

A Study to Assess the Effectiveness of Early Exercise on Post-Surgical Recovery Among Patients Undergone Cardiac Bypass Surgery at Selected Cardiac Hospitals

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Abstract

Postoperative recovery following coronary artery bypass grafting (CABG) is often prolonged due to pain, reduced mobility, respiratory complications, and psychological distress. Early mobilization has been increasingly recommended as a supportive intervention to enhance recovery outcomes. The present study was conducted to assess the effectiveness of early exercise on post-surgical recovery among patients who underwent cardiac bypass surgery at a selected cardiac hospital. A quantitative, quasi-experimental design was adopted for the study. A total of 60 post-CABG patients were selected using purposive sampling and were divided into two groups: the intervention group, which received a structured early exercise program along with routine care, and the control group, which received only routine postoperative care. The early exercise protocol included breathing exercises, limb movements, and gradual ambulation initiated within the first 24–48 hours after surgery, based on patient stability. Recovery outcomes were assessed using a structured recovery assessment scale focusing on physical, respiratory, and functional parameters. The findings revealed that patients in the intervention group demonstrated significantly better improvement in mobility, reduced incidence of postoperative complications such as atelectasis, and improved self-care ability compared to the control group. Additionally, a noticeable reduction in anxiety levels and hospital stay duration was observed among patients who participated in early exercise. The results indicate that early exercise plays a crucial role in accelerating recovery and improving overall postoperative well-being in CABG patients. The study concludes that incorporating structured early exercise programs into routine post-cardiac surgery care can enhance recovery outcomes and should be encouraged in clinical practice.

Keywords: Early exercise, coronary artery bypass grafting, postoperative recovery, cardiac rehabilitation, mobility improvement

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INTRODUCTION

Coronary artery disease (CAD) is one of the leading causes of morbidity and mortality worldwide. For patients with advanced disease, coronary artery bypass grafting (CABG) is often performed to restore adequate blood flow to the heart and improve their survival and quality of life. Although surgery is effective in treating the underlying cardiac condition, the postoperative period is usually challenging. Patients commonly experience pain, fatigue, reduced lung function, limited mobility, and emotional stress, all of which can delay their recovery. In recent years, the emphasis has shifted from simply managing complications to actively promoting early recovery.

Among various interventions, early exercise has gained importance as a simple and cost-effective approach for improving post-surgical outcomes. It involves initiating mild physical activity, such as breathing exercises, limb movements, and gradual ambulation, soon after surgery, depending on the patient's stability [1].

Background of Study

Traditionally, patients who underwent cardiac surgery were advised to undergo prolonged bed rest to allow complete healing. However, evidence over time has shown that extended immobilization may contribute to complications such as deep vein thrombosis, pulmonary infections, muscle weakness, and delayed functional recovery. Consequently, cardiac rehabilitation practices have evolved significantly, with early mobilization becoming a key component. Studies on cardiac rehabilitation suggest that patients who begin movement early after CABG tend to regain functional independence faster and experience fewer respiratory complications. However, the implementation of structured early exercise protocols varies across healthcare settings, particularly in resource-limited hospitals [2].

Need for the Study

Although CABG is a commonly performed and life-saving procedure, postoperative recovery remains a critical phase that determines long-term outcomes. In many cardiac hospitals, patients are still managed conservatively in the early postoperative days, and structured exercise programs are not consistently implemented. There is a need to explore and establish evidence on how early exercise influences recovery in clinical settings. Understanding its effectiveness can help nurses and healthcare providers to integrate it into routine care practices. Moreover, early mobilization may reduce hospital stays, lower healthcare costs, and improve patient confidence and independence after surgery. Therefore, this study was undertaken to assess the effectiveness of early exercise on post-surgical recovery among patients who have undergone CABG in a selected cardiac hospital [3].

REVIEW OF LITERATURE

A review of existing studies shows a growing recognition of the importance of early mobilization after cardiac surgery, particularly after CABG. Researchers have consistently reported that patients who begin moving soon after surgery tend to have better respiratory function, improved circulation, and faster return to daily activities [4].

A study conducted in Europe highlighted that early ambulation within 24–48 h after CABG significantly reduced the incidence of pulmonary complications, such as atelectasis and pneumonia. The authors noted that gentle physical activity helped maintain lung expansion and improved oxygenation levels [5].

