

Post-Discharge Problems in Cardiac Surgery Patients

Elizbith Gill^{1*}, Shams Ul Huda², Dr. Farid Ullah Khan³

¹MSc.N, School of Nursing and Midwifery, Pakistan Institute of Medical Sciences, Islamabad, Pakistan

²Nursing Director, Ayub Teaching Hospital, Abbottabad, Pakistan

³Cardiac Surgeon, Pakistan Institute of Medical Sciences, Islamabad, Pakistan

DOI: [10.36348/sjnhc.2023.v06i06.002](https://doi.org/10.36348/sjnhc.2023.v06i06.002)

Received: 18.04.2023 | Accepted: 25.05.2023 | Published: 16.06.2023

*Corresponding author: Elizbith Gill

MSc.N, School of Nursing and Midwifery, Pakistan Institute of Medical Sciences, Islamabad, Pakistan

Abstract

Background: Cardiac surgeries have contributed greatly to resolve the problems relating to Coronary Artery Diseases (CAD) and valvular heart diseases. There are numerous physical and psychosocial problems that cardiac surgery patients experience once they were discharged from the hospital. Purpose: The aim of this study is to determine post-discharge problems and their frequencies in cardiac surgery patients at tertiary care hospital. Methods: Descriptive cross sectional study design was used to determine problems and their frequencies in CABG and valvular surgery in post discharge period. Data was collected from 96 patients through consecutive sampling technique at Cardiac Center of public tertiary care hospital during July to September 2018 on patient's first follow-up after discharge. The questionnaire content validity index was checked by cardiac surgery experts and calculated 0.88. The data was analyzed on SPSS (23 version).descriptive statistical tests frequency, percentage used for categorical variables, and mean and standard deviation for continuous variables and Likert scale for post-discharge problems in cardiac surgery patients. Results: Male patients were high in percentage (71.9%) with mean age of 52 year had CAD due to stress and sedentary life. CABG was done for (80.3) and valvular surgeries done for (19.8%). Pain in the surgical wound site and different body parts, chest wound problems like discharge and swelling. Other problems were difficulty in breathing and pain with cough. Psychosocial problems were found in more than half of the patients like difficulty in sleeping, phobia of body movement and losing job, palpitation and apprehension, sadness and avoided social interaction with others. Conclusion: The study found different problems such as pain, difficulty in breathing, sleepiness, tiredness, difficulty in performing Activities of daily livings and wound related issues. Significant number of participants reported about social isolation, anxiety, restlessness and fear. The findings of current study can be utilized to develop a discharge package for patients.

Keywords: Cardiac surgery, post-discharge problems, patients in cardiac center.

Copyright © 2023 The Author(s): This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY-NC 4.0) which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited.

INTRODUCTION

Background

Cardiovascular Diseases (CVDs) are known to have affected many people worldwide. According to the statistics of World Health Organization (WHO), only in 2015, around 17.7 million people died due to CVDs, and it accounts for 31% of the overall deaths in the world (WHO, 2018). Mostly, this data has affected population from the lower and middle-income countries. The mortality rate in South East Asian region is reported to be increased between years 2000-2012, by 1.8 million, ranging from 6.7 million to 8.5 million (WHO, 2014). The American Heart Association stated in a report that the surveillance of cardiovascular diseases makes manifestation of the fact that almost 85.6 million American adults have suffered from

cardiac problems during 2013("Heart Disease Statistics & Facts", 2018; Nishimura *et al.*, 2017)

The second common cardiovascular disease after coronary artery disease is aortic valve calcification. On one hand, this disease has affected an older population of 2% -10 % in the Western region (Osnabrugge *et al.*, 2013) while on the other, rheumatic and infective heart diseases are considered to be some of the common and leading causes of disabilities and premature deaths in the developing countries. In 2011, an amount of \$ 88.7 billion was spent on CVDs management (Nishimura *et al.*, 2017).

Moreover, the complications connected with Coronary Artery Disease (CAD) often lead the patient to atherosclerotic condition. This condition either slows

down or even stops the blood supply to the cardiac muscles leading to heart attack and Angina. The usual management of CADs is Percutaneous Coronary Intervention (PCI) or Coronary Angioplasty. However, in case of complete and multiple blockages, the Coronary Artery Bypass Grafting (CABG) is equitable (NHLBI, 2014).

Recently, the need for cardiac surgeries is known to be grown in the South Asian countries including Pakistan, India, Bangladesh, Nepal, Maldives, and Sri Lanka. Collectively, 38 thousand cardiac surgeries have been performed, annually, out of which more than twenty thousand cardiac surgeries were performed in Pakistan during the year 2016 (Hosain *et al.*, 2017). The first Coronary Artery Bypass Grafting (CABG) was performed by Canadian missionary Dr. Donald Edward Bowes in 1967-68 at United Christian Hospital Lahore (Hosain *et al.*, 2017). In 1970, a local military surgical team did CABG at Military hospital Rawalpindi. Although patients come from all over the country, the most affected population belongs to Northern areas of Pakistan (Hosain *et al.*, 2016).

Furthermore, cardiac surgeries have contributed greatly to improve cardiac circulation, to alleviate chest pain, and to prevent heart attack, and progress in quality of life (UCSF, 2018). The Post discharge problems can easily be seen in patients with CABG cardiac valve repair, and valve replacement surgery (Medline Plus, 2018). The purpose of these valvar surgeries is mainly to correct the valve structure and to replace the damaged valve in patients having problems like valve insufficiency, valve stenosis; valve prolapsed and valve regurgitation (Ramya & Andrews, 2012).

The Rationale of the study

There are numerous physical and psychosocial problems that cardiac surgery patients experience once they are discharged from the hospital after cardiac surgeries. There is no doubt that, patient's recovery depends on a number of factors including the type of surgery, duration of surgery and post-operative complications (Almasharfi *et al.*, 2016); However, the patients' experience different problems after surgery. Immediately, after CABG and valvular surgeries they are managed in Intensive Care Units (ICUs) and shifted to the post-operative wards once stable, and then sent to home (MacGill & Whitworth 2018; SCAI, 2014). In some cases patients may stay more longer than usual, if they develop complication (MacGill & Whitworth, 2018).

