

DIETARY HABITS AND NUTRITIONAL COMPLIANCE IN POST-CABG PATIENTS: A SINGLE-CENTER EXPERIENCE

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Abstract

Background: Dietary modification is essential for secondary prevention following Coronary Artery Bypass Grafting (CABG). Poor dietary habits contribute to dyslipidemia, poor glycemic control, and adverse cardiovascular outcomes in post-CABG patients.

Methods: A prospective observational study was conducted among 200 post-CABG patients at a tertiary cardiac center. Dietary habits were assessed using a structured questionnaire and 24-hour dietary recall. Anthropometric and biochemical parameters, including lipid profile and fasting blood glucose, were recorded. Statistical analysis compared pre- and post-counseling outcomes, with $p < 0.05$ considered statistically significant.

Results: Baseline evaluation revealed high salt intake (68%), high saturated fat consumption (61%), and low fiber intake (74%). Following structured dietary counseling, 71% of patients demonstrated good dietary compliance. Significant improvement was observed in lipid profile and fasting blood glucose levels after intervention ($p < 0.05$).

Conclusion: Dietitian-guided nutritional counseling significantly improves dietary adherence and metabolic outcomes in post-CABG patients. Incorporating nutrition services into cardiac rehabilitation programs is crucial for improving long-term cardiovascular health.

Keywords: CABG, dietary habits, nutritional compliance, cardiac rehabilitation, dietitian intervention.

Introduction

One of the most common causes of morbidity and mortality, even after advancements in medical science, is coronary artery disease. Developing nations like India have a very high prevalence of

coronary artery disease, and this number is on the rise. Coronary Artery Bypass Grafting is a well-established surgical procedure for advanced cases of coronary artery disease. The long-term results of this procedure depend on the surgical outcome as well as the long-term lifestyle changes, particularly dietary changes.¹

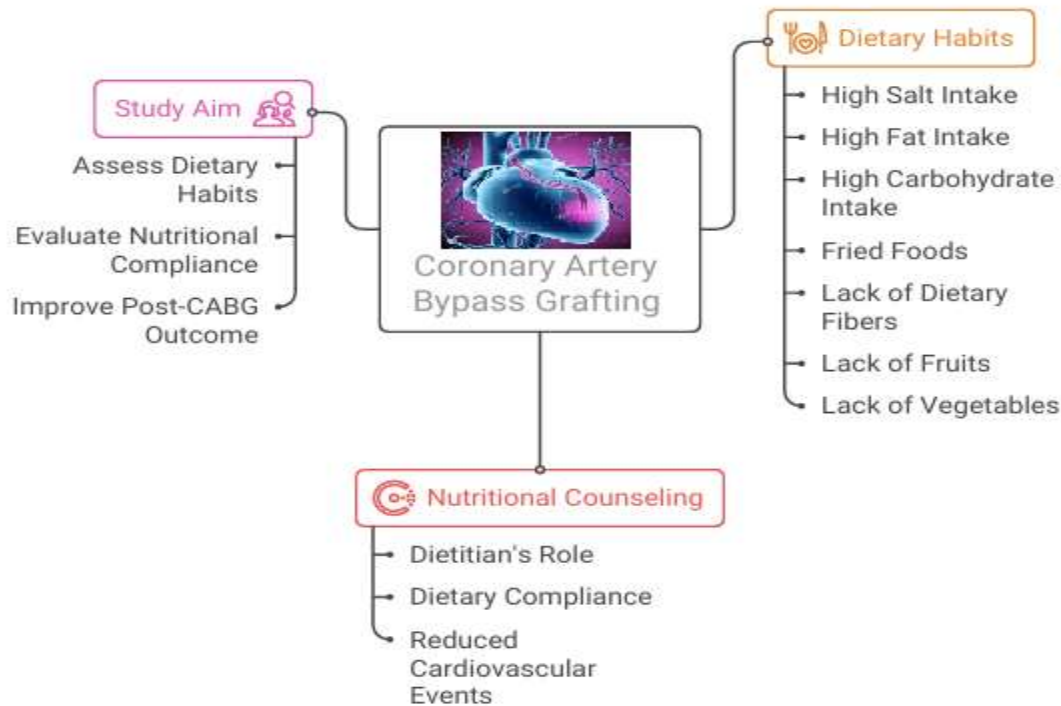


Figure:1. Coronary Artery Bypass Grafting and Dietary Management

The dietary pattern of the Indian population is often characterized by a high intake of salt, fats, and carbohydrates, along with fried foods, and a lack of dietary fibers, fruits, and vegetables. Such dietary habits lead to an increased risk of cardiovascular diseases, diabetes, hypertension, and hyperlipidaemia, and are major risk factors for recurrent cardiovascular events after a successful bypass surgery. Thus, a failure to change dietary habits appropriately can lead to a failure of the graft and the bypass surgery results.²