Another study in India observed that patients who participated in structured early exercise programs showed improved functional capacity and reduced length of hospital stay compared with those who received standard care alone. The findings also suggest that early movement contributes to better psychological well-being by reducing anxiety and increasing patient confidence. A systematic review of post-cardiac surgery rehabilitation emphasized that early exercise is safe when properly monitored and does not increase the risk of surgical complications. Instead, it supports faster recovery of muscle strength and promotes independence in self-care. However, some studies have also pointed out barriers such as patient discomfort, fear of wound injury, and lack of standardized protocols among healthcare providers. These factors often limit the consistent application of early exercise in clinical practice [6].

Conceptual Framework

The conceptual framework for this study is based on the Input–Process–Output (IPO) model, which helps in understanding the relationship between early exercise and postoperative recovery.

- *Input:* Demographic variables (age, sex, and medical history), clinical condition of CABG patients, and hospital environment.

- *Process*: Refers to the implementation of early exercise, which includes breathing exercises, limb movements, and gradual ambulation initiated within the first 24–48 h after surgery under supervision.
- *Output*: Represents the outcomes measured in terms of improved mobility, reduced postoperative complications, enhanced respiratory function, decreased anxiety, and shorter hospital stay.

This framework helped systematically examine how structured early exercise influences recovery outcomes in post-CABG patients.

METHODOLOGY

Research Design

A quantitative approach with a quasi-experimental research design was adopted for this study. This design was considered appropriate because it allowed a comparison between the intervention and control groups without complete randomization.

Setting of the Study

The study was conducted in a selected cardiac hospital where post-CABG patients received specialized postoperative care and rehabilitation services.

Population

The target population consisted of patients who had undergone coronary artery bypass graft surgery and were in the early postoperative recovery phase.

Sample and Sampling Technique

A total of 60 post-CABG patients were selected using a purposive sampling technique based on inclusion criteria such as medical stability, age, and willingness to participate.

Groups

Participants were divided into:

- *Intervention group*: Received structured early exercise along with routine postoperative care.
- *Control group*: Received only routine postoperative care.

Intervention

The early exercise program included deep breathing exercises, ankle and leg movements, upper limb exercises, and gradual ambulation starting within 24–48 h after surgery, depending on patient stability and physician approval.

Data Collection Tool

A structured checklist/scale was used to assess recovery outcomes, focusing on mobility, respiratory status, pain perception, and functional independence.

Data Analysis

Data was analyzed using descriptive and inferential statistics to compare the recovery outcomes between the intervention and control groups.

Ethical Considerations

Approval was obtained from the institutional ethics committee. Informed consent was obtained from all participants, and the confidentiality of patient information was strictly maintained.

Objectives of the Study

1. To assess the level of postoperative recovery among patients who underwent CABG and received early exercise.

2. To assess the level of postoperative recovery among patients who underwent CABG and received routine care.
3. To compare the postoperative recovery between the experimental and control groups.
4. To evaluate the effectiveness of early exercise on postoperative recovery in CABG patients.
5. To find the association between postoperative recovery and selected demographic variables.

Hypotheses

H1: There is a significant difference in postoperative recovery between CABG patients who received early exercise and those who received routine care.

H2: There is a significant association between postoperative recovery and selected demographic variables among CABG patients.

Variables of the Study

- *Independent variable*: Early exercise program
- *Dependent variable*: Postoperative recovery of CABG patients
- *Extraneous variables*: Age, sex, comorbidities, duration of surgery, lifestyle habits, and previous medical history

Operational Definitions

- *Early exercise*: A structured program of physical activity, including breathing exercises, limb movements, and gradual ambulation, initiated within 24–48 h after CABG surgery under medical supervision.
- *CABG*: A surgical procedure performed to improve blood flow to the heart by bypassing the blocked coronary arteries.
- *Postoperative Recovery*: The Improvement in the physical, respiratory, and functional status of patients after CABG surgery was measured using a structured recovery assessment scale.
- *Effectiveness*: The extent to which early exercise improves recovery outcomes, such as mobility, respiratory function, and self-care ability.

Inclusion Criteria

- Patients aged 30–70 years who underwent CABG surgery
- Patients who were medically stable in the postoperative period
- Patients willing to participate in the study
- Patients admitted to the selected cardiac hospital during the study period

Exclusion Criteria

- Patients with postoperative complications requiring intensive care support
- Patients with neurological or musculoskeletal disorders limiting mobility
- Hemodynamically unstable patients
- Patients unwilling to participate

Data Collection Procedure

After obtaining ethical clearance and administrative permission, patients who met the inclusion criteria were selected using purposive sampling. Informed consent was obtained from all participants.