After discharge, the patients experience different problems i.e. incision pain; chest pain (Subeh *et al.*, 2014) poor food intake, activity of daily living (ADL) problems, prolonged recovery period (Parry, *et al.*, 2010) backache, dyspnea, shoulder pain, numbness in upper arms, fatigue (Zimmerman, *et al.*, 2010). In

valvular surgeries problems patients experienced were palpitation, limbs edema and hearing of unusual sounds from the artificial valve (Simon & Molly, 2014). Beside, physical problems the patients also experience psychological problems after discharge i.e. anxiety (Gallagher & McKinley, 2009) and depression (Akbari & Celik, 2015).

Significance of the Study

Limited research has been conducted in Pakistan to identify the problems experienced by post cardiac surgery patients after discharge from the hospital. The findings of this study may be utilized to address those problems through quality discharge teaching. Currently which are experienced by cardiac surgery patients.

Purpose of Study

The purpose of this study is to determine the post-discharge problems and their frequencies in cardiac surgery patients at Cardiac Centre, of a public tertiary care hospital in Islamabad.

Research Questions

1. What are the different post-discharge problems in cardiac surgery patients at Cardiac Centre of public tertiary care hospital in Islamabad, Pakistan?
2. What are the frequencies of problems in post-discharge cardiac surgery patients of the Cardiac Centre of public tertiary care hospital in Islamabad, Pakistan?

REVIEW AND SYNTHESIS OF THE LITERATURE

This chapter presents the theoretical and empirical literature about post-discharge problems in cardiac surgery patients. This review is organized into three sections which are search strategy, types of surgeries and post-discharge problems.

Search Strategy

Keywords/phrases cardiac surgery, patient's problems, cardiac surgery, discharge teaching, postoperative problems were used individually and in combination using different Boolean operators AND, OR, NOT. Article published in English language between 1995- 2018 were retrieved from various internet sources. Quantitative and qualitative study articles relevant to the study topic were included in this literature review. The relevant articles were selected by reviewing abstract and chosen only relevant articles and the rest were discarded. The current relevant literature searched through different electronic Databases such as Google, Scholar, and CINAHL, Pub MED, Medline, HINARI, Science Direct, Science Hub and Research Gate. Additionally, the American Journal of Critical Care Nursing, Journal of Advanced Nursing, Journal of Surgery and Trauma, European Heart Journal, Journal of Nursing Care Quality, Journal of Clinical Nursing, International Journal of Nursing Education, Journal of

Research in Nursing, Health and Patient Education and Counseling Interactive Cardiovascular and Thoracic Surgery were also searched.

Types of Cardiac Surgeries

Coronary Artery Bypass Grafting (CABG) is the type of cardiac surgery that is performed for a patient with completely blocked coronary arteries (Parry *et al.*, 2009; Medline plus, 2018). The benefits of CABG surgeries are not only to improve survival rate, but also to improve ventricular function and to relive angina in CAD. Valvular surgeries are performed to repair and to replace the affected valves (Medline, 2018).

At the present time, patient's length of stay is kept short in the hospital after cardiac surgery, to minimize nosocomial infections, cost of treatment and to make beds availability for the awaiting patients. Patient's early discharge from hospital needs a supporting structure such as general practitioner, nurses, physiotherapist, and rehabilitation in the community to handle postoperative complications (Suzanne *et al.*, 2009). Home is an ideal place for patient's healing and family support as it boosts patient self-esteem (Huisman *et al.*, 2012).

Almost 28% of post cardiac surgery patients requires medical intervention within six to eight weeks during the post-discharge recovery period due to some complications (Litwinowicz *et al.*, 2014). Better results can be achieved by the introduction cardiac rehabilitation (Gallagher *et al.*, 2004; Stocica, *et al.*, 2014).

Post-discharge Problems in Cardiac Surgery Patients

Post discharge problems in cardiac surgery patients which they might experience during the early recovery period at home are documented in literature. They had pain, surgical wound site problems, difficulty in performing activities of daily living (ADLs), care of the surgical incision site, taking medication, difficulty in falling asleep, anorexia, constipation, psychological and social problems (Akbari & Celik, 2015; Gallagher, *et al.*, 2004). Furthermore, They face many problems at home like incision pain, physical activity, intolerance, fatigue, surgical wound care, (Akbari & Celik, 2012; Derik & Celik, 2012; Gallagher, *et al.*, 2004; Parry, *et al.*, 2010). These symptoms occur due to the involvement of many pain-sensitive structures like sternum, leg incisions with the cutting of subcutaneous muscles, bone and visceral tissues as reported by Subeh and Saleh (2014). Pain is major and expected phenomena after surgery. Sleep disturbances occur due to backache, chest pain and leg wound, fear of death, dyspnea and palpitation. These problems keep them awake during night time. They also have social problems like avoidance of visitors and lack of social contacts (Akbari & Celik, 2014).

In addition to the above problems, some studies reported problems like backache, dyspnea, palpitation, constipation, some problems related to self-care like difficulty in taking bath, lying down, tired, hesitate to move and fear of wound bursting as evidenced (Derik & Celik, 2012). The intensity of following problems was less such as tachyarrhythmias, angina, backache, weakness, fatigue, anorexia and leg swelling, and patients were more concerned about getting information for medication, knowledge about disease risk factor, exercise and diet (Jaarsma, *et al.*, 1995). These are the important areas which need to be discussed in detail at the time of discharge from hospital (Jaarsma, *et al.*, 1995). Some research studies highlighted patient's social problems which were social isolation, feel difficulty in social interaction with others, avoid visitors, and no participate in social activities (Akbari & Celik, 2012; Direk & Celik, 2012; Jaarsma, *et al.*, 1995). Social problems which patients experience after surgery were confusing role with family, relationship with spouse, and friends (Derik & Celik, 2012).

