Effect of Educational Guidelines on Lifestyle modification and Clinical Outcomes for Patients Undergoing Coronary Artery Bypass Grafting Surgery

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Abstract

Background: Coronary artery bypass grafting (CABG) is one of the most common interventional procedures used worldwide to treat coronary artery disease. Despite patient expectations of the immediate benefits of CABG, some symptoms persist for weeks after hospital discharge, compromising the ability to return to a pre-surgery functional status.

Objective: the study aims to evaluate the effect of educational guidelines on lifestyle modification and clinical outcomes for patients undergoing coronary artery bypass grafting' surgery.

Method: A quasi-experimental design was utilized for the study. A purposive sample of 60 patients undergoing coronary artery bypass grafting' surgery.

Results: There were highly statistically significant differences between the control and the study group subjects regarding a satisfactory level of total knowledge post implementation the educational guidelines at P value < 0.001,while there were highly statistically differences between the control and the study group subjects regarding the lifestyle behaviors post implementation of the educational guidelines at P< 0.001. Moreover there were statistically significant difference regarding total outcomes among control and study group subjects post educational guidelines.

Conclusion: Implementation of the educational guidelines has highly significant positive effect on lifestyle modification and clinical outcomes for the studied patients undergoing CABG surgery.

Keywords: *Lifestyle modification, CABG surgery, patients' outcomes.*

Introduction

Coronary artery bypass grafting (CABG) is a procedure used to help improve and save the lives of thousands of coronary artery disease patients every year. About 90% of patients experience significant improvement after CABG surgery (Martin & Turkelson 2016)[7].

Worldwide, each year more than 300,000 patients is undergo (CAPG) surgery. Approximately one-fifth of them will have recurrence of coronary heart disease symptoms within the first 5 years. This risk increases with age and is higher among women. Up to 30% will have angina in the first postoperative year, increased risk for myocardial infarction, and greater need for re-operation (Saboula, Hussein & Habouh, 2020)[8].

After CABG surgeries healthy lifestyle was associated with significant reductions in the incidence of recurrence of coronary heart disease and clinical risk factors, including diabetes, hypertension, and hypercholesterolemia. Adhering to a healthy lifestyle is associated with a lower risk for complications, including coronary heart disease, stroke, sudden cardiac death and infections. Thus, promoting adherence to a healthy lifestyle has the potential to not only substantially reduce the burden of post-CABG patients but could be a simple, but important, strategy to lower overall morbidity and premature death in cardiac patients (Ali, Yasir, Sherwani, Fareed, Arshad, Abid & Muhammad 2017[2]).

Method

In the present study, a quasi-experimental design was utilized. The study was conducted at cardiac outpatient clinics, inpatient units and post open heart intensive care unit in Academic institute for heart surgery affiliated to Ain Shams University Hospital, Cairo, Egypt. A purposive sample of 60 postoperative patients undergoing coronary artery bypass grafting' surgery, from the previously mentioned setting (the sample will be divided into a study group and control group). The study subjects were selected according to certain inclusion criteria. Type I error with significant level alpha (α) = 0.01 (confidence level 99%). The inclusion criteria were (1) Adult patients, from both genders, prepared to CABG surgery, with no neurological or mental disorders, (2) Patients who are able to comprehend instructions, (3) Patients who are not exposed to any educational or learning experience previously related to CABG surgery, (4) Patients who will agree to participate in the study.

