficacy Questionnaire were measured by Rajabi in Iran (22). Its reliability in the present study was 0.75 by Cronbach's alpha method. The questionnaire consists of 10 questions with a Likert scale of 4; "strongly disagree" with a score of 1 and "strongly agree" with a score of 4. The highest score is 40 (most desirable score) and the lowest score is 10 (least desirable score). The researcher-made questionnaire of adherence to the treatment regimen also includes food, exercise, and medicine. To determine the face validity and content validity, the questionnaire was provided to a number of expert professors and their corrective opinions were applied. To determine the internal consistency, it was performed on a sample of 20 people and Cronbach's alpha was 0.75. In order to evaluate each part of the treatment regimen, scores (0 to 100) were assigned to each of the options: less than 50% of the total score showed undesirable adherence to the treatment regimen, 50 – 70% of the total score showed relatively desirable adherence, and higher than 75% of the total score showed desirable adherence.

Steps of implementing Continuous Care Model (CCM)

Orientation: A 30-40 minute session was held with the aim of familiarizing, motivating, feeling the need and how to communicate in person and by phone and emphasizing not to break the contact. The questionnaires were then completed by the patient (this session was conducted individually with the presence of the patient and the family).

Sensitization: The aim of this step was to involve the patient and family in the implementation of continuous care. Meetings were held in the form of lectures, group discussions and questions and answers. Then, individual

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counseling was performed after the sessions with the presence of the patient and family. Objective: Recognizing the nature and complications of the disease and involve the client and family with the problem according to the needs.

* Steps 1 and 2 were held in the first 4 weeks of the model in 4 sessions of 30 to 45 minutes according to the level of tolerance and patient admission. The researcher used referral to a specialist for problems that were beyond his or her job description.

Control: Objective: To continue and institutionalize health behaviors to promote health. Measures include indirectly reviewing and evaluating acquired skills, assessing new needs with respect to new problems, and reinforcing health behaviors. Provided weekly training and counseling by telephone and in person.

Evaluation: Objective: To examine the process of care and the effectiveness of the implementation of the model steps. The measures taken include evaluating the desired indicators, completing questionnaires and clinical and paraclinical findings, trying to institutionalize and perpetuate behaviors and control. Finally, the data of this study were analyzed using SPSS 21 software and descriptive (frequency, mean percentage and standard deviation) and inferential (paired t-test) statistical tests were performed, while $p<0.05$ was considered significant.

Results

The results of data analysis showed that the participants had a mean age of 57.8±8.12 years, a mean weight of 75.84±9.03 kg, mean height of 169.38±5.01 cm, a BMI of 27.51±2.98, and mean heart rate of 70.38±8.4. The mean scores of quality of life (emotional-physical-social) in general three months after the intervention (85.13±0.631), significantly improved compared to before the intervention (72.08±3.55) ($p<0.001$) (Table 1).

The mean scores of self-efficacy three months after the intervention (38.76±1.11) were significantly higher than before the intervention (25.08±2.48) ($p<0.001$). The treatment regimen generally improved significantly three months after the intervention (287.94±2.36) compared to before the intervention (180.18±9.61) ($p<0.001$) (Table 2).

Table 1. Comparison of mean scores of quality of life of patients undergoing coronary artery bypass grafting before and 3 months after continuous care model

Variable	Pretest			Posttest			Satistical test	Paired t-test
	Mean±SD	Min	Max	Mean±SD	Min	Max		P-value
Quality of Life	72.08±3.55	49	77	85.13±0.631	82	86	32.9	0.0001
Emotional dimension	31.88±2.31	21	36	37.79±0.433	36	38	22.72	0.0001
Physical dimension	26.81±1.57	19	30	31.52±0.376	30	32	27.32	0.0001
Social dimension	13.4±1.03	9	15	15.81±0.223	15	16	20.89	0.0001

Table 2. Comparison of mean scores of patients' treatment regimens before and 3 months after the implementation of the continuous care model

