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Original Article

Effectiveness of a Health Education Program on Coronary Artery Bypass Graft Patients' Knowledge in Surgical Specialty Hospital-Cardiac Center in Erbil City

Dlzar Omer Qadir; *Department of Nursing, College of Nursing, Hawler Medical University, Erbil, Kurdistan Region, Iraq.*
(Correspondence: dlzar.qadir@hmu.edu.krd)
Yousif Mohammed Younis; *Department of Nursing, College of Nursing, Hawler Medical University, Erbil, Kurdistan Region, Iraq.*

ABSTRACT

Background and objective: Coronary Artery Bypass Graft is considered an important surgical procedure and due to the lack of sufficient knowledge in CABG patients, it is necessary and vital to carry out interventions to improve the knowledge of patients. Therefore, the purpose of this study is to determine the effect of a health education program on patients' knowledge.

Methods: This study is a quasi-experimental conducted between 2021 and 2023. The population of the study sample consisted of patients who were admitted to the cardiac center hospital in Erbil city. The samples were divided into two groups by random allocation, each group of 100 people. Data collection was based on a researcher-made questionnaire including three socio-demographic, medical data of patients with CABG and knowledge related to CABG. The intervention consisted of 6 sessions, which included 2 sessions of general training for patients, and 4 sessions of training including physiological aspects, self-concept, reciprocal relations and the fulfillment of obligations.

Results: The mean age in the control group is 56.63±9.74 and in the intervention group is 54.32±11.123. After the intervention, the mean knowledge score in the General Information, Risk Factor, Complication, Diagnosis, and Management of Coronary Artery Bypass Grafting sections showed a significant increase among patients in the intervention group compared to the control group (P≤0.001). The results showed that the mean overall awareness score in the intervention group at the beginning of the study is lower than the average awareness score after the intervention, and this mean difference is significant (P≤0.001). The mean overall knowledge score in the intervention group has a significant difference compared to the control group (0.001).

Conclusion: Considering the important effects of the educational program on increasing knowledge about various aspects of coronary artery bypass graft, educational programs should be given more attention.

Keywords: Coronary Artery Bypass Graft; Education Program; Risk Factor; Co-morbidity; Diagnosis; Management.

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INTRODUCTION

Cardiovascular disease (CVD), sometimes known as heart disease [1]. Coronary artery disease is the greatest cause of mortality in the world. According to the World Health Organization (WHO), ischemic heart disease caused roughly nine million deaths in 2016 [2]. The onset of coronary artery disease is often linked to a chronic inflammatory process, beginning with the creation of a fatty streak and progressing to the formation of a fibrous atheroma [3]. This situation results in a mismatch between myocardial oxygen supply and demand [4]. Cardiovascular disease clinical manifestations might range from asymptomatic to classic. [5].Coronary Artery Bypass Grafting (CABG) is an important surgical procedure in which athermanous blockages in a patient's coronary arteries are bypassed with venous or arterial conduits. Bypass blood flow restores the function and viability of the ischemic myocardium, and relieves the symptoms of angina. Approximately 400,000 CABG procedures are performed annually, making it the most common major surgery [6]. Although CABG improves overall long-term mortality in individuals who meet the criteria for CABG, there is an initial operative mortality risk after CABG. The rates reported in the FREEDOM and SYNTAX trials, 1.7 percent and 3.5 percent, respectively, are consistent with conventional mortalities [7, 8]. Despite the advantages of CABG surgery, it also has some complications, the most important of which include the following [9]. Sternal wound, SVG failure, postoperative renal failure, stroke, and atrial fibrillation. Diet, exercise and lifestyle modifications have been shown to play a potentially significant role in improving post-CABG outcomes in the few studies conducted [10] .Post-CABG discharge education and counseling ease recovery issues, lower rehospitalization rates, and medical expenses enhance patient satisfaction and quality of life (QOL), promote functional independence, and allow patients to do self-care tasks and take care of their own requirements [11, 12]. Kalogianni et al., [13] discovered that preoperative education provided by nurses decreased postoperative problems of patients undergoing heart surgery, but it was ineffective in lowering readmissions or duration of stay.It seems that due to the high prevalence of cardiovascular diseases and the lack of sufficient knowledge and awareness in coronary artery bypass graft patients, it is necessary and vital to carry out interventions to improve the awareness of patients. Therefore, the purpose of this study is to determine the effect of a health education program on the CABG patient's knowledge in a cardiac center in Erbil city.

