

Effect of Implementing Discharge Plan on Patient's Outcomes Post Coronary Artery Bypass Graft Surgery

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Abstract

Background: Despite the development of cardiothoracic surgery, many patients still face some postoperative complications and difficulties, which can be ameliorated through continues care and an appropriate discharge plan. **This study aimed to** evaluate the effect of implementing a discharge plan on patient outcomes post Coronary Artery Bypass Graft (CABG) surgery. **Design:** A quasi-experimental research design was used in the study. **Setting:** The study was conducted in the department of Cardiothoracic Surgery and were completed in Outpatients Cardiothoracic Surgical Follow up Clinics at Zagazig University Hospital. **Subject:** A purposive sample of 60 patients were randomly recruited in this study, which divided into two equal groups, study and control (30 patients in each). **Tools:** Four tools were utilized for data collection, knowledge assessment questionnaire, Cardiac Symptoms' Survey, Exercise of Self-Care Agency Scale and lab investigation of lipid profile. **Results:** The mean scores of knowledge, post-operative symptoms' severity, and self-care ability at one month and at three months later of the study group were significantly higher than those of the control group ($p < 0.001$). Also there were a statistically significant difference of the mean score of all lipid profile variables between control and study group. **Conclusion:** implementing a discharge plan was effective in improving patients' clinical outcomes including knowledge, post-operative symptoms severity, self-care ability and lipid profile. **Recommendation:** Discharge plan for patient undergoing CABG surgery should be implemented in pre and post-surgery, as well as during follow up.

Keywords: CABG surgery, Discharge plan, patient's outcomes.

Introduction:

Coronary Artery Disease (CAD) is one of the non-communicable diseases. It has become a significant public health issue in the developing countries. CAD ranges from 14.5-65.4 /1000 population, this significant change can be attributed to increased prevalence rates of hypertension, diabetes, smoking, and low physical activity, that mainly caused by dietary habits and changes in lifestyle that includes a stressful life and diet high in cholesterol (Kamal et al., 2018). The World Health Organization (WHO) estimates that in 2020, CAD will be the cause of 15.3 million deaths, or 30% of all deaths. Global and Regional Projections of Mortality and Burden of Disease predict that over the next 20 years, CAD will continue to be the top cause of mortality (Braggion et al., 2015).

Coronary Artery Bypass Graft is a widespread surgical treatment for cardiovascular disease. It is considered a life-

saving procedure, but the early recovery period reveals a number of difficulties for all patients, caregivers and nurses. Furthermore, the period of recovery following CABG is considered one of the most stressful and crisis-ridden times, and is associated with physical and psychological problems. The first few weeks following recovery can be extremely stressful with uncertainty in prognosis, unjustified symptoms, or issues with the therapeutic plan (Mohsenipouya et al., (2018).

The continued of symptoms experienced by the patients who undergo CABG has consistently recorded in many literatures. The symptoms of physical experienced by the patient include shortness of breath, difficulty sleeping, fatigue, pain and edema. While psychological symptoms consisted of depression and anxiety. Demonstrable evidences on management strategies and self-managed practices instituted to prevent and treatment these symptoms, the rest has been described by post CABG patients to

overwhelmed dyspnea, sleep disturbances, fatigue, anxiety and depression (**Al-Daakak et al., 2016**). Therefore, discharge planning and education for post-CABG is a vital component of medical and nursing care which aimed at helping patients in caring for themselves at home after discharge from the hospital (**Mansin., 2017**). Early and appropriate discharge planning built on in-depth knowledge of the post discharge understanding will help to ensure optimal recovery (**Banerjee, 2013**).

The nursing discharge planning is a constant process that begins during early hospital stay and continues through post-discharge follow-up of CABG surgery; in order to reduce readmissions to hospital, contribute to medical stability through improving patients' knowledge and improving self-care abilities to increase self-care management, maintenance, and confidence in coping with their condition, which in turn enriches their quality of life(QOL). Education gives patients with the information they need to understand their disease, surgery, and recovery; as well as to prevent and manage postoperative symptoms; and to decrease hospital readmission, morbidity, and mortality rates (**Bikmoradi et al., 2017**).

Nurses play an important role for patients undergoing cardiothoracic surgery by serving to coordinate care, providing emotional support at the time of diagnosis, providing information and assistance in decision-making, treatment, continuous assessment and care during and after treatment (**Soltis., 2015**). Fixed characteristics such as age or sex only play a minor effect in quality of life (QOL) and others are potentially controllable. Thus, QOL of cardiothoracic surgery survivors has been improved by a variety of interventions such as decreasing psychological morbidity, providing crisis adjustment educational programs, psychosocial interventions, support groups coping, cognitive behavioral therapy, and certain medication. Whenever possible a moderate physical activity should be recommended to relieve symptoms such as chest pain, anxiety, insomnia and fatigue, (**Marventano et al., 2018**).

Today, the patient hospitalization time after cardiac surgery is recently shortened and

patient during convalesces and recovery period spent at home without ongoing nursing and medical care. In order to promote the patients' quality of life and avoid post-operative complications, the necessary training is needed to confirm the patients' post-surgical life. Patients' compliance with medical advice as well as adjusted lifestyle is required. Thus, in order to force a better outcome for the patient and prevent further complications, it seems important to educate patients on how to behave and what actions to take care of themselves (**Tayebeh et al., 2014**).

Significant of Study

According to the most recent WHO data published in 2017 cardiothoracic surgery in Egypt, was 2.91% in males and 2.31% in females per 100,000 populations. Nearly 39% of patients undergoing cardiothoracic surgery will have progressive disease and 19% will be diagnosed with late complications (**WHO., 2017**). The pre-operative health education for CABG patients is very important for the nurses, because it gives nurses as it gives them the opportunity to share their knowledge with patients and provide them with psychological and emotional support in difficult postoperative situations. It's critical that nurses have accurate information about cardiothoracic surgeries (**Kessler., 2017**). Therefore, it is very important to determine the impact of discharge plan on recovery period following cardiothoracic surgery

Aim of the study:

This study aimed to evaluate the effect of implementing a discharge plan on patient's outcomes post CABG surgery.

