

The effects of discharge training and counseling on post-discharge problems in patients undergoing coronary artery bypass graft surgery

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ABSTRACT

Background: Advances in coronary artery surgery have reduced morbidity, mortality, and rates of graft occlusion. Discharge programs are important services for the continuity of treatment and must encompass physical, psychological, and social aspects of individual patient care. This study aimed at investigating the effect of planned discharge training and counseling on the problems experienced by patients undergoing coronary artery bypass graft (CABG) surgery.

Materials and Methods: A semi-experimental study was performed on 100 patients undergoing CABG surgery in the surgery department. During a period of 9 months from January to September 2013, the patients in the intervention group were provided with adequate discharge training and counseling with a booklet before surgery and counseling until 6 weeks after discharge, while the control group patients received only routine clinical procedures, i.e. prescribing medicine, controlling vital signs, and wound dressing. The data were analyzed using Statistical Package for the Social Sciences (SPSS) 23. Frequency and distribution were used to describe the data, and paired sample *t*-test, variance analysis, Fisher's exact test, and Chi-squared tests were also used.

Results: The reported problems for both groups had a descending pattern during the three follow-ups. However, this pattern had a greater slope in the intervention group compared to the control one. As a result of these education programs, problems were fewer in the intervention group than in the control group ($P < 0.05$).

Conclusions: Discharge training and counseling given to the intervention group had a positive impact on decreasing the problems that the patients had. Therefore, the institutions may be recommended to support multidisciplinary patient training and counseling activities using the methods described in this study.

Key words: Coronary artery bypass grafting, counseling, Iran, patient discharge

INTRODUCTION

Coronary artery disease (CAD), one of the most common causes of premature death, causes myocardial ischemia.^[1,2] As the older population of countries and unhealthy habits and behaviors increase, CAD contributed death toll increases. According to data from the World Health Organization (WHO) in 2008, 17.3 million people in the world die from cardiovascular diseases (CVDs) annually. Over 80% of the mortality caused by CVDs occurs in countries with low and middle income.^[3] Studies revealed that 5.18–20% of

Iranians suffer from hypertension and 69% lack sufficient physical activities which contributes to CVDs. Regarding obesity, studies show 43% of people over 15 years old are overweight. Every day, almost 2500 Americans die from CVDs, i.e. an average of one death every 35 s.^[4] Myocardial revascularization as the major and most common coronary artery bypass graft (CABG) surgery technique has been used in the treatment of CAD since 1960s.^[5] In 2011, over 300,000 patients underwent CABG, the most frequently performed surgery for coronary heart disease in the United States, for which the initial hospital cost approximated \$30,000 per patient.^[6]

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Although recent advances have increased the success rate of CABG surgeries, they do not eliminate all physical, psychological, and social problems faced by patients after discharge. The problems during the first month after discharge are related to the respiratory system, circulation, the operation area, drug use, nutrition, excretion, exercises, self-care, pain control, shoulder, back, chest, or leg pain, insomnia, nightmares, palpitation, weakness, tiredness, mood swings, depression, and loss of appetite.^[7,8] Direk and Çelik reported that the patients undergoing CABG surgeries faced fatigue, dyspnea, pain at the wound site, weakness, sleeplessness, loss of appetite, fear, pessimism, edema in the legs, wound dehiscence, palpitation, and constipation after discharge.^[9] Cebeci and Çelik also reported some physical and psychological problems like poor nutrition, decrease in appetite, nausea and vomiting, changes in bowel habits, sleep disturbances, fatigue, pain, anxiety, and depression within 6 months after discharge.^[10] About 20% of patients get depressed after a major cardiac event like CABG surgery. Having temporary feeling of sadness is normal for a patient, which should go away within a few weeks as the patient gets back to normal routines and activities.^[11] Problems related to pain management, exercise, and self-care, being helpless to solve the problems, looking for clinics, or being admitted to the hospital again are the problems reported by Dal *et al.*^[7]

Since discharge training and counseling services after CABG surgery reduce the problems experienced by patients and their families, namely, re-hospitalizations and health care costs, and as the related literature and our observations in Iran reveal that nursing care, training and consultancy services at the time of discharge are not effective or adequate and monitoring at home is not done appropriately and also due to the fact that there are limited studies about the problems faced by the patients in Iran, the researcher felt the necessity to conduct the present study. The results obtained from this study can provide guidance for discharge training, counseling and follow-up services, and further studies about this issue.

