

Clinical Profile and Treatment Outcome of Post CABG Patients

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Abstract

Background: Coronary artery bypass grafting (CABG) remains a key surgical intervention for patients with severe coronary artery disease. Understanding the clinical profile and treatment outcomes of post-CABG patients is essential to enhance recovery and reduce complications.

Methods: A quantitative, descriptive-analytical, cross-sectional study was conducted in the cardiothoracic surgery unit of a tertiary care hospital to assess the clinical characteristics and post-operative outcomes of patients who underwent CABG and to identify factors influencing recovery. A purposive sample of 200 post-CABG patients was selected based on specific inclusion and exclusion criteria. Data was collected using patient records, covering socio-demographic details, clinical variables, and treatment outcomes. The study was conducted for 6 months from January 2024 to June 2024. Statistical analysis was performed using descriptive and inferential statistics.

Results: The study evaluated age, comorbidities, diagnosis type, BMI, and blood pressure as key clinical variables. Associations between these variables and treatment outcomes were analyzed, with significant correlations identified in multiple domains.

Conclusion: The findings highlight the importance of detailed clinical profiling in predicting post-CABG recovery. Results can guide personalized care planning and improve post-operative management strategies in similar healthcare settings.

Keywords: Clinical Profile, Treatment Outcome, CABG

Introduction

Coronary artery disease (CAD) remains one of the most serious health challenges worldwide, contributing significantly to both illness and death. As more people are diagnosed with CAD—especially those with advanced or complex forms of the disease—coronary artery bypass grafting (CABG) has become a vital surgical option. For patients with multiple blocked arteries, left main coronary artery involvement, or

diabetes, CABG has proven effective in improving survival, relieving symptoms, and enhancing overall quality of life. Despite advances in medications and less invasive procedures, CABG continues to play a central role in managing severe coronary disease.¹

Recovery after CABG, however, is not always straightforward. Patients need close monitoring for potential complications, effective control of coexisting health issues, and guidance in making lifestyle changes to protect their heart health long-term. Outcomes can vary significantly depending on a person's age, sex, pre-existing medical conditions like diabetes or hypertension, and their overall response to surgery and rehabilitation. Recognizing these differences is essential for tailoring treatment and improving each patient's recovery journey.²

Despite advances in surgical techniques and perioperative care, treatment outcomes following CABG can vary significantly, influenced by a multitude of factors including age, presence of co-morbidities, nutritional status, and other clinical and socio-demographic variables. In particular, the post-operative recovery trajectory plays a critical role in determining patient prognosis, healthcare costs, and the need for long-term follow-up.³

Understanding the clinical profile of patients undergoing CABG and evaluating their post-operative outcomes is essential for optimizing care plans, identifying high-risk individuals, and enhancing recovery strategies. While global studies have contributed to the broader understanding of CABG outcomes, there is a growing need to explore such patterns within specific populations and healthcare settings, particularly in low- and middle-income regions where resource constraints may influence recovery and access to follow-up care.

A person's clinical profile—such as their age, cholesterol levels, smoking history, kidney function, and other health conditions—can help predict their risk for post-surgical complications like infection, arrhythmias, or prolonged hospital stays. At the same time, evaluating treatment outcomes such as symptom improvement, hospital readmission rates, and long-term survival helps us assess the true impact of CABG on patient health.⁴

While international research has provided useful data on CABG outcomes, there is still a lack of region-specific studies that reflect the realities of local healthcare systems. Factors like access to follow-up care, availability of cardiac rehabilitation, and socioeconomic conditions can influence recovery in significant ways. This study aims to bridge that gap by examining the clinical characteristics and recovery patterns of 200 post-CABG patients treated in our setting. The goal is to identify key predictors of recovery and contribute to more effective, patient-centered care for individuals undergoing CABG in similar healthcare environments.⁵

Need for the study

Coronary artery bypass grafting (CABG) is a widely used surgical intervention for managing advanced coronary artery disease. While it improves survival and relieves symptoms, patient outcomes vary significantly based on demographic, clinical, and lifestyle factors. Understanding the clinical profile and treatment outcomes of post-CABG patients is essential to identify key risk factors, monitor recovery patterns, and guide post-operative care. With the increasing burden of cardiovascular diseases, especially in aging and high-risk populations, this study is needed to enhance evidence-based clinical practices, reduce complications, and improve overall patient outcomes following CABG.⁶

Objectives

1. To assess the clinical profile of post CABG patients.
2. To assess the treatment outcome of post CABG patients.
3. To find out association of clinical profile and treatment outcome with selected demographic variables.