Research hypotheses:

The following research hypotheses were developed in order to achieve the aim of this study:

H1: Patients who will be received a discharge plan instructions have a higher mean knowledge score than patients who didn't.

H2: Patients who will be received a discharge plan instructions have a lesser mean symptoms severity score than patients who didn't.

H3: Patients who will be received a discharge plan instructions have a higher mean self-care ability score than patients who didn't.

Operational definition:

Discharge planning: Refers to the development of discharge plan instructions for patients following CABG surgery. It begins at the time of hospital admission till the discharge day and continue after patient discharge for follow-up patients.

Patient Outcomes: In this study were measured improvement of knowledge, postoperative symptoms' severity, self-care ability and lipid profile means scores.

Materials and Methods:

Design: A quasi-experimental research design (case and control) was used to fulfill the study aim.

Setting: This study was conducted in the Cardiothoracic Surgery Department, after that, it was completed in out-patient's Cardiothoracic Surgical clinics at Zagazig University Hospital. The inpatient unit is located on the fifth floor of the Sednaoui Cardiothoracic Hospital, which is affiliated with Zagazig University Hospitals and consists of two wards (ward for male and ward for female every ward consists of 8 rooms and every room contains 3 beds). The Cardiothoracic Outpatient Clinic were located on the 2nd floor of the Outpatient Clinic Building at Zagazig University Hospitals and consists of two clinics, the first clinic for diagnosis and another for follow up of cardiothoracic surgery patients.

Subjects: A Purposive sample of 60 patients undergoing CABG surgeries who admitted to the Cardiothoracic Surgery Department. The sample size for this study was calculated as $\alpha = 0.05$ and $\beta = 20$ percent, so we expected to test hypotheses at 80 percent. As a result, sixty patients were divided into two groups (thirty patients in each): Group I: **The study group** received an individualized discharge plan, while Group II: **The control group** received routine hospital care.

Inclusion criteria: Patients were selected based on the following criteria: Age 20 years or older, both genders, diagnosis of coronary artery disease, hospitalized for planned CABG surgery, and accepted to participate in the study, while patients with post-operative complications, such as (angina, heart block, uncontrolled arrhythmia and fever) were excluded.

Data Collection tools

Four tools were utilized for data collection.

Tool (I): knowledge assessment questionnaire: This tool was developed by the researchers based on updated literature reviews (Douglas & King, 2011; Benjamin R S., 2012 & Bonow et al., 2012) constructed in an Arabic form, and divided into three parts:

Part 1: Concerned the demographic characteristics of the study participants, including: Age, gender, marital status, level of education, occupation, and place of residence.

Part 2: Medical data such as past medical history, graft type, graft number, post-ICU length of stay etc.

Part 3: Patient knowledge questionnaire sheet: It was design to assess the patient's knowledge which consists of thirty-five multiple choices question cover the following: heart and coronary arteries structure, nature of CABG, purpose & types of CABG, indication and contraindication of CABG and complication of CABG, experienced problems after surgery, managing postoperative problem, diet, medication, and follow-up timetable. The scoring system was as follows: one for the correct answer, while the wrong or don't know answer given zero. The total obtained scores ranged from 0 to 35. The total score divided by the number of items, and it was converted into a percentage. The overall knowledge score was considered satisfactory when the percent score was equal or greater than 60%, and unsatisfactory when less than 60%.

Tool (II): Cardiac Symptoms Survey (CSS), the Arabic version of this survey created by Al-Daakak (2016), based on the original

instrument developed by Nieveen, et al. (2008). This scale contains of ten post CABG symptoms (shortness of breath, angina, depression, fatigue, incision pain, swelling in the leg, trouble sleeping, and poor appetite, fluttering heartbeat, and anxiety). This scale formerly assessed symptom perception, evaluation, and response for the 10 symptoms over the past seven days Rate the frequency of symptoms on a scale from "none" 0 to "all the time"10. The severity graded from "none" "0" to "extremely severe" "10". The mean of the frequency and severity of each symptom was calculated to provide (mean of symptoms distress) for each symptom.

Tool (III): Exercise of self-care agency scale (ESCAS), this instrument was adopted from Erci, Yilmaz & Budak., (2017) and composed of thirty-five items on a 5-point Likert scale ranging from 0 (does not describe me) to 4 (describes me completely). The total score ranges from 0 to 140. Scores less than 82 demonstrate a low level of self-care ability, scores from 82 and 120 were indicated moderate, and scores of 120 indicated a high level of self-care ability.

Tool IV: Lab investigation of lipid profile includes total cholesterol, high density lipoprotein, triglyceride and low density lipoprotein

Tool validity and reliability:

The validity was conducted to test the applicability, completeness, and relevance. Modification and approval through five experts in fields of medical - surgical, critical care and emergency nursing, faculty of nursing at Assuit, South valley and Zagazig university. Their comments on the tool format, design, and modifications were made accordingly. The reliability of the tools was tested using the test and retest measure and Cronbach's alpha. Reliability of tool I, II, III and IV was (0.84, 0.87,89 and 82 respectively).

A pilot study was performed on 10% of the study sample to assess the clarity and applicability of the tools, as well as to detect the difficulties that encountered

through data collection process. These patients not included in the study.

Procedure

An official approval for conducting the study was obtained from the hospital director, and the director of Cardiothoracic Surgery Department. Measures have been taken to safeguard the ethical rights of patients. Each patient was pre informed and asked to sign a written consent after explaining the aim and the nature of the study. The study was conducting in four phases; assessment, planning, implementation, and evaluation phase.