Some researchers divided their study findings into two categories that are avoidable and unavoidable post cardiac surgery problems during home care (Efthymiou & O'Regan, 2011). The avoidable problems were wound infections (in sternum and leg), arrhythmias, hypotension, ulnar nerve palsy, constipation, headache, and hematoma formation. The unavoidable problems are atrial fibrillation (AF), pneumonia and respiratory distress due to pleural effusion. In such case they need to be admitted into the hospital. There should be a structured questionnaire to assess and record post-discharge problems for future learning and improvement (Efthymiou & O'Regan, 2011). In both avoidable and unavoidable problems, patients need appropriate knowledge for the identification of problems and seek medical aid in unavoidable conditions.

Besides physical and social problems, post cardiac surgery patients also suffers from psychological problems that are sleeplessness and anxiety during the first month of recovery (Gallagher, *et al.*, 2004; Parry, *et al.*, 2010) mentioned as sadness, helplessness, fear of death and sexual problems reported in their studies (Derik & Celik, 2012). Some patients had nervousness, insomnia, attention deficit and sexual problems (Gallagher, McKinly & Dracup, 2004; Parry *et al.* 2010; Subeh, Salami & Saleh, 2014). The study findings by Tully (2012) suggested that 30% to 40% of CABG surgery patients experience depression immediately leading up to and after surgery. Emotional reaction were found in 23% patients such as depression, anxiety, fear of movement and insomnia (Jaarsma, *et al.*, 1995). The psychological symptoms of anxiety and depression frequency was high as reported in various studies (Akbari & Celik, 2012; Derik & Celik, 2012;

Doering, *et al.*, 2002). On the other hand, the frequencies of these problems were less reported in some studies (Gallagher & McKinley, 2009). Some other studies reported both problems such as anxiety and depression but on different levels. There were patients whose anxiety level was high and depression level was low in post CABG surgery patients (Derik & Celik, 2012; Subeh, Salami & Saleh, 2014). However, some patients may develop a depression symptom during recovery from surgery (Baker, 2012). Thus, it may delay improvement in cardiac functioning (Tully & Baker, 2012). Valvar heart disease patients experience palpitation, edema, unusual sounds from the valve and sleeplessness (Simon & Molly, 2014).

RESEARCH METHODOLOGY

This chapter comprises the study design, study population and setting, sample strategies, eligibility criteria and ethical considerations. Data collection tool, data collection procedure, and data analysis (What? Procedure?) are also a part of this chapter.

Study design

The descriptive cross-sectional study was conducted to determine post-discharge problems and their frequencies in cardiac surgery patients within four weeks of their discharge. This study has been done in Post-cardiac surgery patients. Descriptive design was an effective study design to assess one point in time post-discharge problems related to cardiac surgeries (Polit & Beck, 2012).

Study Setting

The Study was conducted in Pakistan Institute of Medical Sciences (PIMS) a tertiary care public hospital situated in Islamabad. The hospital comprised of 1150 beds with five specialized divisions sub-hospitals, one of them is Cardiac Centre of PIMS, Islamabad. The Cardiac Centre of PIMS is one of the specialized units that provides services to cardiac patients and is well equipped with 109 beds with all the facilities required for interventional cardiology and open-heart surgeries. It has Cardiac Surgery Intensive Care Unit (CSICU), Coronary Care Unit (CCU), Post Cardiac Surgery Unit, Emergency Department (ED), OPD, and Operation Theater that performs 30-35 surgeries per month. Almost 400 patients visit OPD on daily basis.

Study Population

The accessible population chosen for the study was patients who had undergone CABG, valvular repair and replacement surgeries.

Sample Size

The sample size was calculated using WHO sample size formula for descriptive studies using the value of 95% confidence interval, prevalence of 50%, and precision of 10%. The calculated sample size was

96, 10% was added for non-respondent and the resultant sample size was 106.

$$\text{Formula} = (1.96)^2(0.5)(0.5)/(0.1)^2$$

Sampling Strategy

The consecutive sampling technique was used to recruit post CABG, valve repair and replacement surgery patients from an accessible population. The eligibility criterion was set according to the patients' first follow up within one month after discharge from the hospital. The participants who met the eligibility criteria over a specific time interval from July 2018 to September 2018(See Appendix: A) were included in the specified sample size.

Eligibility criteria

Inclusion criteria

Adult patients:

1. With post-cardiac surgery including CABG, valve repair and valve replacement.
2. Cardiac surgery post-discharge patients on their first follow up in an outpatient department (OPD) within one month after discharge from the hospital.
3. Who could read and write Urdu
4. Who gave written consent for participation in the study

Exclusion criteria

The patients:

1. Who were hemodynamically unstable and with congenital cardiac surgery

Data Collection Tool

The literature were reviewed for tools to measure post-discharge problems in cardiac surgery patients. A tool was adapted, and permission was granted from the principal investigator (See Appendix: B).The content validity was established in our context by a panel of five experts consisting of two cardiac surgeons and three experienced cardiac nurses (0.88).

Section-A of the questionnaire contain demographic details and Section-B consist of post discharge problems in cardiac surgery patients. Post discharge problems were assessed on 5- point Likert Scale (1= No, 2=often, 3= very often, 4= frequent, and 5=continuous). Demographic section included admission, operation and discharge dates, age, gender, marital status, and number of children, education level, the source of income, residential area and pattern of exercise. Moreover, Section- A included information regarding provision of discharge summary and its satisfaction. Section-B comprised problems experienced by patients during discharge period. Section-B also contained post-discharge complications of cardiac surgery patients. In Section-B, questions 1-10 were related to breathing difficulties, post-surgery pain location in the body, pain intensity and the measures taken for pain management. Furthermore, it had problems related to surgical site wound in the chest and

leg and any wound discharge and its color. Questions 11-15 were related to valve repair and replacement. Questions 16-40 contained general information of both types of cardiac surgery patients, type of food intake, problems of dietary intake and, elimination problems. It also had questions about psychological problems. Participants were asked to state problems other than those which were not a part of the questionnaire.