Research Methodology

1. Research Approach

This study adopts a quantitative, descriptive-analytical research approach to evaluate the clinical characteristics and treatment outcomes of patients who have undergone coronary artery bypass grafting (CABG).

2. Research Design

A non-experimental, descriptive cross-sectional design was used to assess clinical profiles and post-operative outcomes of post-CABG patients within a defined period.

3. Study Setting

The study was conducted in the cardiothoracic surgery unit of a tertiary care hospital that regularly performs CABG surgeries.

4. Population

All patients who underwent CABG surgery at the selected hospital during the study period formed the population.

5. Sample and Sampling Technique

Sample Size: 200 post-CABG patients

Sample Size Formula

$$n = Z^2 \cdot p \cdot (1-p) / d^2$$

Where:

n = required sample size

Z = Z-score for desired confidence level (usually 1.96 for 95% confidence)

p = estimated proportion of outcome or characteristic (0.5 is conservative, gives max sample)

d = allowable margin of error (precision), often 0.05 or 5%

Confidence level = 95% → Z=1.96

Proportion (p) = 0.5 (maximum variability, safest assumption)

Margin of error (d) = 0.07 (7% precision)

$$n = [(1.96)^2 \cdot 0.5 \cdot (1-0.5)] / (0.07)^2 = [8416 \cdot 0.25] / 0.00493 \approx 9604 / 0.00490 \approx 196$$

A sample size of ~196 is statistically appropriate under these assumptions. So your sample of 200 CABG patients is justified for a 95% confidence level and 7% margin of error.

- **Sampling Technique:** Purposive sampling was used to select patients who met the inclusion criteria during the study period.

Inclusion Criteria

- Patients aged 18 years and above
- Patients who underwent CABG at least 7 days prior to data collection
- Patients who gave informed consent to participate

Exclusion Criteria

- Patients with incomplete medical records
- Patients who underwent emergency CABG due to trauma or non-coronary causes
- Critically ill or unconscious patients unable to provide data

Duration of Study

The study was conducted over a period of 6 months, from January 2024 to June 2024, during which data were collected from eligible post-CABG patients admitted to the cardiothoracic surgery unit of the selected tertiary care hospital.

Data Collection Tools

A structured questionnaire and patient record review form were used to collect data on:

- Socio-demographic variables (age, gender, education, occupation, residence)
- Clinical profile (diagnosis, comorbidities, BMI, BP, glucose levels)
- Post-operative outcomes (hospital stay duration, complications, recovery score)

Data Collection Procedure

After obtaining institutional and ethical approval, eligible patients were identified and data were collected using face-to-face interviews and clinical records. Confidentiality and informed consent were ensured.

Data Analysis

- Descriptive statistics (mean, frequency, percentage) were used to summarize patient characteristics and outcomes.

Results

The result is done under following sections-

Section A- Frequency and Percentage of Demographic Variables

Table 1: Demographic Characteristics of the CABG patients (n = 200)

Sn.	Variables	Category	Frequency	Percentage
1	Age	Below 40 Years	28	14
		41 - 50 Years	56	28
		51 – 60 Years	48	24
		61 Years and above	68	34
2	Gender	Male	112	56
		Female	88	44
3	Education	Primary	55	27.5
		Secondary	34	17
		Graduation	65	32.5
		Post Graduation and above	46	23
4	Occupation	Student	8	4
		Agriculture	60	30
		Service	44	22
		Business	40	20
		Unemployed/Housemaker	48	24

5	Residential Area	Rural	114	57
		Urban	86	43
6	Habits	No any habit	24	12
		Alcoholism	64	32
		Smoking	70	35
		Tobacco	20	10
		Others:	22	11
7	Family history coronary artery disease	a) Yes	132	66
		b) No	68	34

The above table 1 represents the socio-demographic data of the study participants it reveal a diverse representation across various variables. In terms of age, most of the respondents (34%) were in the age group of 61 years and above, followed by 28% in the 41–50 years category, 24% between 51–60 years, and the least (14%) were below 40 years of age. Regarding gender, males constituted a higher proportion (56%) of the participants compared to females (44%). In terms of educational background, a significant number (32.5%) were graduates, followed by 27.5% who had primary education, 23% with post-graduation and above, and only 17% had secondary education.