The duration of discharge plan implementation was 10 months, which beginning from June 2018 to the end of March 2019.

Assessment phase:

It involves collecting data from every patient in both the study and control groups, individually to collect the baseline patients' data using tools I, II, III and tool IV. This interview lasted between 30 and 40 minutes. To avoid transmission of the intervention to the control group, data were collected first from the control group over four months. After reaching 30 patients for the control group, data collection stopped and data from the study group started. Data collection for the study group took 6 months to complete.

Planning Phase

The discharge plan prepared and designed for the studied patients according to patient assessment needs and their level of understanding. Then the patient's discharge plan guide was created for the study group participants based on the assessment phase. Furthermore, an educational booklet was prepared in a simplified Arabic language with many color illustrations picture to encourage learning and facilitate patient understanding.

Implementation Phase

The study's purpose was explained to each participant in the study group. A colored booklet was distributed to each patient with various teaching methods were used during

the sessions e.g. interactive lecture, demonstration, re-demonstration, discussion, educational media include printed handout, pictures, and video programs. Which was introduced in an organized, and concise manner. The program was delivered in four sessions were started from two days before surgery it was included (two sessions), as well as two sessions during the patients' hospital stay following surgery, each session was last from 30 to 45 minutes. All of the training sessions were held in the Cardiothoracic Surgery Department.

The first session: was carried out during assessment phase, for establishing of relationship, and for orient the patient about the importance, content, and schedule of the program. (Before surgery at the day of admission)

The second session involved (Heart and coronary arteries structure, nature of CABG, purpose & types of CABG, indication and contraindication of CABG and complication of CABG). (Before surgery at the second day of admission)

The third session involved (experienced problems after surgery, how to manage experienced symptoms post-surgery). (3–4 days after surgery and after hemodynamic symptoms stabilized)

The fourth session involved (diet, medications, and follow-up schedules). At the day of discharge

During each session, the researcher was give break time based on patients' requirements. In addition, at the end of each session, the researcher was taking an immediate feedback from the patents.

Patients in the study group were asked to call the researcher, when they required information during their hospitalization or after discharge and if they faced anxiety or emergencies.

Patient follow-up after surgery was done at an outpatient clinic after one and three months of discharge to ensure whether the patient implemented the trainings given at the hospital.

For the control group: Patients in the control group received routine care, such as preoperative and post-operative nursing care. The planned discharge program was not applied to this group. Each patient was interviewed for about 15 minutes in order to collect data from them using all study tools, and follow-up following surgery was done at outpatient clinic after one and three months of discharge.

Evaluation Phase

Following the implementation of the discharge plan instruction, each patient in the study and control group was evaluated their knowledge at discharge using tool I (part 3), after one month the patients were evaluated in outpatient clinics using study tools II III, and IV. After three months of intervention implementation, patients were evaluated in outpatient clinics using the study tools I (part 3), II, III, and IV.

Ethical considerations:

The ethical approval was acquired from the ethical committee of research of Faculty of Nursing, Zagazig University. Written consent was obtained from the study participants after the purpose of the study was explained. The participants' confidentiality and privacy of the data collected were protected. The patient right to withdraw at any time was guaranteed.

Statistical analysis:

The data collected were tabulated and statistically analyzed using an IBM computer and the statistical package for social science (SPSS) advanced statistics, version 20 (SPSS Inc., Chicago, IL). The mean and standard deviation were used to express numerical data. To examine the relationship between qualitative variables, the Chi-square test was used. The student t-test was used to compare quantitative data between two groups. A p -value < 0.05 was considered significant.

Results

Table (1): Showed distribution of demographic characteristics of the studied groups, it can be noticed that the mean age of the control group was 48.20 ± 7.27 years and of the study group was 49.66 ± 6.24 years.

Regarding gender, (60.0%) of the control group and (66.66%) of the study group were males. Regarding patient's educational level, it was found that (30.0%) of the control group and (36.66%) of the study group were illiterate. Regarding the marital status, it was cleared that (73.33%) of the control group and, (66.66%) of the study groups were married. Concerning patients' occupation, it is obvious that, (33.33%) of the control group and (36.66 %) of the study group were free work. In relation to residence, (53.33%) of the control group and 46.66% of the study group lived in a rural area. There were no significant differences between the study and control groups regarding demographic characteristics.

Table (2) Demonstrated distribution of health history among studied groups, this table showed that, concerning patient's family history, it noticed that (70.0%) of the control groups compared to (60%) of the study group had positive family history of coronary heart disease. In relation to smoking, (46.66%) of the study group and (56.66%) of the study group were non-smoker. In addition, this table showed that (60.0%) of the control group and (66.66%) of the study group were stayed less than three days in Intensive Care Unit (ICU). On the other hand, (60.0%) of the control group and (53.33%) of the study group were complained of hypertension. Regarding body mass index, (46.66%) of control and (40.0%) of the study group had overweight. In relation to number of grafts, (20.0%) of the control group and (13.33%) of the study group made previous one graft. Moreover, (33.33%) of the control group and (40.0%) of the study and were received educational information about CABG by a health care professional. There were no statistically significant differences between both groups in all items of health history variables.

Tables (3) Illustrated that the majority of control and study group had unsatisfactory level knowledge in all item regarding CABG surgery information and post discharge knowledge pre the implementing discharge plan. In addition, this table showed that the study group showed marked improvement in their knowledge at discharge and post three-months follow-up in all items regarding CABG surgery information and post discharge

knowledge with significant difference at $p < 0.05$.