Data Collection Procedure

Data was collected through a self-administered questionnaire (See Appendix: C) that was translated in local language (Urdu). Patient who fulfilled the eligibility criteria were selected at the OPD level when they were on their first follow up visit after discharge. Patient counseling room was utilized for data collection. An informed consent (See Appendix:D) was taken from patient and their family members. The demographic data section related to disease information was completed by researcher through utilization of patient discharge prescription. Post-discharged problems related to cardiac surgeries were completed by the patients themselves. Data collection forms were checked for their completeness at the same time.

Data Analysis

The data analysis was done on the Statistical Package for Social Sciences (SPSS) Version -20. Descriptive analysis such as frequencies and percentages were used for categorical responses. In addition, for quantitative variables such as age and number of children, mean and the standard deviation were calculated.

Ethical considerations

This study was approved (See Appendix: E) from the Institutional Review Board and Ethical Committee (IRB & EC) of Shifa International Hospital (IRB letter #1051-326-2018). Furthermore, permission for data collection from PIMS Hospital was taken (See Appendix: F). A written description of the study and consent form was given to the participants and potential harms as well as benefits were explained to the participants. The participants had the right to withdraw from study at any time. They were not rewarded in any form for their participation. A numeric code was assigned to each data form during data collection to maintain the participants' anonymity and

confidentiality. A password was used to secure the soft files related to the data information and all the forms were under the custody of researcher's personal locker. Only researcher and the supervisors had access to data.

Summary of the chapter

The chapter focused on the research methodologies that were utilized to conduct the study. A quantitative approach was followed. Measures related to data collection, its procedure and sampling strategies were discussed. Lastly, all the measures considered for ethical issues were described.

FINDINGS

This chapter presents the study findings. Post-discharge problems as well as their frequencies are described in tables. The overall results consist of demographic characteristics of the patients and the problems and post-discharge problems after cardiac surgery.

The findings in Table I shows, that the majority of the participants were males 69(71.9%), the mean age was 52 years, 87(90.6 %) married and mean of number children was 4 (±2.4). In one third of patients 32 (33.3%) had middle level education. The ration of patients living in rural (50%) and urban area (50%) were the same. One quarter of the population had private job 24(25%)and personal business 24 (25%). The majority of the patient (68.8%) were hypertensive, 35.40% patients had high cholesterol, 22.90% were diabetic, 20.80% were smokers and 79.2% never exercised before their surgery. The majority patients (79.20%) were diagnosed with double and triple vessel coronary artery disease (DV/TV CAD) and 19.80% were diagnosed with Mitral valve stenosis, aortic valve stenosis and prolapsed. Mitral valve stenosis, aortic valve stenosis and prolapsed, 10 of them (10.40%) had Ischemic Heart Disease (IHD) and 2(2.10%) had Myocardial Infarction (MI) other problems they had Rheumatic Heart Disease and Pulmonary hypertension. Furthermore,74% of the patients had CABG surgery, 18 of them (18.8%) had valve surgery. Additionally, 93 of the patients (96.9%) responded that they felt better after surgery. All the patients received discharge teaching and 92 of them (95.8%) were satisfied from their discharge teaching instructions.

Table 1: Demographic Data of Categorical Variables (n-96)

Variables Name	Frequency	Percentage
Gender		
Male	69	71.9%
Female	27	28.1%
Residential area		
Urban	48	50%
Rural	48	50%
Exercise regularly		
Yes	20	20.8%
No	76	79.2%

Variables Name	Frequency	Percentage
Hypertension		
Yes	66	68.8%
No	30	31.3%
Diabetes Mellitus		
Yes	22	22.90%
No	74	77.10 %
Smoking		
Yes	20	20.80%
No	76	79.20%
High Cholesterol Level		
Yes	34	35.40%
No	62	64.60%
DV/TV. CAD		
Yes	76	79.20%
No	20	20.80%
Myocardial Infarction (MI)		
Yes	2	2.10%
No	94	97.90%
Ischemic Heart Disease (IHD)		
Yes	10	10.40%
No	86	89.60%
Valve stenosis/ prolapsed		
Yes	19	19.80%
No	77	80.20%
Feel better after surgery		
Yes	93	96.90%
No	3	3.10%
Received discharge teaching		
Yes	96	100%
No	0	0%
Satisfied with discharge teaching		
Yes	92	95.80%
No	4	4.2%

Description of continuous variables is given in table 2.

Table 2: Descriptive Analysis of Continuous Variables (n=96)

Variable Name	Mean	SD ±	Range	Minimum	Maximum
Age	52.44	13.29	60	18	78
Number Of Children	4	2.4	11	0	11
Admission to discharge	9.11	2.81	16	4	20
Post-surgery till discharge	6.54	2.00	10	3	13
Pre surgery	2.57	2.20	14	1	15

Results related to post-discharge problems of cardiac surgery patients are presented in table 3.

Table 3: Post-Discharge Problems Related to Cardiac Surgery (n=96)

Variable Name	Post Discharge Problems	How often or frequent is the problem				
	Yes (Frequencies)	Percentage (%)	Often (%)	Very often (%)	Frequent (%)	Continuous (%)
Respiratory Problem						
Breathing difficulty	66	69%	82%	15%	2%	2%
Post-surgery Pain and its Location and measures to reduce						
Pain	87	91%	74%	18%	6%	2%
Pain with cough and breathing	59	72%	64%	22%	7%	7%
Pain in sternum	60	63%	72%	25%	3%	--
Pain in chest	57	59%	67%	23%	8%	3%