Tools of data collection include (A) Patients' interviewing questionnaire which divided into three parts; socio-demographic data of patients undergoing CABG surgery; medical health profile of patients; and patients' knowledge regarding coronary artery disease, CABG surgeries, lifestyle modification and self-care after CABG surgery. It was developed by the researcher after reviewing the recent and related literatures (Wadie, Shaheen & Nashat 2013[12]; Hinkle & Cheever 2018[6]). Regarding scoring of patients' knowledge assessment questionnaire, the correct answer had got one score while the wrong one had got zero. The scores of each statement were summed up giving a total score, then the total score for all the knowledge questionnaire were calculated and categorized as follows; scores less than 45 (< 75%) was unsatisfactory and scores equal or more than 45 (≥75%) was satisfactory. (B) Lifestyle Indicator questionnaire was a standard tool adapted from (Godwin, Streight, Dyachuk, Hooven, Ploemacher, Seguin & Cuthbertson **2008**[5]) to assess patient' lifestyle behaviors pre-educational guidelines and two months post educational guidelines, including diet, exercise, alcohol consumption, smoking habits, life stress and medication habits, lifestyle total score on a scale of 0 to 12, were categorized as unhealthy (0-4), intermediate (5-8), or healthy lifestyle (9-12). (C) Patient' outcomes assessment questionnaire was adapted from (Schroter and Lamping 2004[10]) to assess patient' outcomes after CABG surgery two and six months post educational guidelines, including symptoms, physical, psychological and cognitive functioning, and the adverse effect of CABG, responses were scored as Yes or No, the responses Yes answer had got one score while the No answer had got zero. Total responses were summed and the sum was expressed as a Percentage, so that 100% were the worst possible score while 0% was the best possible score.

The phases of data collection started by selecting patients who are met the inclusion criteria. The aim and nature of the study was explained to patients. Patients' interviewing questionnaire and lifestyle indicator questionnaire were filled by all the patients (study and control groups' subjects) before the guidelines implementation within 30 to 40 minutes for every patient. The educational guidelines was delivered only for study group subjects, patients' interviewing questionnaire and lifestyle indicator questionnaire were filled again by all the patients two months after the guidelines implementation. Patient› outcomes assessment questionnaire» were filled two month and six months after the guidelines implementation.Data collection process continues for a period ofeight months starting from January 2020 to August 2020.

Statistical Analysis: Data were transferred into SPSSfor window, version 20.0 Armonk, NY: IBM Crop. Quantitative data were presented as mean and standard deviation (SD) to present normally distributed continuous variables. A chi-square test x^2 was used to compare categorical data to determine the differences before and after implementation of lifestyle modification module. The significance of the observed difference was obtained at P value ≤ 0.05.

Results

1. **Patients' characteristics:** Regarding the socio-demographic characteristics of patients under the study, the mean age of the study group was (54.86±5.03), while the mean age of the control group was (54.57±4.25) with no statistically significant differences between them. Regarding the gender, the current study showed that 93.3% of the study group and 90% control group were males with no statistical differences between them. As regard marital status, 86.7% of the study group and 93.3% control group were married. In addition 90% of the study group and 83.3% control group didn't have enough income for treatment.

2. **Patients' knowledge:** This study revealed that the satisfactory level of knowledge during pre-educational guidelines phase has no statistical significant relation between study and control group subjects including patient knowledge regarding CAD, patient knowledge regarding CABG, patient knowledge regarding lifestyle modification, patient knowledge regarding self-care after CABG. While the satisfactory level of knowledge during post-educational guidelines phase has high statistical significant relation between study and control group subjects including patient knowledge regarding CAD, patient knowledge regarding CABG, patient knowledge regarding lifestyle modification and patient knowledge regarding self-care after CABG (P<0.001).

   Regarding the satisfactory level of total knowledge, the current study showed that 36.7% of the study group subject and 30% of the control group subjects had a satisfactory level of total knowledge pre implementation of the educational guidelines. While 93.3% of the study group subjects had a satisfactory level of total knowledge post implementation the educational guidelines with highly statistically significant differences between them (P< 0.001).

3. **Patients' lifestyle behaviors:** Regarding the lifestyle behaviors, table (1) shows that, the lifestyle behaviors during pre-educational guidelines phase has no statistical significant relation between study and control group subjects including diet, exercise, alcohol consumption, smoking, stress and medication adherence with (P >0.05). While the lifestyle behaviors during post-educational guidelines phase has high statistical significant relation between study and control group subjects including diet (**P<0.001**), exercise, smoking, stress and medication at (P**<0.001**), while alcohol consumption have no significance.