Figure (1): Displayed that differences between studied groups according to total level of knowledge during the study periods, the majority (80%) of the control group and (83.33%) of the study group had unsatisfactory knowledge in pre implementing discharge plan, however the majority of the study group had satisfactory knowledge at discharge when compared by control ones (90.0% vs. 36.66%) respectively with statistically significant difference between both groups ($\chi^2 = 18.37$, $P = 0.000^*$). Also, post three-months follow-up (86.66%) of the study group had satisfied knowledge versus (33.33%) of the control group with statistically significant difference ($\chi^2 = 17.77$, $P = 0.000^*$).

Table (4): Illustrated that there was no statistical significant difference in mean score of knowledge pre implementing discharge plan instruction between both groups. Also, there was a highly significant increase in mean knowledge scores of the study group compared to the control group at discharge and post three-months follow-up, after implementing the discharge plan at $p < 0.001^*$.

Table (5): Revealed overall mean scores of post-operative symptoms severity experienced by patients in both group during study period, it can found that at discharge there were no statistical significant difference between both groups. Post one month follow up there were statistical significant differences only in some symptoms as (chest/ leg pain, anxiety, sleep troubles, anorexia, fatigue, shortness of breath, and depression) at p value (< 0.05) between both groups. After three months follow up, there were improved in symptoms experienced with statistical significant difference between both groups.

Figure (2): Presented frequency distribution of self-care ability, it noticed that (46.66) of the control group and (50%) of the study group had low self-care ability in pre implementing discharge plan with no statistical significant difference between them. There was statistical significant difference with improved in self-care ability of study group when compared with control group at post one and

three months' follow-up period after implementing discharge plan at $p < 0.05$.

Table (6): Displayed overall mean scores of self-care ability among control and study groups. There was no statistical significant difference in mean score of self-care ability between both groups pre implementing discharge plan instruction, while there was increase in mean score of self-care ability in the study group compared to control group with statistical significant difference between both

groups post one and three months after implementing of discharge plan ($p \leq 0.05$).

Table (8): Displayed Comparison of mean scores of lipid profile among studied groups, there was no statistical significant difference in mean score of all lipid profile variables between study and control groups at pre implementing discharge plan instruction, while there were statistically significant differences in all lipid profile variables were found between study and control groups post one and three months' follow-up period $p < 0.05$

Table (1): Distribution of the studied patients according to the demographic characteristics.

Socio-demographic data	Control group N=30		Study group N=30		χ^2	P. value
	N	%	N	%		
Age						
30< 40	2	6.66	3	10.0	1.86	4.32
40< 50	10	33.33	11	36.66		
50-60	18	60.0	16	53.33		
Mean \pm SD	48.20 \pm 7.27		49.66 \pm 6.24		0.837	0.406
Sex						
Male	18	60.0	20	66.66	0.287	0.592
Female	12	40.0	10	33.33		
Marital status						
Single	3	10.0	4	13.33	1.07	0.818
Married	22	73.33	20	66.66		
Divorced	2	6.66	1	3.33		
Widow	3	10.0	5	16.66		
Education						
Illiterate	9	30.0	11	36.66	0.681	0.898
Basic	9	30.0	8	26.66		
Secondary school	10	33.33	8	26.66		
University	2	6.66	3	10.0		
Occupation						
Employee	6	20.0	7	23.33	0.278	0.895
Free work	10	33.33	11	36.66		
Not work/housewife	14	46.66	12	40.0		
Residence						
Urban	13	43.33	16	53.33	0.601	0.438
Rural	17	56.66	14	46.66		

Table (2): Distribution of the studied patients according to health history

Health history	Control group (n=30)		Study group (n=30)		χ^2	P. value
	N	%	N	%		
Family history of coronary heart diseases						
• Yes	18	60.0	21	70.0	0.659	0.417
• No	12	40.0	9	30.0		
Smoking						
• Smokers	5	16.66	7	23.33	0.682	0.786
• Pervious smoker	8	26.66	9	30.0		
• Non-smokers	17	56.66	14	46.66		
Length of ICU stay (days):						
• <3 day	20	66.66	18	60.0	0.387	0.592
• \geq 3 days	10	33.33	12	40.0		
Comorbidities						
• Hypertension	16	53.33	18	60.0	0.271	0.602
• Diabetes mellitus	13	43.33	12	40.0	0.069	0.793
• Myocardial infarction	1	3.33	2	6.66	0.351	0.554
• Hyperlipidemia	23	76.66	20	66.66	0.739	0.390
Body mass index (BMI)						
• Underweight (< 18.5)	0	0.0	2	6.66	2.662	0.557
• Normal (18.5-24.9)	8	26.66	10	33.33		
• Overweight (25-29.9)	14	46.66	12	40.0		
• Obese (\geq 30)	8	26.66	6	20.0		
Number of grafts						
• One	4	13.33	6	20.0	1.182	0.657
• Two	15	50.0	11	36.66		
• More than two	11	36.66	13	43.33		
Previous CABG educational information						
• Mass media	7	23.33	5	16.66	4.765	0.332
• Health care professional	12	40.0	10	33.33		
• Friends and Relatives	2	6.66	0	0.0		
• Internet	2	6.66	6	20.0		
• None	7	23.33	9	30.0		

Table (3): Differences between satisfied knowledge regarding CABG among control and study groups at pre, at discharge and post three-month after implementing the discharge plan