Postoperative nursing care, discharge planning including teaching and counseling, follow-up, and teaching and counseling by phone are the important services that can prevent unnecessary delays in discharge and ensure the availability of adequate support afterward. The discharge period is an opportunity to have a positive impact on patients' outcomes and should be a priority for the healthcare team.^[12-14] Patients undergoing CABG have to make considerable adjustments based on knowledge to adapt to the new life situation.^[15] The aim of this study was to investigate the effects of discharge training and counseling on post-discharge problems in patients undergoing CABG surgery.

MATERIALS AND METHODS

This semi-experimental study was conducted to investigate the effects of planned discharge training and counseling on post-discharge problems of the patients undergoing CABG surgeries. In the current study, the problems faced after surgery are considered as the dependent variable, while the intervention and the given training are taken as the independent variable. The study population consisted of patients who had undergone CABG surgeries. The sample of the study consisted of 100 male and female patients who had undergone CABG surgeries, and its calculation was done using the Number Cruncher Statistical System (NCSS)–Power Analysis and Sample Size (PASS) 2006 software. The participants were divided into two groups of intervention and control and they were assigned to these groups using accessible sampling method. Fifty were placed in the intervention group, while the remaining 50 were in the control group. Data collection tools and the discharge training booklet were tested for structure reliability and clarity in a pilot study conducted at Seyed-al-Shohada Hospital on 10 patients, 5 of whom were randomly assigned to the control group and the other five were in the intervention group. Data collection sheet was developed by the researcher considering the points recommended by the relevant literature, and its content and face validity were examined by four nursing experts from Turkey and six heart surgeons from Iran.

Study implementation

The present study was conducted for 9 months, from January to September 2013. It was carried out in the surgery department of Seyed-al-Shohada Cardiology Subspecialty Hospital affiliated with Urmia University of Medical Sciences in Urmia, Iran. The intervention group consisted of those patients who received both planned discharge training and counseling services during the time of their hospitalization and were provided home visit or given counseling by phone after discharge, while the control group patients had routine nursing care that included administering medicines and measuring the vital signs, with no planned training services. Discharge training and counseling services were provided according to patients' individual needs and through a training booklet which was developed for this purpose. Knowing about the multiple system changes caused by surgery will help patients and the rest of the care team anticipate postoperative problems and intervene quickly and appropriately so that the patient can have the best possible outcome.^[16]

In the present study, in order to avoid the samples' influence on each other, the research started with the control sample. After sampling the control group, the intervention group

was sampled. Patients in the intervention group were given discharge training by the researcher according to the “discharge training booklet.”

Statistical analysis

The data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 23.0. Frequency and percentage were used to describe the data; Fisher's exact test and Chi-squared test were used for analyzing the data. For examining the equality of variance and checking whether the population of the study is homogenous or not, and also to check if the population has got the required eligibility for applying the Chi-square test, Levene's test was applied in advance.

Dependent variables of the study included post-discharge problems, while the independent variables were age, sex, profession, job status, marital status, place of residence, the people who live with the patient, educational level, health insurance, income status, number of the people in the family, caregivers of the patient, CAD process, existence of coronary heart disease in the family, history of CABG surgery in the family, the presence of additional diseases, CABG factors, New York Heart Association (NYHA) class, number of replaced vessels, cross-clamp time, duration of surgery, and length of hospital stay.

Permission for the study was granted by the Hacettepe University Ethics Committee. The necessary written approval was obtained from the administration department of the hospital prior to this study. Patients were informed about the study and their written informed consents were obtained.

RESULTS

According to the findings, the majority of patients were urban residents and males in the intervention and control groups. Considering other demographics, it was revealed that most participants in both groups were married. Comparing the two groups based on education level, it was observed that the highest levels of received education were primary school and literacy in the intervention group and literacy in the control group. Statistical analyses showed that the control and intervention groups did not differ significantly in terms of descriptive characteristics. However, they were found to differ significantly in terms of job status and chronic illness patients' risk factors ($P < 0.05$). Comparing the average body mass index (BMI), it was revealed that all participants were overweight, with a higher rate in the intervention group, and the control group had a higher age average (61.06) compared to the intervention group (58.82), but there was no significant difference between the two groups ($P > 0.05$) [Table 1].