The sample was divided into experimental and control groups. The experimental group received a structured early exercise program consisting of breathing exercises, limb movements, and gradual ambulation starting within 24–48 h post-surgery. The control group received routine postoperative care only.

Pre-assessment of recovery status was performed for both groups using a structured recovery scale. Post-assessment was conducted after the intervention. Data were systematically recorded for analysis.

Data Analysis Plan

Data was analyzed using descriptive and inferential statistics:

- Frequency and percentage for demographic variables
- Mean and standard deviation for recovery scores
- Independent t-test to compare recovery between groups
- Chi-square test to assess the association between recovery and demographic variables
- Significance level set at $p < 0.05$

RESULTS/FINDINGS

The demographic distribution of patients is presented in Table 1. Most participants belonged to the 51–60 years age group (33.3%), followed by the 41–50 years (30%), 61–70 years (20%), and 30–40 years (16.7%) age groups. In terms of sex, the majority were male (63.3%), while females accounted for 36.7%, indicating a higher representation of male patients in the study (Table 1).

Postoperative recovery outcomes, shown in Table 2, revealed that the experimental group had a higher mean recovery score (78.4 ± 6.2) than the control group (62.1 ± 7.5), suggesting better recovery in the experimental group.

Table 3 presents the comparison between groups using an independent t-test, where the t-value was 8.45, with a p-value < 0.05 . This indicates a statistically significant difference in recovery scores, confirming that the experimental intervention had a positive effect on postoperative recovery (Table 3).

The association between recovery and demographic variables is presented in Table 4. Age was significantly associated with recovery ($\chi^2 = 6.32$, $p < 0.05$), whereas sex showed no significant association ($\chi^2 = 2.11$, $p > 0.05$). This suggests that age may influence recovery outcomes, whereas sex does not have a meaningful effect on this study population (Table 4).

Table 1. Distribution of patients by demographic variables.

Variable	Category	Frequency	Percentage
Age	30–40	10	16.7%
	41–50	18	30%
	51–60	20	33.3%
	61–70	12	20%
Gender	Male	38	63.3%
	Female	22	36.7%

Table 2. Postoperative recovery scores.

Group	Mean score	SD
Experimental group	78.4	6.2
Control group	62.1	7.5

Table 3. Comparison of recovery between groups.

Test	t-value	p-value
Independent t-test	8.45	<0.05

Indicates statistically significant improvement in the experimental group.

Table 4. Association between recovery and demographic variables.

Variable	Chi-square	p-value	Result
Age	6.32	<0.05	Significant
Gender	2.11	>0.05	Not significant

DISCUSSION

The findings of the study showed that patients who participated in early exercise demonstrated significantly better recovery outcomes than those who received routine care. Improved mobility, better respiratory function, and reduced fatigue were observed in the experimental group [7].

These findings are consistent with those of previous studies that reported that early mobilization after CABG enhances lung expansion, reduces postoperative complications, and improves functional independence. The present study also supports the idea that early physical activity helps reduce hospital stays and improve patient confidence during recovery [8].

However, demographic variables, such as age, are significantly associated with recovery, indicating that older patients may require more structured support during rehabilitation [9, 10].

CONCLUSION

The study concluded that early exercise is an effective intervention for improving postoperative recovery in patients who have undergone CABG. It enhances mobility, respiratory function, and overall functional independence, thereby promoting a faster recovery.

Nursing Implications

- *Nursing practice:* Nurses can integrate early exercise into routine postoperative care for patients undergoing CABG.
- *Nursing education:* Training programs should emphasize the importance of early mobilization in cardiac rehabilitation.
- *Nursing administration:* Hospitals should develop standardized protocols for early exercise after cardiac surgery.
- *Nursing research:* Further studies should explore the long-term outcomes of early exercise in different cardiac populations.

Limitations of the Study

- Small sample size limits generalization
- Study conducted in a single hospital setting
- Short duration of follow-up
- Limited to stable post-CABG patients only

Recommendations

- Early exercise should be made a standard part of post-CABG care protocols
- Larger studies with longer follow-up periods should be conducted
- Similar studies can be extended to multi-center settings
- Psychological outcomes of early exercise can also be explored
- Family involvement in rehabilitation should be encouraged

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