Variables	Control group						Study group						χ^2 (P1)	χ^2 (P2)	χ^2 (P3)
	Pre		At discharge		3 month follow up		Pre		At discharge		3 month follow				
	No	%	No	%	No	%	No	%	No	%	No	%			
knowledge about CABG surgery															
-Heart and coronary arteries structure	6	20.0	6	20.0	6	20.0	7	23.33	25	83.33	24	80.0	0.098 (0.754)	24.09 (<0.001)*	21.60 (0.001)*
Nature of CABG	12	40.0	14	46.66	13	43.33	13	43.33	26	86.66	26	86.66	0.069 (0.793)	10.88 (0.001)*	12.38 (<0.001)*
Purpose & types of CABG	2	6.66	3	10.0	3	10.0	4	13.33	23	76.66	21	70.0	0.741 (0.389)	27.14 (<0.001)*	22.50 (<0.001)*
Indication & contraindication of CABG	4	13.33	6	20.0	6	20.0	3	10.0	28	93.33	26	86.66	0.162 (0.688)	32.85 (<0.001)*	26.78 (<0.001)*
-Complications of CABG	8	26.66	11	36.66	10	33.33	10	33.33	30	100.0	29	96.66	0.317 (0.573)	27.80 (<0.001)*	26.44 (<0.001)*
Post discharge knowledge															
-Wound Care and infection prevention	8	26.66	13	43.33	11	36.66	6	20.0	28	93.33	26	86.66	0.373 (0.542)	17.33 (<0.001)*	15.86 (<0.001)*
Exercise and rest	7	23.33	11	36.66	10	33.33	9	30.0	23	76.66	22	73.33	0.341 (0.559)	9.77 (0.002)*	9.64 (0.002)*
-Pain control	6	20.0	8	26.66	7	23.33	8	26.66	24	80.0	22	73.33	0.373 (0.542)	17.14 (<0.001)*	15.01 (<0.001)*
-Diet	15	50.0	18	60.0	17	56.66	13	43.33	27	90.0	25	80.0	0.268 (0.605)	7.20 (0.007)*	5.07 (0.02)*
-Medication	10	33.33	14	43.33	13	43.33	11	36.33	30	100.0	29	96.66	0.073 (0.787)	21.81 (<0.001)*	20.31 (<0.001)*
-Follow up care	14	46.66	17	56.66	16	53.33	12	40.0	28	93.33	25	83.33	0.271 (0.602)	10.75 (0.001)*	6.23 (0.01)*

P1: The differences between study and control as pretest**P3: The differences between study and control at 3months Follow-up****P2: The differences between study and control at discharge***** significant P value ≤ 0.05**

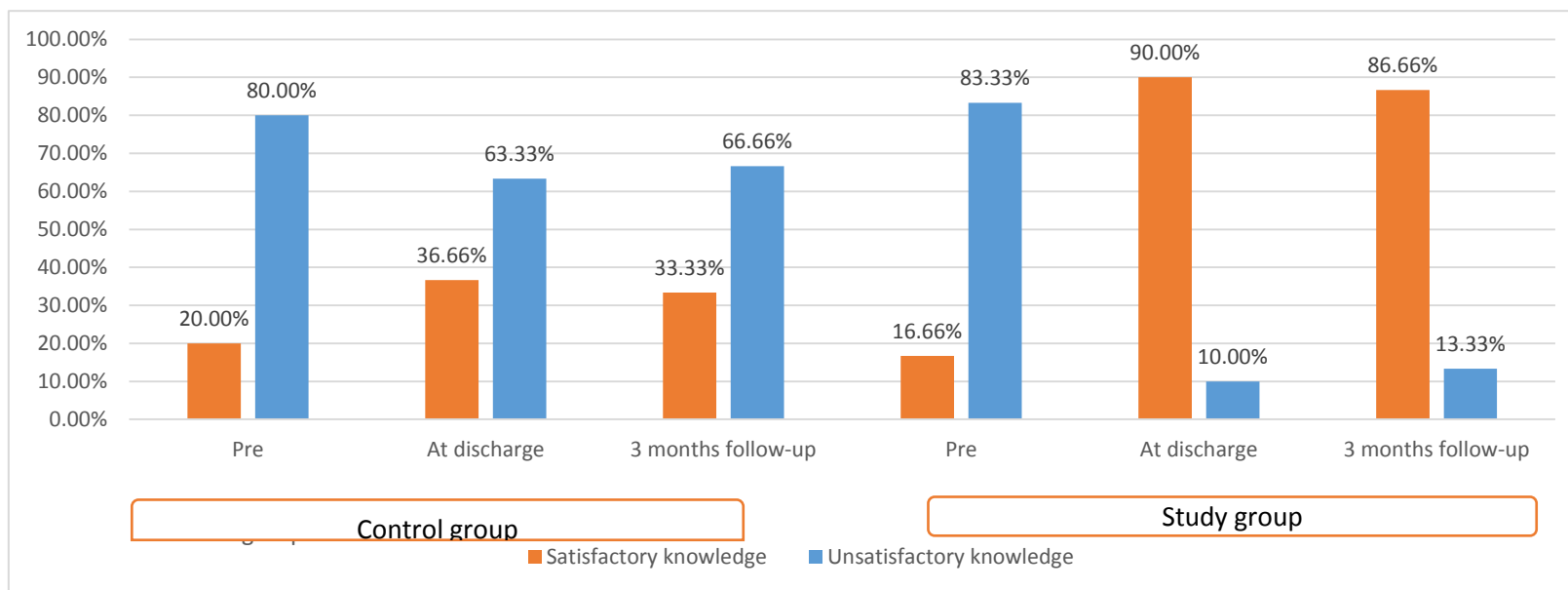


Figure (1) Differences between studied groups according to total level of knowledge during the study periods

Table (4): Overall knowledge mean scores regarding CABG among control and study groups pre, at discharge and post three-month after implementing the discharge plan

Variables	Groups	Control group N=30	Study group N=30	T-test	P .value
		Mean ± SD	Mean ±SD		
Pre		12.26 ±1.83	12.03 ±1.68	0.094	(0.650)
At discharge		15.86±1.96	28.73±1.54	5.15	(<0.001)*
3 months follow up		14.76±1.88	26.23±1.75	4.46	(<0.001)*