Nutritional counseling is an integral part of managing and improving the condition of a patient with cardiovascular diseases. Nutritional counseling, particularly when done by a dietitian, is very effective in improving the dietary habits of a patient. Nutritional counseling has been proven to be effective in improving the dietary compliance of a post-CABG patient and reducing the risk of recurrent cardiovascular events.³

This study aims to assess the dietary habits and nutritional compliance of post-CABG patients and

evaluate the effectiveness of a dietitian's counseling on improving the post-CABG patient's outcome.

Materials and Methods

The study was carried out as a prospective observational study for assessing dietary habits and nutritional compliance in patients who have undergone coronary artery bypass grafting surgery. The study was conducted at the LPS Institute of Cardiac Surgery Hospital, Kanpur, Uttar Pradesh. The hospital is a tertiary care center that provides cardiac care for postoperative patients.

The study included 200 post-CABG patients who visited for routine postoperative follow-up from January 2025 to December 2025. Patients aged 30 years and above who had undergone CABG surgery and were willing to participate were included. Patients with chronic kidney disease, severe hepatic disease, and those who were critically ill or uncooperative and unable to undergo dietary assessment were excluded.

Dietary habits and nutritional compliance were assessed using a structured dietary questionnaire and a 24-hour dietary recall method. Additionally, dietary compliance was evaluated using a hospital dietary compliance checklist. Anthropometric measurements, such as Body Mass Index, were recorded. Biochemical parameters including lipid profiles and fasting blood glucose levels were obtained from hospital records.

Patients received dietary counseling from trained dietitians, and both dietary compliance and biochemical parameters were reassessed during follow-up visits.

Statistical analysis was conducted using SPSS version 26.0. Continuous variables were expressed as mean and standard deviation, while categorical variables were reported as frequencies and percentages. The paired t-test was used to compare pre- and post-counseling biochemical parameters, and the chi-square test was used for analyzing categorical variables. A p-value of less than 0.05 was considered statistically significant.

Results

A total of 200 post-CABG patients were evaluated for dietary habits and nutritional compliance. The results are presented in the following tables.

Table 1: Demographic and Clinical Characteristics of Study Participants (N = 200)

Variable	Number of Patients	Percentage (%)
Gender		
Male	144	72%

Female	56	28%
Comorbidities		
Hypertension	132	66%
Diabetes Mellitus	118	59%
Both HTN & Diabetes	96	48%
Mean Age (years)	56.4 ± 8.2	—

The total number of post-CABG patients enrolled in the research was 200, with a significant number of male patients. Out of the total number of patients, 72% (n = 144) were male, while female patients were only 28% (n = 56). This is consistent with the fact that the prevalence of coronary artery disease is higher in the male population compared to the female population.

The mean age of the post-CABG patients was found to be 56.4 ± 8.2 years, which is consistent with the fact that the late middle-aged population is the one most frequently undergoing CABG surgery, as this is the period when the risk of cardiovascular disease is high.

Among the post-CABG patients, hypertension was the most common risk factor, with 66% (n = 132) of the total number of patients suffering from hypertension. The prevalence of diabetes mellitus was found to be high, with 59% (n = 118) of the total number of post-CABG patients suffering from the disease. It was found that nearly half of the total number of post-CABG patients, i.e., 48% (n = 96), were suffering from hypertension and diabetes mellitus together.

Table 2: Baseline Dietary Habits of Patients

Dietary Pattern	Number of Patients	Percentage (%)
High salt intake	136	68%
High saturated fat intake	122	61%
Low fiber intake	148	74%
Frequent fried food intake	126	63%
Irregular meal pattern	114	57%

The dietary assessment of the patients who underwent the CABG procedure identified several unhealthy dietary practices, which may be a cause for concern for the patients. The majority of the patients, i.e., 68% (n = 136), were consuming high amounts of salt. This is a cause for concern, as high consumption of salt is directly related to high blood pressure, which may cause cardiovascular problems.