METHODS

The study employed a quantitative quasi-experimental design with a pre-test and post-test approach to examine the impact of a training program on patients admitted to the coronary care unit of a cardiac center hospital in Erbil City between 2021 and 2023. The samples were divided into two groups by random allocation. To enhance comparability between the intervention and control groups, several matching criteria were considered, including age, gender, socioeconomic status, and the severity of illness. Through random allocation, 100 patients were assigned to the intervention group, where they received the training program, while another 100 patients were assigned to the control group, where they did not receive the intervention. By incorporating these matching criteria, the study aimed to minimize potential confounding variables and strengthen the internal validity of the findings. Sample size according to the studies by P Sharma et al., [14] and K Zia et

al., [15] was determined. The prevalence of CABG surgery in previous studies was 70%. Accordingly, due to the same prevalence of the disease in both groups, a sample size of 81 patients was considered for each group. The calculated sample was 81 patients, which was considered to increase the strength and external validity of the study and the availability of samples for each group of 100 patients. The inclusion criteria of the study were: age above 30, ability to participate in the study, lack of prior training experience, individuals' personal interest in participating in the study, an adult patient who performs CABG, and patients with stable conditions. Exclusion criteria of the study were: patients who refuse to complete the post-test, patients with mental retardation, and mental illnesses, patients with sensory problems such as blindness and deafness, patients with Alzheimer's people who changed their opinion about participating in the study or missed two consecutive educational intervention sessions for any reason. After several literature reviews and previous studies, the investigator constructed the questionnaire and applied it before the application of the actual educational program. It consists of three parts, which are sociodemographic, medical data of patients with CABG and knowledge related to CABG. All patients with coronary artery bypass grafts in Erbil cardiac center hospital who had the conditions to participate in the study were included in the study after completing the consent form. The researcher explained the demographic characteristics questionnaire and the quality of life questionnaire to the patients, and the questionnaires were face-to-face (interview) individually for about 20-30 minutes with each patient in two sessions of the educational program before and after The test was completed using a questionnaire format. The questionnaire was distributed anonymously and coded. After completing the questionnaires, the samples were randomly assigned to two intervention and control groups by means of random allocation software. The samples were divided into two groups. 100 patients were exposed to the training program as the study group, and another 100 patients were not exposed to the training program as the control group. Then, before implementing a real training program, the researcher used a questionnaire consisting of three parts, which include demographic-social data, medical data of CABG patients and knowledge related to CABG. The intervention of the upcoming research consisted of 6 sessions, which included 2 sessions of general education of patients, 4 sessions on physiological dimensions, self-concept, mutual relations and role playing, and these 4 sessions were direct interventions by the researcher in the format. By actively addressing the main and underlying factors contributing to incompatible behaviors identified in the needs assessment form, the researcher played a crucial role in helping every patient within the intervention groups meet their individual needs. This was achieved through the researcher's physical presence at the hospital and department, ensuring personalized support and intervention for each participant.

Ethical approval was achieved from the Ethics Committee of the College of Nursing/ Hawler Medical University as a code number is 145 in 7/10/2021. Permission was obtained from the Director of Health/Erbil. Data analysis was reported with the assumption of normality using central indicators of mean (standard deviation) and frequency (percentage) for quantitative variables. (Chi-square) test was used to check the statistically significant relationship between quantitative variables. A T-test and a paired-T test were used to evaluate the effect of training

in two groups. Data were analyzed using SPSS V. 23 software. A significance level of P ≤ 0.05 was considered.

RESULT

Table 1 shows that the mean age of the two groups of people under investigation participants showed that the mean age in the control group is 56.63±9.7455.14±6.47 years and in the intervention group is 54.32±11.12353.21±5.41 years. The age group of patients showed that (7%) patients in the intervention group and (12%) patients in the control group were in the age group of 30-39 years. (22%) patients in the intervention group and (24%) patients in the control group were in the age group of 40-49 years old. (33%) patients in the intervention group and (31%) patients in the control group were in the age group 50 -59. (27%) patients in the intervention group and (24%) in the control group were in the age group of 60-69 years, and the two groups did not differ in terms of age groups. The gender description of the patients in the two groups showed that (57%) patients in the intervention group and (59%) patients in the control group were male, and the two groups had no significant differences in terms of gender distribution. The level of education of patients in the two groups showed that (19%) patients in the intervention and control groups were illiterate. (15%) patients in the intervention group and (19%) patients in the control group had the lit level reading Read and Write. Likewise, (15%) patients in the intervention group and (20%) patients in the control group had primary school graduates literacy. The literacy level of intermediate school graduate was seen in (22%) intervention group patients and (16%) control group patients, and the two groups had a significant difference in terms of education level (P ≤ 0.02). Occupation status of the two groups of patients, it was found that (17%) patients in the intervention group and (18%) patients in the control groups were employed, and (24.69%) patients in the intervention and control group were unemployed. Other patients had the jobs of housewife, self-employed, and retired, and the two groups had a significant difference in terms of their employment status (P ≤ 0.001). 88% of patients in the intervention and control group returned to work after a coronary artery bypass graft. (87%) patients in the intervention group were married and (83%) patients in the control group were married, (8%) in the intervention group and (6%) in the control group were single. Patients' residential area, it was found that (83%) patients in the intervention group and (87%) patients in the control group lived in urban areas. Only (18%) patients in the intervention group had a history of smoking and (17%) patients in the control group had a history of smoking.