Table (5): Comparison of the mean score of post-operative symptoms severity experienced among control and study groups, at discharge, post one and post three-months after implementing the discharge plan

Symptoms	Control Group (n=30)			Study Group (n=30)			Independent T test		
	At discharge	One month follow up	3 months follow up	At discharge	One month follow up	3 months follow-up	P ₁	P ₂	P ₃
	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD			
Chest/leg incision pain	3.80±1.74	2.94±1.33	2.18±1.24	4.18±1.45	2.09±0.98	1.47±0.7	1.14 (0.256)	3.97 ($< 0.001^*$)	2.75 (0.007*)
Anxiety	1.62±1.04	1.42±1.07	1.22±1.05	1.47±0.66	1.02±0.55	0.72±0.97	0.77 (0.439)	2.21 (0.03*)	2.34 (0.02*)
Sleeping troubles	3.12±1.25	2.66±0.84	2.42±0.92	2.09±1.21	2.75±1.14	1.75±1.22	1.48 (0.141)	2.65 ($< 0.001^*$)	3.14 (0.003*)
Anorexia	2.32±1.62	1.88±1.47	1.34±1.55	1.88±1.43	1.92±1.21	0.79±0.85	1.36 (0.176)	2.07 (0.04*)	2.61 (0.04*)
Fatigue	3.52±2.78	2.74±2.99	1.74±1.97	3.74±2.03	1.62±2.17	0.980±1.11	0.451 (0.653)	2.139 (0.03*)	2.36 (0.02*)
Legs swelling	1.38±2.19	1.26±1.93	1.12±1.184	1.18±1.64	0.86±1.26	0.64±1.10	0.515 (0.608)	1.20 (0.233)	1.57 (0.118)
Shortness of breath	1.96±1.95	1.76±2.04	1.14±1.55	1.84±1.60	0.64±0.85	3.48±1.23	0.335 (0.738)	2.07 (0.04*)	1.99 (0.04*)
Angina	1.10±1.56	1.02±1.59	0.94±1.58	0.94±0.89	0.74±0.59	0.54±0.57	0.627 (0.532)	1.16 (0.449)	1.76 (0.09)
Depression	1.48±1.87	1.14±0.98	1.08±1.08	1.38±1.63	0.72±1.03	0.64±1.01	0.284 (0.777)	2.07 (0.04*)	2.10 (0.03*)
Fluttering /tachycardia	1.62±1.52	0.98±0.93	0.88±0.91	1.10±1.56	0.70±1.10	0.52±0.88	1.68 (0.09)	1.43 (0.155)	1.99 (0.04*)

P1: The differences between study and control at discharge

P2: The differences between study and control post one-month

P3: The differences between study and control at 3month Follow-up

*** significant P value ≤ 0.05**

Figure (2): Frequency distribution of self-care ability among the control and study groups at pre, post one and three-month after implementing of discharge plan