Table 2 shows the frequency and percentage of problems in both groups. Most of the problems (>50%) were reported in the control group, namely, respiratory problems, loss of

Table 1: Characteristics, habits, and health status of control and intervention group patients

Characteristics	Control group (n=50)		Intervention group (n=50)		Statistical evaluation ^a
	F	%	F	%	
Living in					
City	40	80.0	33	66.0	$\chi^2=2.48$ $P=0.08$
Village	10	20.0	17	34.0	
Gender					
Male	40	80.0	38	76.0	$\chi^2=0.23$ $P=0.62$
Female	10	20.0	12	24.0	
Marital status					
Married	46	92.0	49	98.0	Fisher $P=0.16$
Divorced	4	2.0	1	2.0	
Education					
Literacy	21	42.0	16	32.0	$\chi^2=8.0$ $P=0.09$
Primary	9	18.0	16	32.0	
Elementary	5	10.0	10	20.0	
High school and above	15	30.0	8	16.0	
Job status					
Employed	36	72.0	27	54.0	Fisher $P=0.03$
Unemployed	14	28.0	23	46.0	
Income status					
< Expenses	8	16.0	7	14.0	$\chi^2=1.10$ $P=0.57$
> Expenses	15	30.0	11	22.0	
Balance	27	54.0	32	64.0	
Life status					
Alone	1	2.0	5	10.0	Fisher $P=0.09$
Not alone ^b	49	98.0	45	90.0	
Health status and habits					
Smoking	20	40.0	22	44.0	$\chi^2=0.16$ $P=0.68$
Alcohol abuse	2	4.0	1	2.0	$\chi^2=0.34$ $P=0.55$
Had chronic illness ^c	11	22.0	21	42.0	$\chi^2=4.59$ $P=0.03$
Had CAD in family	13	26.0	17	34.0	$\chi^2=0.76$ $P=0.38$
Had CABG surgery in family	6	12.0	8	16.0	$\chi^2=0.33$ $P=0.56$
Previously had surgery ^d	19	38.0	22	44.0	$\chi^2=0.37$ $P=0.54$
Body mass index	26.75 26.94 (3.74)		27.12 (4.19) ^e		$t=0.49$, $P=0.16$
Age	61.06 59.94 (9.28)		58.82 (9.26) ^e		$t=0.23$, $P=0.65$

^aThe significance level of $P < 0.05$ was accepted, ^bwith spouse, spouse and my child/children, my child/children, brother; ^cChronic illness included hypertension, diabetes mellitus, asthma, dyspnea, arthritis; ^dpreviously had surgeries that included head and neck surgery, hands and feet surgery, gynecological surgery, eye surgery; ^eMean (SD)

Table 2: The problems experienced by control and intervention group patients after discharge

Problems ^a	Control group (n=50)		Intervention group (n=50)		Statistical evaluation ^b (P)
	F ⁽¹⁾	%	F ⁽¹⁾	%	
Respiratory system					
Respiratory difficulty	27	54.0	15	30.0	0.01
Cardiovascular system					
Blood pressure	10	20.0	3	6.0	0.03
Palpitation	20	40.0	7	14.0	0.00
Gastrointestinal system					
Loss of appetite	29	58.0	23	46.0	0.23
Nausea	2	4.0	3	6.0	0.64
Vomiting	0	0	1	2.0	0.31
Constipation	17	34.0	11	22.0	0.18
Diarrhea	2	4.0	3	6.0	0.64
Wound healing					
Wound edema					
Leg	26	52.0	12	24.0	0.00
Chest	6	12.0	1	2.0	0.05
Leg and chest	14	28.0	1	2.0	0.00
Wound pain					
Leg	13	26.0	7	14.0	0.13
Chest	11	22.0	1	2.0	0.13
Leg and chest	19	38.0	1	2.0	0.00
Wound drainage					
Leg	5	10.0	5	10.0	1.00
Chest	3	6.0	3	6.0	1.00
Leg and chest	1	2.0	0	0.0	0.31
Wound redness					
Leg	11	22.0	3	6.0	0.02
Chest	3	6.0	4	8.0	0.69
Leg and chest	16	32.0	1	2.0	0.00
Problems in social life					
Refusal to see visitors	15	30.0	4	8.0	0.00
Unwillingness to social contacts	20	40.0	6	12.0	0.00
Neurological problems					
Dizziness	13	26.0	9	18.0	0.33
Fatigue	33	66.0	21	42.0	0.01
Psychological problems					
Pessimism	4	8.0	5	10.0	0.72
Attention deficit problem	21	42.0	3	6.0	0.00
Weakness	27	54.0	14	28.0	0.00
Introversion	28	56.0	10	20.0	0.00
Fear	9	18.0	3	6.0	0.06
Sleep problems					
Insomnia	36	72.0	8	16.0	0.00

Contd....