Variable Name	Post Discharge Problems	How often or frequent is the problem				
	Yes (Frequencies)	Percentage (%)	Often (%)	Very often (%)	Frequent (%)	Continuous (%)
Pain in shoulder	66	69%	47%	43%	7%	3%
Pain Right Leg	86	90%	10%	60%	10%	20%
Pain in Left leg	58	60%	32%	5%	3%	8%
Backache	70	73%	39%	46%	8%	4%
Measures for pain Rest	40	42%	32%	52%	5%	11%
Take Pain medication	21	22%	27%	55%	5%	13%
Consult with Dr for pain	84	88%	33%	67%	--	--
Surgical Wounds Problems						
Problem in chest wound	67	70%	76%	14%	3%	7%
Problem in leg wound	60	63%	69%	6%	3%	17%
Wound discharge	67	70%	72%	7%	3%	17%
Post Valvular Problems						
Bleeding from gums	8	8%	9%	1%	--	1%
Bleeding from urethra	1	2%	2%	--	--	--
Bleeding from rectum	1	2%	0%	2%	--	--
Heavy menstruation	1	2%	2%	0%	--	--
Hear sound from artificial valve	17	21%	10%	10%	--	1%
One sided weakness	9	12%	3%	7%	--	3%
Edema hands and feet	21	22%	21%	3%	3%	1%
Avoid green leafy vegetables and organ meat	24	27%	2%	9%	2%	14%
Gastro Intestinal Problems						
Loss of appetite	76	79%	38%	38%	4%	20%
Avoid fat diet after CABG	75	78%	11%	25%	8%	50%
Food you take white meat	47	51%	9%	40%	6%	45%
Vegetables and fruits	91	95%	4%	34%	8%	54%
Juices	35	37%	3%	31%	3%	63%
Glucose level under control	38	40%	13%	17%	2%	13%
Excessive thirst	60	63%	39%	34%	16%	8%
Diarrhoea	12	13%	69%	23%	0%	0%
Constipation	44	46%	73%	14%	2%	11%
Post-Operative Activities						
Perform activities of daily livings (ADLs)	52	54%	79%	15%	6%	0%
Difficulty in performing (ADLs)	79	82%	53%	29%	6%	11%
Assistance for washroom	78	81%	58%	31%	5%	6%
Bath after surgery	76	79%	65%	25%	7%	4%
Walk after surgery	96	100%	39%	37%	4%	21%
Psychological Problems						
Fear of movement	48	50%	79%	17%	2%	2%
Difficulty in sleeping	63	66%	56%	28%	5%	9%
Take medicine for sleep	20	21%	60%	25%	5%	10%
Fear of losing job	18	19%	22%	19%	3%	6%
Worried for help from others	35	37%	53%	25%	8%	11%
Feel tired	90	94%	39%	39%	6%	17%
Palpitation and apprehension	52	54%	81%	10%	4%	4%
Feel Sad	62	65%	63%	26%	7%	5%
Medications						
Take medication regularly	95	99%	3%	4%	4%	88%
Social problems						
Avoid social contacts with others	7	7%	14%	57%	14%	14%
Other problems						
Other than these problems	24	25%	46%	21%	17%	17%

*Post Valvular problem not applicable for CABG patients

The percentage of patients with breathing difficulty was 66 % where as 59% of the patients had pain with cough. In addition, 87% of the patients responded that the pain intensity was as 7% severe, 37% moderate and 52% had mild pain. Pain locations in the body including sternum, chest, and shoulder ranged between 59% to 72 %. Pain in both legs and back was between 39 % to 60%. Patients took measures for pain relieve as 40 % of them took rest, 21% of them took pain medication and, 84% of the patients consulted doctors for pain.

The surgical wound chest site problems was almost 67%, the leg wound was around 60% where as 67% of the patients had wound discharge. Moreover, patients after valve replacement took anticoagulant therapy to keep their blood thin due to this therapy, they might have bleeding from different body orifices. The study found out that 8.3 % of the patients had bleeding from gums. In 17% of the cases, the patients also experienced sound coming from artificial valve. It is equally important to assess loss of appetite in post-surgery patients (79.1%) suffered from this problem. Post CABG surgery avoids fat diet and 78.1% of the patients were doing this practice. Patients had experienced excessive thirst (62.5%), and constipation (45.8%).

Although 54.2% of the patients performed ADLs, 82.3% faced difficulty for ADLs and 81.3% of them needed assistance. 79.2% of the patients took bath after surgery patients where as all of them walked after surgery on different frequencies. As far as psychological problems are concerned, 50 % of them were afraid of movement. Difficulty in falling asleep was faced by 65.6 % of the patients and 20.8% took medication for sleep. All the participants shared that their sleeping hours were different after surgery as 67 (71.2%) had 2-4 hours 8 (8.5%) sleep for 5-8 and 6(6.3%) 8-12 hours. The symptoms of anxiety like palpitation and apprehension were reported by 54.2%. Only 7% patients avoided social contacts with others and feelings of sadness were experienced by 64.6% patients.

When patients were asked for problems other than these 28.2% patients reported physiological and social problems. The physiological problems were related to surgical wound reported by 5% patients left leg swelling, had a urinary catheter, enlarge prostate, leg wound itching, and 2% patients had fever. Most of the patients reported single and different problems like anger and over thinking on other matters, chest heaviness and numbness, chest wound tightness, dependence on other for sitting and standing, heart movements towards right side of the chest, heavy-headedness, nausea, doctor did not give proper time and advise, numbness in upper part of leg, pain in right side of the body, snoring, weight loss of 16 kg. Only 3% of

them reported social problems like poverty, medicine availability, and family property issues.

DISCUSSION

In this chapter, findings of this study are compared with other studies. Other than that, findings, study strengths, limitations, implications and recommendations are also given at the end.

The purpose of this research was to identify the problems experienced by CABG and valvular surgery patients, after their discharge from the hospital. The study findings showed that most of the study participants were male and the mean age was 52 years. A quarter of them were the sole bread winners of their families doing private jobs. It is more likely that cardiac surgery at this age may have led to stress in their lives. The reasons for cardiac issues at the age of fifties in our population could be sedentary lifestyles and high cholesterol diet.