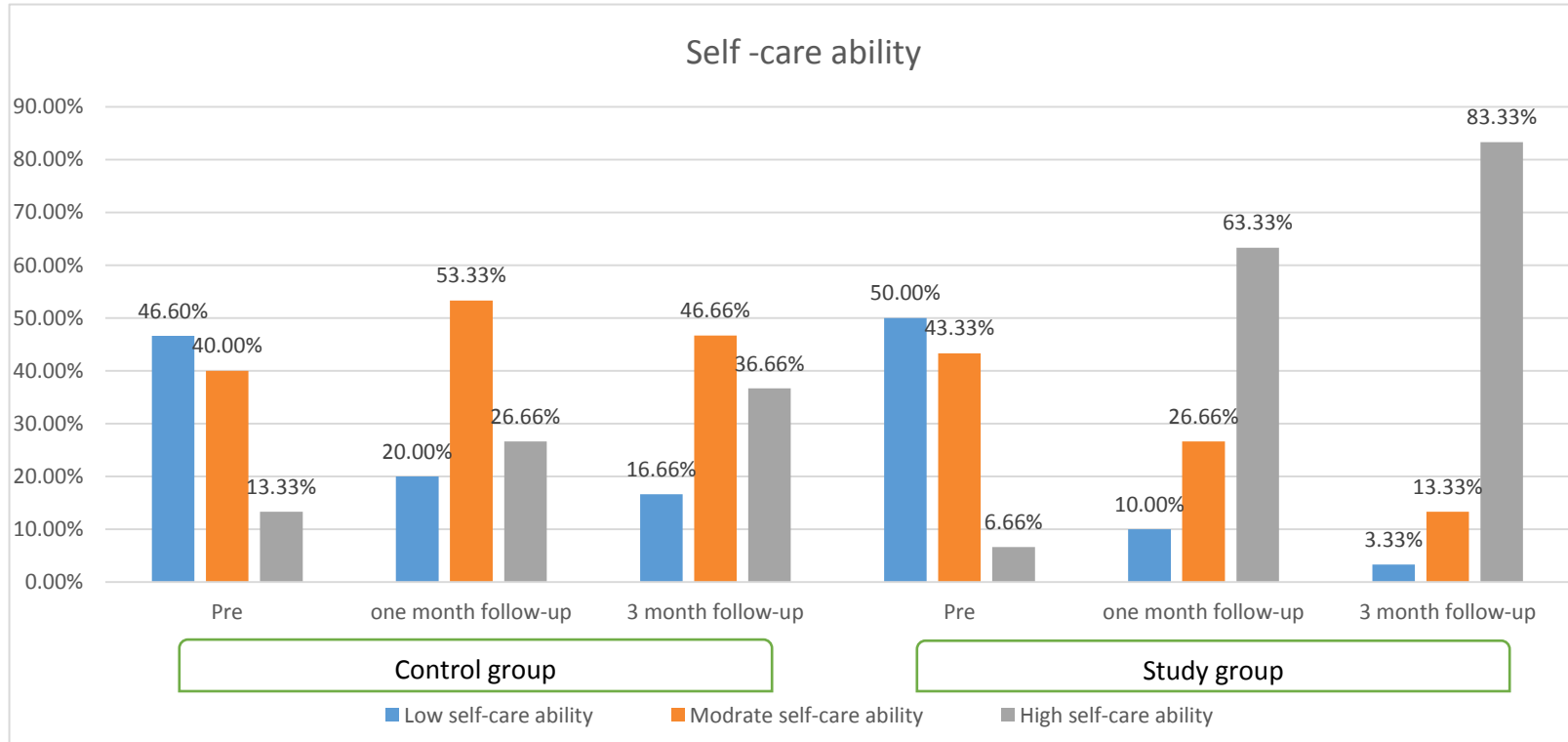


Table (6): Comparison of overall mean scores of self-care ability among control and study groups at pre, post one and three-months after implementing the discharge plan

Variables	Control group N=30	Study group N=30	t-test	P .value
	X ⁻ ± SD	X ⁻ ±SD		
Pre	92.20±16.47	90.73±16.31	0.346	(0.730)
One month follow-up	99.6±17.28	113.60±16.60	3.18	(0.002)*
3 months follow-up	104.16±16.55	120.10±14.77	3.93	(<0.001)*

Table 7: Comparison of mean scores of lipid profile among control and study groups at pre, post one and three-months after implementing the discharge plan

Lipid profile	Control Group (n=30)	Study Group (n=30)	t-test	P .value
	Mean ±SD	Mean ±SD		
Total cholesterol (mg/dl)				
Pre	230.13±33.90	226.60±34.92	0.398	0.692
One-month follow-up	222.93±29.54	198.86±18.90	3.75	0.001*
3 months follow up	219.90±29.87	193.86±11.1	4.47	<0.001*
Triglycerides (mg/dl)				
Pre	221.43±29.23	219.43±28.91	0.266	0.791
One-month follow-up	218.10±28.73	198.63±19.56	3.06	0.003*
3 months follow up	215.80±28.66	188.50±19.34	4.32	<0.001*
Low density lipoprotein (mg/dl)				
At discharge	148.26±17.19	146.06±17.18	0.496	0.622
One-month follow-up	146.60±18.21	135.03±23.08	2.15	0.03*
3-months follow-up	141.60±19.95	129.70±19.92	2.31	0.02*
High density lipoprotein(mg/dl)				
Pre	39.86±11.56	38.93±11.95	0.307	0.760
One-month follow-up	40.60±11.61	33.76±9.98	2.44	0.01*
3 months follow-up	40.96±11.99	33.26±9.22	2.78	0.007*

Discussion:

Coronary artery bypass graft surgery is an increasingly overriding treatment modality for CADs, the leading cause of death worldwide and responsible for 30% of all deaths worldwide. It provides a beneficial outcome that improve quality of life and minimize mortality and morbidity in CAD patients who are at risk of serious complications such as bleeding, blood clots, lung problems, infection at the incision site, abnormal heart rhythms, failure of the graft, kidney failure, and death (Akbari & Celik., 2015). All patients with CABG surgery suffered at least one problem after discharge from the hospital, therefore it is crucial to

provide them with accurate and up to date information and training to effectively handle with any issues that arise (Bell et al., 2017). So, the aim of the study was to evaluate the effect of discharge plan on patient's outcomes after CABG surgery.

Regarding demographic characteristics, the result of the present study found that, more than half of the studied patients in both groups with age from fifty to sixty years old, these finding in consistent with Fredericks & Yau., (2017) who discovered that more than half of the study subjects were over the age of forty years. The result also revealed that, nearly two thirds of the patients in both groups were males. These findings contradicted with

Ferreira et al., (2015) who revealed that, females are more likely to undergo CABG, and spend prolonged time in hospital.

The current results showed that, most of the studied patients in both groups were married. These findings agreed with **Alkubati et al., (2013)** who stated that, most of the patients in their study were married. This could be due to that most of the study subjects were in the marriage age and were exposed to stress of everyday life events. One of the noticeable finding of the study was that, about one third of both group were illiterate and the majority of them were not working or housewife. These findings gone with **Sadek., (2012)** who found that, almost half of patients under the study were illiterate and not worked. This may be attributed to low socioeconomic standards for patients attended the study.

Concerning health history of both groups, the current study indicated that, there were the majorities of them had family history of coronary heart disease. These findings gone with **Alkubati et al., (2013)** who mentioned that nearly half of the studied subject had family history of heart diseases. This result may be due to family members share genes, behaviors, lifestyles, and environments that can influence their health and their risk for disease. In relation to smoking approximately half of control and study group were non-smoker, this result was incongruent with **Samet., (2013)** who found that, about two third of the study subjects were smoker. This could be due to the fact that, most of the studied patient were stopped smoking as a result of physician and nursing instruction to improve their health.

In relation to comorbidities, the current results revealed that, the major percent of both group have hyperlipidemia followed by hypertension (HTN). Also, less than half of both groups had diabetes mellitus (DM). This result was agreement with **Scrutinio & Giannuzzi., (2016)** who discovered that, about one third of the patients undergoing CABG surgery had DM, nearly one fifth had chronic obstructive pulmonary disease, sixteen percent had peripheral vascular disease, nearly one fifth had chronic obstructive pulmonary disease, and more than one quarter had renal dysfunction. This was supported by **Kramarow, Lubitz &**

Francis., (2013) who found that, several risk factors for CVD including HTN, smoking, DM, dyslipidemia, obesity, unhealthy diet and lack of physical activity all of which exhibit changing trends over time. This may be linked to the substantial increase of DM and HTN considering individuals' physical inactivity, poor eating habits, and busy work life.