4. **Patients' outcomes:** Concerning patients' total outcomes two months post-educational guidelines table (2) revealed that there were highly statistical significant relation between study and control group subjects regarding the effect of patient' condition on total outcomes namely psychological functioning and satisfaction (P <0.001), also there were significant statistical relation on outcomes namely physical functioning and symptoms (p=0.017-P=0.038), while there were no statistical significant relation between study and control group subjects regarding the effect of patient' condition on total outcomes namely cognitive functioning and adverse effect post CABG (P> 0.05). While concerning patients› total outcomes six months post-educational guidelines there were highly statistical significant relation between study and control group subjects regarding the effect of patient› condition on psychological functioning and satisfaction (P <0.001), while there were no statistical significant relation between study and control group subjects regarding the effect of patient› condition on symptoms, physical functioning, cognitive functioning and adverse effect post CABG (P> 0.05).

Table (1): Comparison between study and control group subjects regarding lifestyle behaviors pre and post educational guidelines.

	Pre-educational guidelines						Post-educational guidelines					
	Control group N =30		Study group N = 30		Chi-square		Control group N =30		Study group N = 30		Chi-square	
	N	%	N	%	X^2	P-value	N	%	N	%	X^2	P-value
Diet												
Unhealthy	7	23.3	8	26.7	0.089	0.766 NS	4	13.3	0	0	60.000	<0.001** HS
Intermediate	23	76.7	22	73.3			26	86.7	0	0		
Healthy	0	0	0	0			0	0	30	100		
Exercise												
Unhealthy	27	90	24	80	1.176	0.278 NS	30	100	0	0	60.000	<0.001** HS
Intermediate	3	10	6	20			0	0	15	50		
Healthy	0	0	0	0			0	0	15	50		

	Pre-educational guidelines						Post-educational guidelines					
	Control group N =30		Study group N = 30		Chi-square		Control group N =30		Study group N = 30		Chi-square	
	N	%	N	%	X^2	P-value	N	%	N	%	X^2	P-value
Alcohol consumption												
Unhealthy	2	6.7	1	3.3	1.499	0.473 NS	0	0	0	0	1.491	0.222 NS
Intermediate	7	23.3	4	13.3			9	30	5	16.7		
Healthy	21	70	25	83.3			21	70	25	83.3		
Smoking												
Unhealthy	16	53.3	14	46.7	0.269	0.874 NS	10	33.3	0	0	26.305	<0.001** HS
Intermediate	6	20	7	23.3			12	40	21	70		
Healthy	8	26.7	9	30			8	26.7	9	30		
Stress												
Unhealthy	12	40	12	40	0.554	0.758 NS	12	40	0	0	27.027	<0.001** HS
Intermediate	12	40	14	46.7			13	43.3	6	20		
Healthy	6	20	4	13.3			5	16.7	24	80		
Medication												
Unhealthy	4	13.3	8	26.7	1.667	0.434 NS	0	0	0	0	30.000	<0.001** HS
Intermediate	19	63.3	16	53.3			20	66.7	0	0		
Healthy	7	23.3	6	20			10	33.3	30	100		
Total lifestyle elements												
Unhealthy	18	60	17	56.7	0.748	0.688	15	50	0	0	31.797	<0.001*
Intermediate	10	33.3	9	30			10	33.3	4	13.3		
Healthy	2	6.7	4	13.3			5	16.7	26	86.7		

>0.05 Non significant <0.05* significant <0.001** High significant

Table (2): Percentage distribution of the study and control groups subjects regarding their total outcomes two and six months post educational guidelines.