Table 1: Socio-demographic characteristics of the study sample (n= 200)

Socio-demographical characteristics	Class	Groups		P-Value*
		Intervention group	Control group	
		Frequency (%)	Frequency (%)	
Age	30-39	7 (22%)	12 (12%)	C.C = 0.13 P=0.1(NS)
	40-49	22 (22%)	24 (24%)	
	50-59	33 (33%)	31 (31%)	
	60-69	27 (27%)	24 (54%)	
	70-79	10 (10%)	7 (7%)	
	80-89	1 (1%)	2 (2%)	
	Mean	54.32 ± (11.123)	56.63 ± (9.74)	
Gender	Male	57 (57%)	59 (59%)	C.C = 0.02 0.886 (NS)
	Female	43 (43%)	41 (41%)	
Education	Illiterate	19 (19%)	19 (19%)	C.C = 0.13 0.023 (S)
	Read and write	15 (15%)	19 (19%)	
	Primary school graduate	15 (15%)	20 (20%)	
	Intermediate school graduate	22 (22%)	16 (16%)	
	Preparatory school graduate	11 (11%)	13 (13%)	
	Institute graduate	12 (12%)	7 (7%)	
	College graduate	4 (4%)	4 (4%)	
	Post-graduate	2 (2%)	2 (2%)	
Occupation before coronary artery bypass graft	Employed	17 (17%)	16 (16%)	C.C = 0.05 0.004 (HS)
	Unemployed	24 (24%)	24 (24%)	
	Housewife	17 (17%)	19 (19%)	
	Self-employed	27 (27%)	29 (29%)	
	Retired	15 (15%)	12 (12%)	
After coronary artery bypass graft	Returned to work	88 (88%)	88 (88%)	1(NS)
	Out of work	12 (12%)	12 (12%)	
Marital status	Single	8 (8%)	11 (11%)	C.C = 0.06 0.5 (NS)
	Married	87 (87%)	83 (83%)	
	Widowed	3 (3%)	3 (3%)	
	Divorced	2 (2%)	3 (3%)	
Residential area	Urban	83 (83%)	87 (875)	C.C = 0.05 0. 553 (NS)
	Rural	17 (17%)	13 (13%)	
Cigarette smoking	Yes	18 (18%)	17 (17%)	C.C = 0.01 0.5 (NS)
	No	82 (82%)	83 (83%)	

Table 2 shows that the clinical information of the patients was that (27%) patients in the intervention group and (30%) patients in the control group were overweight; the two groups did not have significant differences in terms of BMI status. The duration of the disease in the patients showed that (61%) patients in the intervention group and (71%) patients in the control group had a disease duration of less than 5 years. (22%) Patients in the intervention group had disease duration between 5 and 9 years and the rest of the patients had disease duration of more than 10 years. (23%) Patients in the control group had disease duration between 5 and 9 years and the rest of the patients had disease duration of more than 10 years, and the two groups had no significant difference in terms of disease duration. There was a significant difference in the previous hospital admission in the two groups ($P \leq 0.003$). In the intervention group, (59%) patients had a history of one hospital admission, and (23%) patients had a history of two hospital admissions. (13%) patients had a history of admission three times, and (5%) patient had a history of being admitted to the hospital more than three times. In the control group (66%) patients had a history of admission to the hospital once and (23%) patients had a history of being admitted to the hospital twice. (8%) patients had a history of admission three times and (3%) patients had a history of admission to the hospital three times. The history of concomitant diseases in the two groups showed that (41%) patients in the intervention group had hypertension and (21%) patients in the control group had a history of hypertension ($P \leq 0.005$). The history of diabetes showed that (34%) patients in the intervention group had a history of diabetes and (18%) patients in the control group had a history of diabetes ($P \leq 0.015$). In the investigation of ischemic heart diseases in two groups, it was found that (44%) patients in the intervention group had a history of the disease and a history of ischemic heart diseases was observed in (22%) patients in the control group ($P \leq 0.002$). (36%) patients in the intervention group and (16%) had a history of kidney disease ($P \leq 0.001$). (38%) patients in the intervention group and (33%) patients in the control group had a history of other diseases ($P \leq 0.031$).