Table 2: Contd...

Pain					
Chest pain	40	80.0	34	68.0	0.17
Back pain	34	68.0	23	46.0	0.02
Shoulder pain	36	72.0	16	32.0	0.00
Other problems ^c	49	98.0	10	20.0	0.00

^aIf the patient experienced problem once after discharge, it is considered as a "problem"; ^bthe significance level of $P < 0.05$ was accepted; ^cother problems included fever, abdominal distention, headache, numbness, more sputum, cold feet, throat, chill swathing, sensitivity to odors, sexuality

appetite, fatigue, weakness, introversion, difficulty in falling asleep, insomnia, chest pain, back pain, and shoulder pain; in the intervention group, only chest pain (>50%) was found. In the problems like respiratory difficulty, blood pressure, palpitation, wound edema in leg, chest, or both, wound pain in leg and chest, wound redness in leg and chest, refusal to see visitors, unwillingness to make social contacts, fatigue, attention deficit problem, weakness, introversion, difficulty in falling asleep, insomnia, back pain, shoulder pain, and other problems (abdominal distention, headache, numbness, more sputum, cold feet, throat, chill swathing, sensitivity to odors, sexuality), statistically significant differences were found between the control and intervention groups ($P < 0.05$).

The extent of the reported problems in all cases was higher in the control group than in the intervention group. At the first follow-up, more than 10% of the reported problems by the patients in intervention group consisted of chest, back, and shoulder pain, difficulty in falling asleep, introversion, weakness, fatigue, respiratory difficulty, wound edema and wound pain in leg, constipation, loss of appetite, and respiratory difficulties. All these problems were resolved at the second follow-up, except for two cases of respiratory difficulties and one case of wound edema in leg and constipation, which remained until the third follow-up. The third follow-up showed that of the reported problems in the control group, only nausea, vomiting, diarrhea, and wound drainage in legs and chest, which accounted for 12% of the problems, were resolved and 88% were unsolved, whereas a steep slope of solving problems was observed in the intervention group. The observations showed that in the intervention group, only 11.4% of the problems were unsolved at the third follow-up [Table 3].

DISCUSSION

The findings showed that most of the patients in the intervention and control groups were urban residents, males, and overweight. Considering other demographics,

Table 3: The problems experienced by control and intervention group patients during follow-ups

Problems*	Follow-up 1 (n=50)				Follow-up 2 (n=50)				Follow-up 3 (n=50)			
	Control group		Intervention group		Control group		Intervention group		Control group		Intervention group	
	F	%	F	%	F	%	F	%	F	%	F	%
Respiratory system												
Respiratory difficulty	23	46.0	11	22.0	24	48.0	2	4.0	16	32.0	2	4.0
Cardiovascular system												
Blood pressure problem	9	18.0	1	2.0	9	18.0	2	4.0	8	16.0	-	0.0
Palpitation	15	30.0	5	10.0	14	28.0	1	2.0	13	26.0	2	4.0
Gastrointestinal system												
Loss of appetite	27	54.0	19	38.0	30	60.0	4	8.0	17	34.0	-	0.0
Nausea	2	4.0	2	4.0	2	4.0	-	0.0	-	0.0	-	0.0
Vomiting	1	2.0	-	0.0	1	2.0	-	0.0	-	0.0	-	0.0
Constipation	16	32.0	8	16.0	18	36.0	1	2.0	12	24.0	1	2.0
Diarrhea	1	2.0	2	4.0	2	4.0	2	4.0	-	0.0	-	0.0
Wound healing												
Wound edema												
Leg	21	42.0	9	18.0	21	42.0	3	6.0	19	38.0	1	2.0
Chest	5	10.0	-	0.0	5	10.0	-	0.0	2	4.0	-	0.0
Leg and chest	13	26.0	-	0.0	11	22.0	-	0.0	8	16.0	-	0.0
Wound pain												
Leg	6	18.0	6	12.0	5	10.0	1	2.0	8	16.0	-	0.0
Chest	7	14.0	-	0.0	10	20.0	-	0.0	6	12.0	-	0.0
Leg and chest	19	38.0	-	0.0	13	26.0	-	0.0	8	16.0	-	0.0
Wound drainage												
Leg	5	10.0	4	8.0	4	8.0	3	6.0	3	6.0	-	0.0
Chest	4	8.0	1	2.0	5	10.0	-	0.0	4	8.0	-	0.0
Leg and chest	1	2.0	-	0.0	1	2.0	-	0.0	-	0.0	-	0.0
Wound redness												
Leg	7	14.0	3	6.0	8	16.0	1	2.0	4	8.0	-	0.0
Chest	3	6.0	1	2.0	4	8.0	1	2.0	1	2.0	-	0.0
Leg and chest	16	32.0	-	0.0	7	14.0	-	0.0	1	2.0	-	0.0
Problems in social life												
Refusal to see visitors	10	20.0	4	8.0	12	24.0	1	2.0	9	18.0	-	0.0
Unwillingness to make social contacts	17	34.0	5	10.0	18	36.0	2	4.0	9	18.0	-	0.0
Neurological problems												
Dizziness	10	20.0	5	10.0	8	16.0	-	0.0	9	18.0	3	6.0
Fatigue	34	68.0	20	40.0	27	54.0	10	20.0	23	46.0	-	0.0
Psychological problems												
Pessimism	4	8.0	3	6.0	4	8.0	3	6.0	2	4.0	1	2.0
Attention deficit problem	17	34.0	2	4.0	20	40.0	-	0.0	14	28.0	-	0.0
Weakness	26	52.0	10	20.0	24	48.0	7	14.0	19	38.0	-	0.0
Introversion	25	50.0	9	18.0	25	50.0	3	6.0	18	36.0	-	0.0
Fear	7	14.0	3	6.0	6	12.0	1	2.0	5	10.0	-	0.0
Sleep problems												
Difficulty in falling asleep	37	74.0	11	22.0	35	70.0	1	2.0	30	60.0	-	0.0
Insomnia	38	76.0	5	10.0	35	70.0	-	0.0	29	58.0	-	0.0