Items of outcomes Effect of patient' condition on	2 Month post education						6 Month post education					
	Control N =30		Study N = 30		Chi-square		Control N =30		Study N = 30		Chi-square	
	N	%	N	%	X^2	P-value	N	%	N	%	X^2	P-value
Symptoms	4	13.3	0	0.0	4.286	0.038* S	0	0.0	0	0.0	0.000	1.000 NS
Physical functioning	16	53.3	7	23.3	5.711	0.017* S	8	26.7	4	13.3	1.667	0.197 NS
Psychological functioning	11	36.7	1	3.3	10.417	<0.001** HS	10	33.3	0	0.0	12.000	<0.001** HS
Cognitive functioning	3	10.0	0	0.0	3.158	0.076 NS	0	0.0	0	0.0	0.000	1.000 NS
Satisfaction	16	53.3	0	0.0	21.818	<0.001** HS	15	50.0	0	0.0	20.000	<0.001** HS
Adverse effects Post -CABG	12	40.0	6	20.0	2.857	0.091 NS	3	10.0	0	0.0	3.158	0.076 NS
Total outcomes	10	33.3	2	6.7	6.667	0.010*	6	20.0	1	3.3	4.043	0.044*

>0.05 Non significant <0.05* significant <0.001** High significant

Discussion

Regarding the socio-demographic characteristics of patients under the study, the finding of this study revealed that the mean age of the study group was (54.86±5.03), while the mean age of the control group was (54.57±4.25) with no statistically significant differences between them.

These results are in agreement with Fakhry, Balbaa, Senna, and Saleh, (2020), who studied "Timing of coronary artery bypass grafting surgery after acute myocardial infarction that was conducted in Kasr Al-Ainy University Hospitals", and mentioned that the mean of age of patient undergoing CABG surgery was (58.4 ± 7.3) years[4].

In addition, the current study showed that the majority of the study group and control group were males with no statistical differences between them. This might be duo to the elevation of the incidence of coronary artery disease among males than females. These results are similar to the results of Abd Allah, Bakr, Abdallah Abdelrahman, Taha and Kamel, (2020), in a study titled " Preoperative left stellate ganglion block: Does it offer arrhythmia-protection during off-pump CABG surgery? A randomized clinical trial" that was conducted in Assiut, Egypt, and reported that the majority of study subjects were males.[1].

Regarding the satisfactory level of total knowledge, the current study showed that about one third of the study group subject and less than one third of the control group subjects had a satisfactory level of total knowledge pre implementation of the educational guidelines. While the majority of the study group subjects had a satisfactory level of total knowledge post implementation the educational guidelines with highly statistically significant differences between them. This result is in agreement with Torknejad, Babaei and Mirmohammadsadeghi, (2020), who studied "Effect of an educational intervention based on BASNEF model on treatment adherence after coronary artery bypass surgery", and found that, the mean score of knowledge of the patients was significantly higher immediately and 3 months after the intervention in intervention group compared to the control group, and this means that an educational intervention with the appropriate model can increase patients' level of knowledge[11].

The present study revealed that more than half of the study group subjects and about two thirds of control group subjects were practicing unhealthy lifestyle behaviors pre implementation of the educational guideline with no statistically significant difference between them, while the majority of the study group subjects became practicing a healthy lifestyle behaviors post implementation of the educational guidelines with highly statistically differences between two groups. This result in accordance with Safabakhsh, Arbabisarjou, Jahantigh, Nazemzadeh, Rigi, and Nosratzehi, (2016), who mentioned that Health Promotion Program (HPP) were effective on life style changes and health promotion in patients after CABG[9].

It was observed from the current study that the effect of patient' condition on total outcomes among control group subjects more than the effect on study group subjects with statistically significant difference, which mean that the control group subjects was suffering the worst outcomes than the study group, this difference might be related to the effect of implementation the educational guidelines on the study group subjects. This result is similar to Alkan, Topal, Hanedan,andMataracı, (2018), who mentioned that the nursing education and implementation of healthy lifestyle behaviors can influence the outcome[2].

Conclusion

Implementation of the educational guidelines has highly significant positive effect on lifestyle modification and clinical outcomes for the studied patients undergoing CABG surgery, which support the study hypothesis.

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