Table 2: Distribution of the study group's medical data (n= 200)

Medical data	Class	Group		P-Value*
		Intervention group (n=100) F (%)	Control group (n=100) F (%)	
BMI	Normal weight	73 (73)	70 (70)	C.C = 0.05
	Overweight	27(27)	30 (30)	P = 0.77 (NS)
Duration of the disease	< 5	61 (61)	71 (71)	
	5 – 9	22 (22)	23 (23)	C.C = 0.02
	> 10	17 (17)	6 (6)	P = 0.65 (NS)
Previous admission to the hospital	One time	59 (59)	66 (66)	
	Two times	23 (23)	23 (23)	C.C = 0.1
	Three times	13 (13)	8 (8)	0.003 (HS)
	More than three times	5 (5)	3 (3)	
Hypertension	Yes	40 (40)	21 (21)	C.C = 0.2
	No	60 (60)	79 (79)	0.005 (HS)
Diabetes mellitus	Yes	34 (34)	18 (18)	C.C = 0.17
	No	66 (66)	82 (82)	0.015 (S)
Ischemic heart disease	Yes	44 (44)	22 (22)	C.C = 0.22
	No	56 (56)	78 (78)	0.001 (HS)
Kidney disease	Yes	36 (36)	16 (16)	C.C = 0.24
	No	61 (61)	84 (84)	0.001 (HS)
Others	Yes	38 (38)	33 (33)	C.C = 0.16
	No	62 (62)	77 (77)	0.031 (S)

Table 3 indicated that at the beginning of the study and before the start of the intervention, there was no significant difference in the average knowledge score in the general information, risk factor, complication, diagnosis and management of coronary artery bypass grafting sections between the intervention and control group patients. After the intervention, the mean knowledge score in the general information, risk factor, complication, diagnosis and management of coronary artery bypass grafting sections showed a significant increase among patients in the intervention group compared to the control group (P≤0.001). The analysis of the results within the group showed that the sections general information, risk factor, complication, diagnosis and management of coronary artery bypass grafting among patients in the intervention group showed a significant increase compared to the baseline model (P≤0.001). The results showed that the mean overall awareness score in the intervention group at the beginning of the study is lower than the average awareness score after the intervention, and this mean difference is significant (P≤0.001). The mean overall knowledge score in the intervention group has a significant difference compared to the control group. There were no significant differences in the control group at different stages of the study (P > 0.050).

Table 3: Comparison of the mean score of knowledge of Coronary Artery Bypass Grafting between the two groups (n= 200)

Variables	Group	Before the intervention	After the intervention	(t) value	P-value*
General information	Intervention	121.20 ± 54.39	161.21 ± 65.57	40.1	0.001
	Control	124.44 ± 26.14	126.22 ± 45.80	1.78	0.954
	P	0.341	0.001		
Risk factor	Intervention	28.50 ± 43.25	38.60 ± 4.33	10.1	0.001
	Control	29.50 ± 34.65	30.41 ± 32.62	0.91	0.821
	P	0.514	0.001		
Complication	Intervention	25.05 ± 5.02	32.77 ± 47.21	7.72	0.001
	Control	23.10 ± 57.69	21.22 ± 74.26	-1.88	0.914
	P	0.784	0.001		
Diagnosis	Intervention	22.46 ± 7.24	29.80 ± 32.16	7.34	0.001
	Control	24.31 ± 0.21	23.42 ± 66.31	-0.89	0.651
	P	0741	0.001		
management of Coronary Artery Bypass Grafting	Intervention	15.32 ± 88.21	24.20 ± 32.14	8.88	0.001
	Control	15.30 ± 33.83	16.20 ± 55.19	0.9	0.149
	P	0.145	0.001		
Knowledge	Intervention	5317.32 ± 33.	9474.12± 17.	40.84	0.001
	Control	54.3247.36 ±	55.14 ± 69.74	0.82	0.688
	P	0.552	0.001		