Contd...

Table 3: Contd...

Problems*	Follow-up 1 (n=50)				Follow-up 2 (n=50)				Follow-up 3 (n=50)			
	Control group		Intervention group		Control group		Intervention group		Control group		Intervention group	
	F	%	F	%	F	%	F	%	F	%	F	%
Pain												
Chest pain	37	74.0	29	58.0	42	84.0	12	24.0	40	80.0	-	0.0
Back pain	31	62.0	21	42.0	31	62.0	4	8.0	25	50.0	-	0.0
Shoulder pain	33	66.0	13	26.0	34	68.0	5	10.0	24	48.0	-	0.0

*As the above tables reveal, the extent of the reported problems in all cases

we noticed that most of the participants in both groups were married. One of the reasons for a long-term survival after CABG is being married, especially having a highly satisfying marriage.^[17] It was also found that married patients who live with their spouse and children had higher self-care ability scores ($P < 0.05$).^[9,17] In addition, nearly all participants in both groups were living with their families, but there was a higher percentage in the intervention group. Living with their families caused the families of patients who have undergone coronary artery bypass surgery to understand the demands better and this understanding can have a positive effect on the healing process.^[6]

On comparing the two groups based on job status, the control and intervention groups showed a significant difference ($P < 0.05$). Researches have shown an increase in coronary heart disease resulting from job stress. Work characteristics were simultaneously adjusted and controlled for employment grade level, negative affectivity, and coronary risk factors.^[18,19] Comparing the average BMI revealed that all participants were overweight, with a higher rate in the intervention group, but there was no significant difference between the two groups ($P > 0.05$). CAD risk factors such as obesity, stress, urban life, sedentary lifestyle, and gender have also been found to be important factors affecting the recovery symptoms of CABG patients.^[20] Perrotta *et al.*,^[21] Wagner *et al.*,^[22] and Bagheri *et al.*,^[23] in their study results, suggested that BMI is an independent predictor of post-CABG complications and longer hospitalization, but is not associated with an increased, early, or long-term mortality. CAD risk factors were found to be similar in the patients of intervention and control groups. In the studies conducted by Cebeci and Celik^[10] and Naylor *et al.*,^[24] CAD risk factors were found to be similar ($P > 0.05$). The present findings indicate that initiating a smoking cessation program should not be deferred until after surgery. Saxena *et al.* found that patients who continued to smoke after CABG had a greater risk of death than the patients who stopped smoking.^[25] Al-Sarraf *et al.* also found that smoking cessation before CABG reduced the risk of serious pulmonary complications.^[26] Comparing the patients based on their health status revealed that most cases of chronic diseases

were among patients in the intervention group than among patients in the control group and a significant difference was observed ($P < 0.05$). Patients who had chronic illness, such as diabetes mellitus, chronic pulmonary disease, heart dysfunction, and those with chronic kidney disease were more likely to have complications. It is worthy to mention that factors which play a role in the development of CVD in patients indicate that they carry risks.^[9]