Concerning patients' length of ICU stay, the majority of both groups stayed for less than three days. Also, in the same context **Azarfarin et al., (2014)** stated that, nearly one third of the patients spent more than (> 96 hours) in ICU. The definition of an extended stay in the ICU is generally three to seven days. Factors influencing the prolonged ICU stay were all preoperative, intraoperative, postoperative, medical and non-medical factors included not transferring the patients from ICU to the surgical wards in holidays or weekends, and absence of the beds with monitoring systems and keeping patients in the ICU just due to postoperative atrial fibrillation rhythm (**Almashrafi, Elmontsri & Aylin., 2016**).

As regards to body mass index, the present study clarified that, more than one third of both groups were overweight. These results were in contrast to **Shin et al., (2013)** who stated that, most of the study subjects were obese. This result may be attributed to more than half of the studied patients were above fifty years where the metabolism of the body as well as the mobility is decreasing among old age and decreasing of physical activity due to patients' condition.

The result of the present study revealed that, about one third of studied patients in both groups were received educational information about CABG by health care professional. This goes in line with the finding of **Lie et al., (2012)** who found that, only about half of the patients had received post CABG education and training. This may be due to a variety of factors, including the patients' shorter stays in the hospital, physical and mental effects of CABG, and age-related comorbidities, old ages, that could increase the rate of postoperative complications probably impacts the staff's ability to offer information, guidance and advice.

Concerning patient's knowledge regarding CABG surgery, among control and study groups. The study result showed that, the mean scoring of knowledge at pre implementing discharge plan was not significantly different; the study findings also revealed that, there was a highly significant statistical difference in mean knowledge score between the two groups at discharge and after 3 months' follow-up period. These significant improvements in knowledge indicate effective education being delivered during the intervention. Cardiac rehabilitation has been shown to be effective in modifying lifestyle pattern in a holistic manner based on sound educational theories. Meanwhile, **Zhang et al., (2018)** mentioned that, the planned educational program about post-operative recovery and follow-up care for CABG was an effective intervention to improve of knowledge among CABG patients. This is supported by **Cebeci & Celik., (2015)** who mention that, education will aid CABG surgery patients to make well-informed judgments about change and comply to a healthy lifestyle. **Zerafa, Adamy & Jusife., (2011)** demonstrated that, suitable discharge planning based on in-depth knowledge of the post-discharge experience can help to ensuring optimal recovery and improve patients' awareness.

In relation to post-operative symptoms' severity, among control and study groups. The present study revealed that the mean scores of post-operative symptoms severity experienced by the studied patients, there were no statistical significant difference between both groups at discharge. There were statistical significant differences only in some symptoms as (chest/leg pain, anxiety, sleep troubles, anorexia, fatigue, shortness of breath, and depression) between both groups post one month follow up and post three months' follow-up there were improved in symptoms experienced with statistical significant difference between both groups. This may be related to the effect of discharge plan instructions, which played an important and vital role in such improvement.

This finding is in agreement with **Cebeci & Celik., (2015)** who founded that, post discharge follow-up assessments showed that more than half of patients in the control group experienced of various post CABG

problems such as, loss of appetite, weakness, fatigue introversion, respiratory problems, insomnia, back pain, chest pain, and shoulder pain. However, in the intervention group, half of patients reported only chest pain. At the third evaluation time point, i.e., six weeks following discharge, only twelve percent of the problems had been resolved for the patient in the control group. Meanwhile, this rate in the intervention group was as high, as more than three-quarter of the problems had been resolved.

Regarding self-care ability, among control and study groups. The finding of present study showed that there was a statistically significant in the overall mean scores of self-care ability between the two groups post one and three months' follow-up. This finding consistent with **Rushton et al., (2017)** who added that, the mean self-care score for patients who underwent a CABG surgery was moderate. Therefore, discharge training and counseling services have a positive effect on self-care, reducing the problems and re-hospitalizations that the patients can experience after returning home. Also, Post-CABG care units are recommended to use. Furthermore, **Mansin., (2017)** stated that, mean scores of self-care ability, pre-operative, and pre-discharge knowledge at fifth day postoperative and one month after of the experimental group were significantly higher than those of the control group.

In relation to lipid profile among control and study groups, the result of present study found that there were highly statistically significant differences between study and control groups post one and three months after implementation of discharge plan in all lipid profile variables. This finding correspondent with the finding of **Kubilius et al., (2012)** who reported a successful decrease in Triglycerides (TG), Total cholesterol (TC), and Low-density lipoproteins (LDL) at three months and six months after implementation of complex cardiac rehabilitation program for patient with CADs. Also in the same context **Bikmoradi et al., (2017)** stated that, there were marked improvement in blood lipid values after telephone counseling intervention for patients discharged after CABG surgery. The decrease in lipid levels in this study could be largely

attributed to the medication effect produced by medication adherence, diet adherence and modification of lifestyle behaviors of participants which conserved as a positive outcome of pre-discharge education.

Conclusion:

Based on the findings of the study, it can be concluded that:

The discharge plan instruction was effective in improving knowledge, self-care ability, reducing severity of symptoms as well as all lipid profile finding.

Study recommendation:

- 1- Patient undergoing CABG surgery should be instructed to follow discharge plan and self-care program immediately post operation, as well as during follow up
- 2- Maintain an educational booklet, and boosters that contain all instructions and information about CABG in the cardiothoracic department for nurses and patients.
- 3- Discharge education programs with an interdisciplinary perspective, counseling services, home and follow-up care should be implemented to reduce the problems challenged by these patients.

For further studies:

- In-surface educational program for nurses at Cardiothoracic Surgery Units regarding the impact of pre and post-operative discharge instructions on cardiothoracic patient's quality of life and health related outcomes.

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