These findings were affirmed by National Heart, Lung and Blood Institute (2018), the study mentioned that the risk of getting CAD increases in the women at the age of 55 and in men at the age of 45 and it is more common in men. Other risk factors include family history, hypertension, high cholesterol levels, smoking, diabetes, ethnicity, obesity and lack of physical activity. A study conducted in Kerala, South India found out that sedentary lifestyle and high cholesterol level in their study participants and developed cardio vascular diseases. (Krishnan *et al*, 2016). Coronary Artery Disease (CAD) risk factors can be divided into two unchangeable risk factors that are age and genetics whereas changeable risk factors are smoking, obesity and psychosocial factors (Khayyam-Nekouei, *et al.*, 2013).

A review done by Cohen, Edmondson & Kronish (2015) opposed the study risk factors mentioned above. According to them other risk factors such as behavioral and biological mechanisms and suggested association between behavioral factors with depression influence the cardiac problems more. Patients with depression have a low mood, less physical activity, smoking and reduced compliance with cardiac medication express poor prognosis.

This study finding discovered that, prolonged stay of the post-cardiac surgery patients in the hospital from admission to discharge had a mean of 9.11 days, post-surgery till discharge mean was 6.54 days and pre-surgery mean 2.57 days. In our scenario pre-surgery LOS in the hospital was related to anesthesia fitness issues of patients with abnormal renal functions and hospital-acquired chest infections after admission. These patients belonged to the deprived areas of Pakistan (northern areas). If such patients are diagnosed with the cardiac disease and are suggested a surgery,

they seldom come back because of the financial situation and lack of funds availability for the surgery.

On the other hand, the shortage or unavailability of anesthesia and nursing staff might sometime lead to unplanned postponement of operation. The health work force crises situation of Pakistan in 2013-2014 reported that required nurses were 1,360,000 for (170 million population) but nurses' shortfall was 1,304,835 as compare to doctors short fall which was 179,711 (Economic Survey 2013-2014). Another shortage report (Asma, 2012) on nurses indicated that according to WHO statistics International standards for doctor and nurse the ratio was 1: 3 but here in Pakistan situation is opposite. In Europe 4.2 nurses for one doctor were available and in Pakistan 4.5 doctor for one nurse are available and this scenario is so critical that patient care in compromised. Amongst Post-surgery prolonged LOS, the most contributing factors were valve surgery (valve + CABG) combine surgery, post-operative complications like bleeding, shock, pneumonia, acute renal failure. In the last decades, post cardiac surgery patients stayed 8 days in the hospital (Gallagher, *et al.*, 2004).

Patient's LOS in the hospital after cardiac surgery depends on the type of surgery and their needs. In a study conducted by MacGill and Whitworth (2018), Post CABG patients' total stay was 4-10 days in the hospital. They stayed at least one day in the intensive care unit and remaining days in the cardiac surgery ward. Similarly, in a study done in Oman (Almashrafi, *et al.*, (2016). post-cardiac surgery patients were discharged from hospital in 6 to 10 days of surgery as reported by Fairview (2018) commented on LOS period may be as short as 3-4 days and long for weeks if complications develop. They also emphasized that open heart surgery is a major operation that requires a hospital stay of a week or more.

In this study, two third patients experienced difficulty in breathing. These finding are in consistence with other studies (Akbari & Celik, 2015; Bennister & Kindell, 2016; Cebeci & Celik, 2008; Derik & Celik, 2012). It could be predicted that all major surgeries are mainly done under general anesthesia and patients may develop chest infections in known smoker patients. Chest physiotherapy and deep breathing exercises played vital role in minimize these problems. In our context, minimal rehabilitative services and shortage of nurses in the hospital may affect this problem.

In this study most of the patients suffered from pain after cardiac surgery in different parts of the body like sternum, chest, shoulder, pain in both legs, backache. Pain intensity was mild to severe. They also felt pain during cough and breathing. These problems were in consistence with (Derik & Celik 2012), intense shoulder pain and backache reported by study control group (Cebeci & Celik 2007). An other interventional

study pointed out problems like backache, shoulder pain, numbness in upper arms (Zimmerman, *et al.*, 2010).

Studies conducted by Cebeci & Celik (2007) and Akbari & Celik (2015) mentioned that Post-operative pain sources are surgical injury to the peripheral nerves. In cardiac surgeries thoracotomy pain persists due to intercostals nerve damage by the drainage tubes and sternal wires. This pain is felt in chest and shoulders as well. After surgery in the hospital during first post-operative days pain is controlled with opioids drugs (Gemer, 2008). Post-operative uncontrolled pain may delay patient's recovery and quality of life. It is important to control surgical pain as well as reduce opioids tolerance by the use of Paracetamol and Non-steroidal anti-inflammatory drugs (NSAIDS).

This study identified psychological problems in post CABG and valvular surgery patients. Two third of patients had feelings of sadness and sleep difficulties more than one third of patients who had sleep of two to five hours only. One fifth of Patients with sleep disturbances were on sleep medication. More than fifty percent patients had anxiety symptoms like palpitation and apprehension. Post cardiac surgery patients had phobias, half of the patients had kineto phobia and one third had phobia of losing job and worried about help from others. These problems were supported studies (Derik & Celik, 2012) stating that mostly patients had sleep disturbances and palpitations. Insomnia was reported in study of (Cebeci & Celik 2007; Muller *et al.*, 2017).

More than half of the participants had emotional reactions (Jaarsma *et al.*, 1995). Sleep disturbances may be due to surgical wound pain, backache ,valvular surgery patients hear sound from artificial valve and palpitation after valve replacement. Hospital environment may cause sleep disturbances due to noise of medical equipment like cardiac monitors, change of environment, being away from family and lack of reassurance. Cardiac surgery is an expensive intervention in the private and public sector hospitals. Patients and their families bear surgery expenses and become financially down and seek help from others.