In this study, all patients experienced at least one problem after discharge. In the control group, problems reported by more than 50% of the patients were difficulty in falling asleep, insomnia, shoulder pain (72%), back pain (68%), fatigue (66%), loss of appetite (58%), introversion (56%), weakness, respiratory problems (54%), and wound edema in leg (52%). The least reported problems by patients in the control group were wound drainage in leg and chest (2%), and the least reported problems by patients in the intervention group were vomiting, wound healing, wound redness, and wound pain in the leg and chest (1%). Regarding the problems experienced by the control and intervention group patients during follow-ups after discharge, such as problems in the respiratory system, cardiovascular system, wound edema, wound pain, wound redness in the leg and chest, problems in social life, fatigue of neurological problems, psychological problems in attention deficit, weakness, introversion, all problems in social life, back and shoulder pain, and other problems, significant differences were observed ($P < 0.05$).

As a result of training, counseling, and giving information to patients during follow-up, in-house consultation, and the initiatives implemented and applied in the intervention group, respectively, from the first to the third consultative advice, the number of patients whose problems were solved was sequentially 7, 12, and 28 in the intervention group and 4, 0, and 4 in the control group. In the present study, discharge education programs with an interdisciplinary perspective, between patient, family, and researcher, along with consultancy services in conjunction with home care and follow-up, were implemented with an improvement in quality to reduce and eliminate the problems that the

patients faced. Reasons of poor education given by hospital nurses, no follow-up, and problems observed in the control group were greater in the intervention group, such that statistically significant differences were found ($P < 0.05$). When the results of follow-ups were compared in the control and intervention groups, it was found that the control group had more problems after discharge than the intervention group in all three follow-ups. The reported problems for both groups had a descending pattern during the three follow-ups. However, this pattern had a greater slope in the intervention group. As a result of this education and counseling service, patients' problems were fewer in the intervention group than in the control group ($P < 0.05$). The findings of the current study are in complete agreement with the studies done by Direk and Çelik^[9] and Tuna and Çelik.^[27] Hassani *et al.*, in their research, found that more than 56% of patients were suffering neurological problems after coronary artery bypass surgery.^[28] The researcher gave all the required education to the intervention group patients according to the booklet developed by the researcher. In addition, the researcher tried to solve patients' problems by creating the possibility of 24-h connection to patients, emphasizing education given in the booklet with the aim of solving problems by timely advice and follow-up. The observed differences between problems experienced by the control and intervention groups could be due to the education and counseling given to the patients in the intervention group before surgery and at follow-ups after discharge. However, in the control group, most of the problems that the patients faced were unsolved until the third follow-up. The present study implemented discharge education programs with an interdisciplinary perspective, between patient, family, and researcher, along with consultancy services in conjunction with home care and follow-up to improve the quality in order to reduce and eliminate the problems that the patients face. The factors such as poor education given by hospital nurses, no follow-up in the control group, and problems observed in the control group were greater in the intervention group, as statistically significant differences were found between the groups.

CONCLUSIONS

It has been proved that cardiovascular surgery education improves patients' post-discharge outcomes. Since the self-management skills are rarely innate, patients and their families require education to acquire the knowledge and skill to manage their post cardiovascular surgery home care.^[29] In particular, there is an ample amount of evidence showing that a nurse-led discharge training is closely associated with a high reduction rate of post-discharge problems and re-admissions to hospital. Furthermore, the intervention of therapeutic lifestyle change in a nursing program modified the

cardiac risk factors effectively and improved the prognosis. The advantages of nursing support for cardiac rehabilitation patients can improve the health outcomes and reduce the risk of a new cardiac event. It is of utmost importance for nurses to meet the rehabilitative care needs of patients through education, support, supervision, and reinforcement.^[30,31]

Finally, the impact of training and counseling before and after surgery in patients who have undergone coronary artery bypass surgery is established in this study. Regarding the postoperative problems and using interventions for solving them by patients and their families, giving information to patients during follow-up, in-house consultation, and implementing initiatives are recommended.

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