Variable	Pretest			Posttest			Satistical test	Paired t-test
	Mean±SD	Min	Max	Mean±SD	Min	Max		P-value
Diet dimension	107.61±5.98	95	124	168.59±1.39	164	172	91.89	0.0001
Motor dimension	45.6±4.16	37	58	73.14±0.94	71	75	59.12	0.0001
Medicine dimension	26.97±3.52	20	38	46.21±0.939	44	48	49.79	0.0001
Treatment regimen	180.18±9.61	158	219	287.94±2.36	282	294	107.75	0.0001

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Discussion

The results of this study showed that the implementation of a continuous care model on patients with coronary artery bypass grafting improves the mean scores of quality of life, self-efficacy and treatment regimen. The implementation of the continuous care model improves the quality of life in general and in three emotional, physical and social dimensions, which was consistent with the findings of Yalphani et al., according to which the patients' quality of life has improved in all three dimensions after the intervention (23).

In the study of Sahebalzamani et al., although the implementation of the continuous care model had no effect on the two quality of life indices of physical pain and social functioning, but could have a positive effect on knowledge and 6 quality of life indices of patients (14). The reason for the difference between this study and the present study may be the difference in the nature of the diseases.

In their study, Baghaie et al. concluded that the implementation of effective care models and education and follow-up in patients with heart failure improves the quality of life of patients (17), which was consistent with the present study. Studies have shown that there is a significant positive relationship between quality of life and self-efficacy, in a way that self-efficacy improves the quality of life in patients with coronary artery bypass grafting and also promotes self-management and treatment regimen in these patients (8, 24, 25). In this regard, the findings of this study showed that the mean scores of self-efficacy after the implementation of the continuous care model in patients significantly improved compared to before the intervention.

Naderipor et al. also concluded in their study that the mean self-efficacy scores of patients with coronary artery bypass grafting followed by self-management did not increase after the program (26), which could be due solely to educating patients and the lack of continuity in the program; this may be the reason for the difference with the present study. In a study of quality of life and self-efficacy in rehabilitation of patients over 70 years of age following myocardial infarction and coronary artery bypass graft surgery in the United States, McConnell et al. found that cardiac rehabilitation improved the self-efficacy of patients undergoing coronary artery bypass graft surgery (27). In a study comparing self-efficacy and resistance between diabetic and non-diabetic patients following coronary artery surgery in China, Lien et al. concluded that improving self-efficacy increases the positive outcome of rehabilitation, including greater depth of activity in patients after long-term coronary artery bypass graft surgery, and also increases acceptance of surgery in high-risk patients, such as patients with diabetes (28). Contrary to what was reported, the results of Parent et al.'s study showed that there was no statistically significant relationship between self-efficacy in the fourth week between the two intervention and control groups (29), which could be due to lack of continuity of training program, smaller sample size and only using male samples; this may be the reason for the difference with the present study.

The results of this study show that the implementation of the continuous care model improves the scores of the treatment regimen in patients undergoing coronary artery bypass grafting. This finding is consistent with the results of a study by Turpin et al., according to which providing education based on changing the patient's attitude toward the disease improves adherence to the treatment regimen in these patients (30). One of the strengths of the present study is the large sample size, the use of a specific questionnaire of quality of life of heart patients and simultaneous study of both sexes.

Limitations of the study included insufficient time as well as individual, social, cultural and economic differences that could affect patients' education, as well as mental and psychological states of the samples when answering the questionnaire. The results of this study showed that the implementation of a continuous care model in patients undergoing coronary artery bypass grafting improves self-efficacy, treatment regimen and quality of life. Using this model as a non-invasive and low-cost method can bring positive results. That’s because patients learned during the intervention that although coronary artery disease and consequent coronary artery bypass grafting could not be controlled, we can prevent other complications by recognizing the nature, side effects, and proper treatment and principles of self-care. As a result, self-efficacy and adherence to the treatment regimen and quality of life of these people were improved.

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