With respect to occupation, the highest percentage (30%) were engaged in agriculture, followed by service workers

Section B – Clinical Profile of Post CABG Patient

Table 2: Assessment of Clinical Profile. (n = 200)

Sn.	Variables	Category	Frequency	Percentage
1	Diagnosis	Single-vessel disease	55	27.5
		Double-vessel disease	70	35
		Triple-vessel disease	75	37.5
2	Co-morbidities	Hypertension	66	33
		Diabetic Mellitus	38	19
		DM & HTN	76	38
		No any Co-Morbidity	20	10
3	Blood Pressure	Low Blood Pressure	28	14

(22%), housemakers/unemployed (24%), business persons (20%), and a small fraction (4%) were students. Analyzing the residential area, a majority of the participants (57%) resided in rural areas, while 43% belonged to urban settings. Concerning personal habits, smoking was reported by 35% of respondents, alcoholism by 32%, tobacco use by 10%, other habits by 11%, and only 12% reported having no habits at all. Lastly, the data on family history of coronary artery disease indicated that a substantial proportion (66%) had a positive family history, whereas 34% reported no such history.

		Normal Blood Pressure	72	36
		High Blood Pressure	100	50
4	Blood Glucose Level	Hypoglycemia	26	13
		Normal BGL	80	40
		Hyperglycemia	94	47
5	BMI	Underweight	46	23
		Normal	74	37
		Overweight	80	40
6	Duration of Hospital Stay	Less than 5 days	26	13
		6-8 days	116	58
		9-11 days	34	17
		12 days & more	24	12

Table 2 interprets the clinical characteristics of the study participants it reveal varied patterns in diagnosis and associated health conditions. Regarding diagnosis, the largest proportion of patients (37.5%) were diagnosed with triple-vessel disease, followed by double-vessel disease in 35% of cases and single-vessel disease in 27.5% of the participants. In relation to co-morbidities, 38% of the individuals had both diabetes mellitus (DM) and hypertension (HTN), 33% had hypertension alone, and 19% were diagnosed with diabetes mellitus only, while 10% reported no co-morbid condition.

When examining blood pressure levels, half of the study population (50%) presented with high blood pressure, 36% had normal readings, and 14% had low blood

Section C – Treatment Outcome of Post CABG Patient

Table 3: Assessment of Treatment Outcome of CABG Patient (n = 200)

Sn.	Outcome of CABG Patient	Range of score	Frequency	Percentage
1	No Deviation	8-14	65	32.5
2	Mild Deviation	15-20	70	35
3	Moderate Deviation	21-26	45	22.5
4	Severe Deviation	27-32	20	10

Table 3 represents the assessment of outcomes among CABG patients, based on the deviation score, indicates varying levels of post-operative recovery and clinical

pressure. Concerning blood glucose levels, hyperglycemia was observed in the majority (47%), followed by normal blood glucose levels in 40% of participants, and hypoglycemia in 13%. With respect to body mass index (BMI), 40% were found to be overweight, 37% had a normal BMI, and 23% were underweight. Lastly, in terms of duration of hospital stay, the majority (58%) were hospitalized for 6–8 days, while 17% stayed for 9–11 days, 13% for less than 5 days, and 12% had an extended stay of 12 days or more.

stability. Among the total participants, the highest proportion (35%) exhibited a mild deviation with scores ranging from 15 to 20, suggesting minor deviations from

expected recovery patterns. This was followed by 32.5% of patients showing no deviation (score range 8–14), reflecting a stable and favourable post-surgical outcome. Meanwhile, 22.5% of patients demonstrated a moderate deviation (scores between 21–26), indicating noticeable

but manageable recovery issues. Only 10% of the patients fell under the severe deviation category with scores ranging from 27 to 32, representing significant concerns or complications in their post-CABG recovery process.