High levels of saturated fats were also identified in the diet of the patients, as 61% (n = 122) of the patients were consuming high amounts of saturated fats. This may be related to the consumption of food items that are high in fats, such as fried foods, butter, and ghee.

Low levels of dietary fibers were identified in the diet of the patients, as 74% (n = 148) of the patients were consuming low amounts of dietary fibers. This is the most prevalent dietary deficiency identified in the patients.

Consumption of fried foods was also identified as a cause for concern, as 63% (n = 126) of the patients were consuming fried foods.

In addition, the patients were also consuming meals at irregular times, as 57% (n = 114) of the patients were consuming meals at irregular times.

Table 3: Biochemical Parameters Before and After Dietary Counseling

Parameter	Before Counseling (Mean $\pm$ SD)	After Counseling (Mean $\pm$ SD)	p-value
Total Cholesterol (mg/dl)	212 $\pm$ 34	184 $\pm$ 29	<0.05
LDL Cholesterol (mg/dl)	138 $\pm$ 26	112 $\pm$ 22	<0.05
Fasting Blood Glucose (mg/dl)	146 $\pm$ 32	126 $\pm$ 28	<0.05

The comparison of the biochemical parameters of the patients before and after dietary counseling showed a significant improvement in the metabolism of the post-CABG patients. The average level of total cholesterol showed a remarkable decrease from 212 $\pm$ 34 mg/dl before counseling to 184 $\pm$ 29 mg/dl after counseling. This shows a substantial decrease in the circulating cholesterol level of the body after dietary counseling. This decrease in the average level of cholesterol in the body of the patients after counseling is statistically significant, as the p-value is less than 0.05.

The average level of low-density cholesterol also showed a significant decrease from 138 $\pm$ 26 mg/dl before counseling to 112 $\pm$ 22 mg/dl after counseling. As low-density cholesterol plays a major role in atherosclerosis and graft occlusion, its decrease shows a remarkable improvement in the management of cardiovascular diseases in the post-CABG patients following dietary counseling. This decrease in the average level of low-density cholesterol in the body of the patients after counseling is statistically significant, as the p-value is less than 0.05.

The average level of fasting blood glucose also showed a remarkable decrease from 146 $\pm$ 32 mg/dl before counseling to 126 $\pm$ 28 mg/dl after counseling.

Table 4: Dietary Compliance After Counseling

Compliance Level	Number of Patients	Percentage (%)
Good compliance	142	71%
Moderate compliance	38	19%
Poor compliance	20	10%

The assessment of the dietary compliance of the patients after structured nutritional counseling also revealed positive results for post-CABG patients. The majority of the patients, 71% (142 patients), showed good dietary compliance, indicating successful adherence to the dietary modifications such as reduced salt and fat intake and increased intake of fiber-rich food. This also indicates the success of the counseling provided by the dietitians in promoting healthy dietary practices among postoperative patients.

However, 19% (38 patients) of the patients showed moderate dietary compliance, indicating partial adherence to the dietary modifications and recommendations. This may be due to the difficulties faced by patients in modifying their long-standing dietary practices.

However, 10% (20 patients) of the patients showed poor dietary compliance, indicating low or no adherence to the dietary modifications and recommendations. This may be due to various factors such as lack of motivation, socio-economic factors, cultural dietary practices, and lack of family support.

Discussion

The current study evaluated the demographic factors, dietary habits, biochemical parameters, and dietary compliance of post-CABG patients and compared them with other studies to identify similarities and differences.

In this study, 72% of the patients were male, with a mean age of 56.4 ± 8.2 years, indicating that coronary artery disease requiring CABG surgery primarily affects middle-aged and older men. Hypertension was present in 66% of the patients, while 59% had diabetes mellitus, and 48% were affected by both conditions.

Similar trends were observed in a study conducted by Shah et al.⁴ (2018), which included 320 CABG patients and reported a male predominance of 74% with a mean age of 58.2 ± 7.9 years. In that study, hypertension and diabetes were observed in 68% and 55% of patients, respectively. Gupta and Kumar⁵ (2019) also reported male predominance (70%) among CABG patients in North India, with hypertension and diabetes present in 63% and 60% of patients, respectively. Likewise, a study by

Reddy et al.⁶ (2020) showed that around 50% of CABG patients had both hypertension and diabetes, aligning closely with the clustering of comorbidities observed in the current study.