This study finding addressed problems after CABG and valvular surgery nearly all patients suffered from tiredness, more than two third had difficulty in performing activities of daily living and needed assistance for wash room. These findings were consistent with (Akbari & Celik, 2015; Derik & Celik, 2012). Patients with tiredness have more intense feeling of pain (Muller at el., 2017). In addition to patient's sedentary life style, unhealthy eating habits and stressors also lead to cardiac problem. In our culture female patients have more anxiety for operations as inferred by Jafar & Khan (2009). Furthermore, after

cardiac surgery patients are afraid of chest wound bursting because of that they avoid walk. In the early recovery period patients could not perform their activities of daily living (ADLs) and require assistance for bathroom as highlighted in several studies (Derik & Celik, 2012; Cebeci & Celik, 2008; Akbari & Celik, 2014; Jaarsma *et al.*, 1995).

Other problems depicted in this study were related to surgical site wounds. Post cardiac surgery patients have sternal wound and leg wound. Patients had discharge in the form water and pus from these wounds on their first follow up one week after discharge, Patients reported heaviness in the chest. The other problems were in the leg incision had tightness, swelling and itching as wound was getting dry. Surgical wound healing takes four to six weeks assented by (Cebeci & Celik 2008; Derik & Celik, 2012). Moreover, after cardiac surgery wound healing is an important part of patients' recovery. Patients and family discharge teaching for home care includes how to clean the wound, what to use or avoid, type of dressing, signs of improvement and signs of infection. Discharge teaching given for upper limbs movement patients' poor compliance leads to chest infections and complications. Expertise in this specialized field of surgery required from start to the end. Teaching of home care for surgical wound should be done by nurses before discharge with the use of different teaching aids like demonstration.

Limitation of the study

- Convenience sampling strategy
- Only in one setting
- Limited time

Strength of the study

- First study on the topic as per author limited knowledge
- Participants from different ethnic backgrounds

Implications of the study

1. Cardiac center administration should strengthen rehabilitation department.
2. Cardiac nurses should develop booklet for discharge teachings.
3. Use videos for patients and family members for self-care trainings
4. Cardiac patients training and counseling for exercise
5. Life style modification for a healthy heart

Recommendation

Practice

1. Develop strategies to decrease patient's length of stay in the hospital.
2. Discharge teaching on surgical wound care for home
3. Pain management can be taught and done through non-pharmacological methods.

Future Research

1. Development of discharge teaching package on the base of study findings.
2. Interventional study on effectiveness of discharge teaching in cardiac surgery patients

REFERENCES

- Abdullah, M. A., Mukhtar, F., Wazir, S., Gilani, I., Gorar, Z., & Shaikh, B. T. (2014). The health workforce crisis in Pakistan: a critical review and the way forward. *World Health Popul*, 15(3), 4-12.
- Akbari, M., & Celik, S. S. (2015). The effects of discharge training and counseling on post-discharge problems in patients undergoing coronary artery bypass graft surgery. *Iranian journal of nursing and midwifery research*, 20(4), 442.
- Almashrafi, A., Alsabti, H., Mukaddirov, M., Balan, B., & Aylin, P. (2016). Factors associated with prolonged length of stay following cardiac surgery in a major referral hospital in Oman: a retrospective observational study. *BMJ open*, 6(6), e010764.
- Amirabadi, T., Nasiri, A., Kazemi, T., & Kardan, M. (2014). Educational needs of patients with heart valve replacement surgery in birjand, 2012. *نشریه جراحی و تروما*, 2(2), 52-58.
- Bannister, C. (2018). Side-Effects and Complications of Heart Surgery. Retrieved from <https://www.ctsnet.org/article/side-effects-and-complications-heart-surgery>
- Cebeci, F., & Celik, S. S. (2011). Effects of discharge teaching and counselling on anxiety and depression level of CABG patients. *Turkish J Thorac Cardiovasc Surg*, 19(2), 170-6.
- Cohen, B. E., Edmondson, D., & Kronish, I. M. (2015). State of the art review: depression, stress, anxiety, and cardiovascular disease. *American journal of hypertension*, 28(11), 1295-1302.
- Coronary Artery Bypass Grafting | National Heart, Lung, and Blood Institute (NHLBI). (2018). Retrieved from <https://www.nhlbi.nih.gov/health-topics/coronary-artery-bypass-grafting>
- Direk, F., Celik, S. S., & Lefkoşa, K. K. T. (2012). Postoperative problems experienced by patients undergoing coronary artery bypass graft surgery and their self-care ability after discharge. *Turkish J Thorac Cardiovasc Surg*, 20(3), 530-5.
- Direk, F., & Celik, S. S. (2012). Post operative problems experienced by patients undergoing coronary artery bypass graft surgery and their self-care ability after discharge. *Dergisi*, 20(3), 530-535.
- Doering, L. V., McGuire, A. W., & Rourke, D. (2002). Recovering from cardiac surgery: education on recovery following coronary artery bypass surgery. *Am J Crit Care*, 11(4), 333-43.
- Efthymiou, C. A., & O'Regan, D. J. (2011). Institutional report - Cardiopulmonary bypass: Post

discharge complications: what exactly happens when the patient goes home? *Interactive Cardio Vascular and Thoracic Surgery* 12 ,130–134.