Section D – Association Between Clinical Profile and Treatment Outcome of Post CABG Patient with Demographic variable

Table 4: Association Between Treatment Outcome with Demographic variable (n = 200)

Sn.	Variables	Category	Chi square value	P value	Table value
1	Age	Below 40 Years	18.16*	0.04*	16.91
		41 - 50 Years			
		51 – 60 Years			
		61 Years and above			
2	Gender	Male	6.44	0.76	7.81
		Female			
3	Education:	Primary	12.33	0.21	16.91
		Secondary			
		Graduation			
		Post Graduation and above			
4	Occupation:	Student	17.54	0.4	21.02
		Agriculture			
		Service			
		Business			
		Unemployed/Housemaker			
5	Residential Area	Rural	5.87	0.9	7.81
		Urban			
6	Habits	No any habit	18.66	0.7	21.02
		Alcoholism			
		Smoking			
		Tobacco			
		Others:			
7	Family history coronary artery disease	a) Yes	4.78	0.9	7.81
		b) No			

Table 4 depicts the association between selected demographic variables and the outcomes of CABG patient. A statistically significant association was found with the variable Age (Chi-square value = 18.16, p = 0.04) compared to the table value of 16.91, indicating that age may have a significant influence on post-CABG outcomes. In contrast, variables such as Gender (Chi-square = 6.44, p = 0.76), Education (Chi-square = 12.33, p = 0.21), Occupation (Chi-square = 17.54, p = 0.40), Residential Area (Chi-square = 5.87, p = 0.90), Habits

(Chi-square = 18.66, p = 0.70), and Family history of coronary artery disease (Chi-square = 4.78, p = 0.90) did not show statistically significant associations, as their p-values were greater than 0.05 and chi-square values were below their respective table values. This suggests that among the examined variables, age was the only factor found to significantly influence the outcome in CABG patients in this study.

Table 5: Association Between Treatment Outcome with Clinical Variable (n = 200)

Sn.	Variables	Category	Chi square value	P value	Table value
1	Diagnosis	Single-vessel disease	14.76*	0.04*	12.52
		Double-vessel disease			
		Triple-vessel disease			
2	Co-morbidities	Hypertension	19.02*	0.02*	16.91
		Diabetic Mellitus			
		DM & HTN			
		No any Co-Morbidity			
3	Blood Pressure	Low Blood Pressure	14.88*	0.03*	12.52
		Normal Blood Pressure			
		High Blood Pressure			
4	Blood Glucose Level	Hypoglycemia	10.66	0.56	12.52
		Normal BGL			
		Hyperglycemia			
5	BMI	Underweight	13.59*	0.04*	12.52
		Normal			
		Overweight			
6	Duration of Hospital Stay	Less than 5 days	12.43	0.66	16.91
		6-8 days			
		9-11 days			
		12 days & more			

Table 5 depicts the association between selected clinical variables and the outcomes of patients who underwent CABG (Coronary Artery Bypass Grafting). The analysis

revealed that certain variables showed statistically significant associations. Notably, diagnosis type showed a significant association with patient outcomes ($\chi^2 =$

14.76, $p = 0.04$) against a table value of 12.52, suggesting that the extent of coronary vessel involvement (single, double, or triple) significantly influenced recovery. Similarly, the presence of co-morbidities also demonstrated a significant relationship ($\chi^2 = 19.02$, $p = 0.02$), particularly among those with hypertension and diabetes, indicating these conditions may adversely impact post-operative recovery.

In addition, blood pressure levels were significantly associated with outcomes ($\chi^2 = 14.88$, $p = 0.03$), implying that abnormalities in blood pressure—whether low or high—could affect recovery patterns following CABG. The Body Mass Index (BMI) also had a significant association ($\chi^2 = 13.59$, $p = 0.04$), showing that nutritional status and weight-related factors may influence patient outcomes. However, no significant association was found between blood glucose levels ($\chi^2 = 10.66$, $p = 0.56$) and duration of hospital stay ($\chi^2 = 12.43$, $p = 0.66$), as both values fell below the critical chi-square values and had high p-values. These findings suggest that while some physiological and diagnostic variables play a critical role in influencing recovery after CABG, others such as blood glucose levels and length of hospitalization may not have a statistically significant impact in this sample.

Discussion

The present study was conducted to assess the clinical profile and treatment outcomes of patients who underwent Coronary Artery Bypass Grafting (CABG), with a specific focus on socio-demographic and clinical variables and their relationship with post-operative outcomes. The findings provide valuable insights into the diverse characteristics and recovery trajectories of CABG patients, and align with trends observed in previous cardiac studies.