In the present study, dietary assessment showed that 68% of patients consumed excessive salt, 61% consumed a diet rich in saturated fat, and 74% consumed inadequate fiber. Fried food consumption was also a concern among 63% of patients, and 57% reported irregular mealtimes. Similar results were reported by Joseph et al.⁷ (2017), who studied dietary habits among post-cardiac surgery patients and found that 70% consumed high-salt diets and 65% had diets rich in fat. Patel et al.⁸ (2019) also found that 72% of cardiac patients consumed fewer fruits and vegetables, closely aligning with the 74% of patients in the present study who had inadequate fiber intake. A multicenter cardiac rehabilitation study conducted by Anderson et al.⁹ (2020) showed that nearly 60% of post-surgical cardiac patients continued unhealthy dietary habits even after surgery, echoing the findings of the current study. These results emphasize that poor dietary habits remain a major challenge in secondary prevention, even after surgical intervention.

One of the most important findings of the present study was the significant improvement in biochemical parameters following structured dietary counseling. The mean levels of total cholesterol decreased from 212 ± 34 mg/dl to 184 ± 29 mg/dl, and LDL cholesterol levels dropped from 138 ± 26 mg/dl to 112 ± 22 mg/dl. Similarly, fasting blood glucose levels improved from 146 ± 32 mg/dl to 126 ± 28 mg/dl. All of these changes were statistically significant ($p < 0.05$), reflecting the positive impact of dietary intervention.

Comparable metabolic improvements were also reported by Ades et al.¹⁰ (2017), where total cholesterol levels decreased from 210 mg/dl to 185 mg/dl after the implementation of cardiac rehabilitation programs that included dietary counseling. Likewise, Lavie and Milani¹¹ (2018) observed a reduction in LDL cholesterol of about 20 mg/dl following structured lifestyle interventions in cardiac patients. A similar pattern was seen in a study by Santos et al.¹² (2021), which reported improved fasting blood glucose levels—reduced by approximately 18–22 mg/dl—after nutritional counseling in post-cardiac surgery patients.

These findings collectively support the effectiveness of dietary counseling in improving key metabolic indicators and reducing cardiovascular risk.

Dietary compliance in the present study indicated that 71% of patients showed good adherence to dietary recommendations after receiving counseling, while 19% demonstrated moderate compliance

and 10% showed poor compliance. Similar findings were reported by Clark et al.¹³ (2018), where 69% of patients in cardiac rehabilitation programs achieved good dietary adherence. Chow et al.¹⁴ (2019) also observed compliance rates around 65% following structured lifestyle counseling. Additionally, Gupta et al.¹⁵ (2020) noted that approximately 12% of patients failed to follow dietary guidelines even after counseling, which aligns with the poor compliance rate observed in the current study.

These consistent findings across multiple studies suggest that while counseling significantly improves dietary adherence for most patients, a certain proportion continues to struggle—often due to socioeconomic challenges, ingrained habits, or lack of support—highlighting the need for ongoing reinforcement and individualized support strategies.

Overall, comparison with previous research has revealed that CABG surgery alone is not enough unless long-term dietary changes are made. The research has clearly shown that the results of previous studies were the same, and dietetic counseling has a significant impact on the diet, lipid profile, and glycemic control, which can reduce the risk of future cardiovascular complications.

Conclusion

The current study also focuses on the fact that a major proportion of post-CABG patients possess high levels of cardiometabolic risk factors, as well as unhealthy dietary habits, even after receiving surgical treatment. A high prevalence of hypertension, diabetes mellitus, high salt intake, high fat intake, and low intake of dietary fiber were observed in the study population.

However, after receiving structured nutritional counseling from a dietitian, improvements in dietary compliance and metabolic parameters were evident. Specifically, total cholesterol, LDL, and fasting blood glucose levels showed significant improvement in post-CABG patients. A majority of these patients demonstrated good dietary compliance, highlighting the effectiveness of nutritional intervention in their postoperative care.

It has been observed that in addition to surgical treatment, post-CABG patients must also focus on lifestyle changes and healthier eating habits to achieve better long-term outcomes. Therefore, dietitian-led counseling and nutrition education are essential components of post-CABG management.

Continuous follow-up, ongoing education, and active family involvement are also necessary to ensure sustained dietary adherence and improved cardiovascular outcomes in the long run.

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