- Fa, J. (2009). Frequency of preoperative anxiety in Pakistani surgical patients. *J.PakMed assoc* 59(6), 359-63.
- Gallagher, R., & McKinley, S. (2009). Anxiety, depression and perceived control in patients having coronary artery bypass grafts. *Journal of advanced nursing*, 65(11), 2386- 2396.
- Gallagher, R., McKinly, S., & Dracup, K. (2004). Post-discharge problems in woman recovering from coronary artery bypass grafting. *Australian Critical Care*, 17(4), 160-165.
- Gerner, P. (2008). Post-thoracotomy Pain Management Problems. *AnesthesiolClin* 26(2), 355–vii.
- Hosain, N., Amin, F., Rehman, S., & Koirala, B. (2017). Know thy Neighbors: The status of cardiac surgery in the South Asian countries around India. *Indian Heart Journal*, 69(6), 790-796.
- Huisman, E. R. C. M. E., Morales B, J., Hoofa, V., & Kort, H.S.M., (2012). Healing environment: A review of the impact of physical environmental factors on users *Building and Environment*, 58 (2012),70-80.
- Jaarsma, T., Kastermans, M., Dassen, T., & Philipsen, H. (1995). Problems of cardiac patients in early recovery. *Journal of Advanced Nursing*, 21(1), 21-27.
- Khayyam-Nekouei, Z., Neshatdoost, H., Yousefy, A., Sadeghi, M., & Manshaee, G.(2013) Psychological factors and coronary heart disease. *ARYAtheroscle,r* 9(1), 102-11
- Krishnan, M., Zachariah, G., Venugopal, K., Mohanan, P., Harikrishnan, S., & Sanjay, G. (2016). Prevalence of coronary artery disease and its risk factors in Kerala, South India: a community-based cross-sectional study. *BMC Cardiovascular Disorders*, 16(1).
- Litwinowicz, R., Bartus, K., Drwila, R., Kapelak, B., Konstanty-Kalandyck, J., & Sobczynski, R. (2015). In-Hospital Mortality in Cardiac Surgery Patients After Readmission to the Intensive Care Unit: A Single-Center Experience with 10,992 Patients. *Journal Of Cardiothoracic And Vascular Anesthesia*, 29(3), 570-575.
- MacGill, M., Whitworth, G. (2018). What should I expect during open heart surgery? Retrieved from <https://www.medicalnewstoday.com/articles/312888.php> Retrieved from <https://www.fairview.org/patient-education/40520>
- Merkouris, A., Apostolakis, E., Pistolas, D., Papagiannaki, V., Diakomopoulou, E., & Patiraki, E. (2009). Quality of life after coronary artery bypass graft surgery in the elderly. *European Journal of Cardiovascular Nursing*, 8(1), 74-81.
- Muller, A.G., Alves, D., Antonio, De Freitas., Da Cruz, D., Monteiro, Gengo, Almeida Lopes, R.C., & Silva, E. (2017). Characteristics of fatigue after coronary artery bypass grafting. *European Heart Journal*, 38(1),1.
- Myles, P. S. (2014). Meaningful Outcome Measures in Cardiac Surgery. *J Extra Corpor Technol*, 46(1): 23–27.
- Nishimura, R., Otto, C., Bonow, R., Carabello, B., Erwin, J., & Fleisher, L. (2017). 2017 AHA/ACC Focused Update of the 2014 AHA/ACC Guideline for the Management of Patients WithValvular Heart Disease. *Journal Of The American College Of Cardiology*, 70(2), 252-289.
- Osnabrugge, R. L., Mylotte, D., Head, S. J., Van Mieghem, N. M., Nkomo, V. T., LeReun, C. M., ... & Kappetein, A. P. (2013). Aortic stenosis in the elderly: disease prevalence and number of candidates for transcatheter aortic valve replacement: a meta-analysis and modeling study. *Journal of the American College of Cardiology*, 62(11), 1002-1012.
- Parry, M., Watt-Watson, J., Hodnett, E., Tranmer, J., Dennis C.L., & Brooks, D. (2009). Cardiac home education and support trial (chest): a pilot study *Can J Cardio*, 25 (12). e397
- Parry, M., Watt-Watson, J., Hodnett, E., Tranmer, J., Dennis, CL., & Brooks, D. (2010). pain experiences of Men and Women after Coronary Artery Bypass Graft Surgery. *Journal ofCardiovascular Nursing* , 25 (3). E9 - E15.
- Parveen, S. (2016). Acute shortage of nurses in Pakistan. *South American Journal of Nursing* (special Edition), 1-6.
- Polit, D. F., & Beck, C. T. (2012). *Nursing research: Generating and assessing evidence for nursing practice*.
- Ramya, K., & Andrews, G. (2012). Effectiveness of discharge counseling on compliance and relation between quality of recovery in hospital and quality of life at 3 months after cardiac surgery. *Anesthesiology: The Journal of the American Society of Anesthesiologists*, 95(4), 862-867.
- Samiei, N., Hakimi, M. R., Mirmesdagh, Y., Peighambari, M. M., Alizadeh-Ghavidel, A., & Hosseini, S. (2014). Surgical outcomes of heart valves replacement: A study of tertiary specialised cardiac center, *ARYA atherosclerosis*, 10(5), 233.
- SCAI. (2018). Retrieved from <http://www.scai.org/>
- Simon, T. D., & Moly, K. T., (2014). Long term health problems and awareness regarding its management among patients After valve replacement surgery. *Int. J. Pharm. Med.& Bio. Sc*, 3 (3), 131-145.
- Stoiceal, I., You, T., Eiterman, A., Hartwell, C., Davila, V., Marjoribanks, S., Florescu, C., Bergese, S. D., Rogers, B. (2017). Patients Perspectives of Post-Acute Transition of Care for Cardiac Surgery Review doi: 10.3389/fcvm.2017.00070Review

- Subeh, M.M., Salami, I., & Saleh, M.Y.N. (2014). Most frequent and severe symptoms and learning needs among CABG patients. *International Journal of Nursing, 1* (2), 167-182.
- Theobald, K., & McMurray, A. (2004). Coronary artery bypass graft surgery: discharge planning for successful recovery. *Journal of Advanced Nursing, 47*(5), 483-491.
- Tully, P. J. (2012). Psychological Depression and Cardiac Surgery: A Comprehensive Review, *JECT 44*(4), 224–232.
- UCSF Commencement. (2018). Retrieved from <https://www.ucsf.edu/news/2018-commencement>
- World Health Organization. (2014). Global status report on non-communicable diseases. Geneva.
- Zimmerman, L., Barnason, S., Young, L., Tu, C., Schulz, P., & Abbott, A. A. (2010). Symptom Profiles of Coronary Artery Bypass Surgery Patients at Risk for Poor Functioning Outcomes. *The Journal of Cardiovascular Nursing, 25*(4), 292-300.