The socio-demographic data indicated a higher concentration of CABG procedures among older adults, particularly those aged 61 years and above (34%), which is consistent with known age-related degeneration in cardiovascular health and increased incidence of coronary artery disease (CAD) among the elderly population⁷. Males formed the majority (56%) of the participants, reinforcing the gender disparity in CAD prevalence, where men are generally more affected than women due to a combination of genetic, hormonal, and behavioral factors⁸.

Educational background showed a mixed profile, with 32.5% of participants being graduates. A significant rural representation (57%) and predominant engagement in agriculture (30%) indicate that lifestyle and environmental factors may also influence cardiac health. The prevalence of risk habits such as smoking (35%) and alcoholism (32%) is concerning, as these behaviors are well-documented contributors to cardiovascular morbidity and mortality⁹. Furthermore, a family history of CAD was reported in 66% of patients, highlighting the influence of genetic predisposition in cardiovascular diseases¹⁰.

In terms of clinical characteristics, the majority of patients were diagnosed with triple-vessel disease (37.5%), reflecting severe coronary pathology. This aligns with previous findings suggesting that patients often present at advanced stages of CAD in low- and middle-income settings due to delayed diagnosis and limited access to cardiac care¹¹. The study also revealed that a substantial portion (38%) had both diabetes mellitus and hypertension, the coexistence of which is recognized as a high-risk combination for adverse cardiovascular outcomes¹².

The prevalence of high blood pressure (50%) and hyperglycemia (47%) further supports the significant

burden of uncontrolled chronic diseases among CABG patients. Overweight individuals (40%) were more prevalent than underweight (23%) and normal (37%) patients, reflecting changing lifestyle trends and growing obesity-related cardiac risk¹³. Despite the standard duration of hospital stay (6–8 days for 58% of patients), some experienced prolonged recovery, possibly influenced by co-morbidities and post-operative complications.

Assessment of treatment outcomes through deviation scoring revealed that 35% of patients experienced mild deviation, 32.5% had no deviation, while 22.5% had moderate and 10% had severe deviations. This indicates that while a significant proportion had favorable recovery, a notable number experienced delayed or complicated recovery, emphasizing the need for individualized post-operative care plans.

Statistical analysis revealed a significant association between age and CABG outcome ($p = 0.04$), suggesting that older patients are more prone to post-operative complications, likely due to diminished physiological reserves and higher prevalence of co-morbidities¹⁴. Other demographic factors such as gender, education, occupation, residence, personal habits, and family history did not show significant associations, indicating their limited predictive value in this sample.

Among clinical variables, diagnosis type, presence of co-morbidities, blood pressure, and BMI showed significant associations with CABG outcomes. These findings corroborate existing research that identifies these factors as key determinants of cardiac surgery prognosis^{15,16}. On the other hand, blood glucose level and duration of hospital stay were not significantly associated with outcomes, suggesting that glycemic status and hospitalization length alone may not be reliable predictors of recovery in isolation.

Overall, the findings underscore the importance of comprehensive pre-operative evaluation, aggressive management of co-morbidities, and targeted post-operative care to optimize outcomes. The study further highlights the need for greater emphasis on lifestyle modification and preventive cardiology, particularly in rural and aging populations.

Recommendations

1. The study can be conducted on larger population.
2. The similar study can be conducted by including all invasive cardiac surgery patients.
3. Multicentred study can be conducted.

Conclusion

This study provides important insights into the clinical profile and recovery outcomes of patients undergoing coronary artery bypass grafting (CABG), particularly within a resource-limited healthcare setting. The findings affirm that advanced age, presence of multiple co-morbidities, elevated blood pressure, and abnormal BMI significantly influence post-operative outcomes, underlining the need for comprehensive pre-operative risk assessment and individualized care planning. Although many patients experienced favorable or mildly deviated recoveries, a notable proportion faced moderate to severe complications, emphasizing the critical role of early detection and management of high-risk factors. Socio-demographic factors such as gender, education, and residence were not significantly associated with outcomes in this cohort, suggesting that clinical variables may serve as more reliable predictors of post-CABG recovery. Ultimately, the study underscores the value of targeted interventions, lifestyle modification, and tailored follow-up strategies to improve patient care and surgical success, particularly in populations with limited access to specialized cardiac services.

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