Discussion

The mean age of the patients in the control group was 56.63±9.74 years and in the intervention group was 54.32±11.123 years. In the quasi-experimental study conducted by Z Noor et al., (2022) [16] in Kuala Lumpur, Malaysia, it was shown that the mean age group in the control group was 58.14 ± 11.78 and in the intervention group was 57.4 ± 12.3, which is higher than the mean age of the present study in both the control and intervention groups. Also, the two groups did not have a significant difference in mean age, which is consistent with this study. In a study conducted in Saudi Arabia by M Hussain et al., [17] it was shown that the mean duration of chest pain and CAD is less than 5 years, and according to the results of the present study, the duration of the disease is less than 5 years, so the results of these two studies are consistent. Based on the findings of this study, high blood pressure, diabetes, ischemic heart disease, kidney diseases and other diseases were identified in the study subjects, and the patients of the intervention and control groups had significant differences in all co-morbidities. In the study conducted by Ejheisheh et al., [18] co-morbidities were identified as blood pressure, diabetes, dyslipidemia,

and hypercholesterolemia. And among the patients of that study, unlike the present study, there was no difference in blood pressure and diabetes. The clinical trial study was conducted by Yuroong et al., [19] showed that educational interventions before surgery, during surgery and after surgery were useful and effective in improving and increasing the awareness of patients. The aforementioned study and the implementation of the educational program are in line with the results of our study, which has led to an increase in the general awareness of patients about the disease. In our study, after the intervention, there was a significant difference between the intervention and control groups regarding the awareness of risk factors, and the intervention improved awareness in the intervention group. In case of coronary artery disease, a low level of health literacy and a lack of awareness of disease risk factors may have adverse consequences for patients. In a multicenter cohort study conducted by Brørs et al., [20] in Norway and Denmark, after 6 months of follow-up, changes in the risk factors of physical activity, smoking, and psychological factors (HADS -T score, HADS-A score, and HADS-D score) have occurred, and these results are in line with the results of our study, indicating the positive effect of the educational intervention. As a chronic and debilitating disease, heart diseases can result in a high mortality rate, so they can have a significant impact on the lives of patients. In this regard, it is important and necessary to improve and promote the lives of patients and to be aware of the complications and problems of patients. Habibzadeh et al., [21] have shown that nutrition, physical activity, health responsibility, stress management, interpersonal relations and spiritual growth improved significantly and showed the importance of conducting educational programs in patients similar to our study. Increasing awareness and information about the disease is very vital and important for the patient. In a study, the effect of training sessions to improve the knowledge of health care workers in early detection, diagnosis and management of RF and RHD in remote rural areas of western Nepal has been conducted. The results showed that holding training sessions and carrying out the intervention improved the knowledge score about risk factors and disease diagnosis which is consistent with the results of our study on the effect of intervention in increasing the awareness of patients of diagnostic methods. By carrying out interventions and educational programs, awareness can be increased and earlier diagnosis of the disease will be better possible [22].

Coronary artery bypass surgery is one of the most effective treatment methods for cardiovascular diseases. Adherence to treatment and compliance with treatment orders after CABG is essential. The clinical trial study was conducted by Torknejad et al., [23] was shown that the scores of focus on treatment, willingness to participate in treatment, ability to adapt, combining treatment with life adherence to treatment, commitment to treatment and doubt in the implementation of treatment in the intervention group, after the intervention and 3 months after the intervention, had a significant increase compared to the control group. And finally, the mean of knowledge, attitude, behavioral intention, subjective norms and enabling factors in the intervention group has increased significantly compared to the control group. Following treatment regimens and following behaviors related to health is called the healthy adherer effect. Its evaluation is very important in cardiovascular diseases. A cross-sectional study results, by Lee et al., [24] showed that carrying out

educational programs and interventions could improve patients' adherence to treatment regimens and lifestyle modification, and salt consumption, low-fat diet and/or weight loss diet, regular exercise, stress reduction in daily life, drinking in moderation, and smoking cessation of the studied patients were significantly improved in order to improve health. These results, in line with the results of our study, have already revealed the importance and role of interventions and educational programs.

CONCLUSION

The results of this study showed that most of the patients were in the age group of over 50 years, most of the studied patients in both the intervention and control groups were male. And the samples of both groups were at a low level in terms of education, they were mostly married and urban dwellers. Most of the patients had normal weight, their disease duration was less than 5 years, most of the samples had high blood pressure, diabetes, ischemic disease and kidney disease, and the number of smokers in both groups was low. The patients of the two groups had significant differences in demographic variables, disease course, educational background, type of employment before surgery, and previous hospitalization. Improvement in the level of knowledge of patients in the intervention group in general information, risk factors, complications, diagnosis and management of the disease has been established after the intervention. This study proved that the health education program had a positive effect on the coronary artery bypass graft patient's knowledge.

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CONFLECT OF INETEST

The author declares no conflict of interest.

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