

# Assessment of Postoperative Risk Factors, Adherence to Medication and Lifestyle Changes in Post Cardiac Surgery Patients: Tertiary Care Centre Study

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## I. INTRODUCTION

Cardiovascular diseases remain the leading cause of morbidity and mortality globally however, the success of these surgeries extends beyond the operating room. Postoperative recovery is significantly influenced by the patient's awareness and management of risk factors, adherence to prescribed medications, and implementation of necessary lifestyle modifications.

Cardiac surgery is a critical intervention for managing severe cardiovascular conditions, yet its success heavily depends on addressing postoperative challenges. The need for this study arises from the growing recognition that post-cardiac surgery patients are at significant risk of both short- and long-term complications, which can be mitigated with proper knowledge, adherence to medications, and lifestyle changes. Despite advancements in surgical techniques and medical care, the success of cardiac surgery is heavily dependent on the patient's ability to manage their recovery and actively participate in their own health maintenance postoperatively.

**Postoperative Risk Factors Awareness:** Cardiac surgery patients are often unaware of the potential risks they face after surgery. Complications such as infection, bleeding, thromboembolism, and arrhythmias are common but can be minimized with timely interventions. However, lack of awareness about these risks may lead to delayed detection and improper management, affecting patient outcomes.

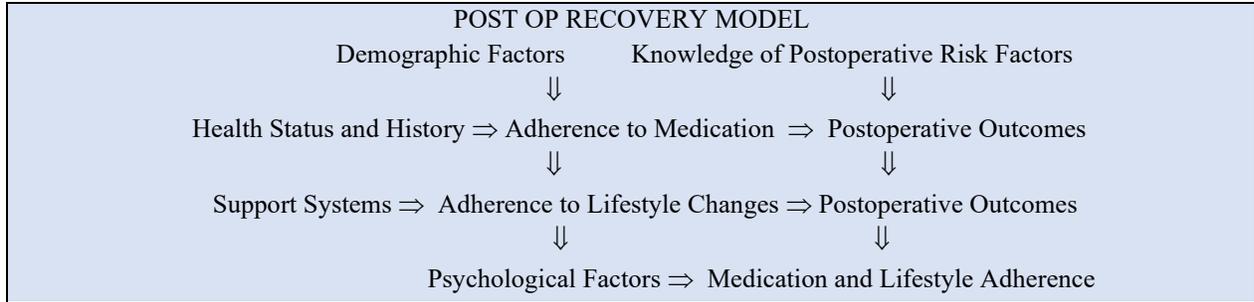
**Adherence to Medication:** Medications prescribed post-surgery, including antiplatelet drugs, anticoagulants, and blood pressure medications, are vital for preventing complications like graft failure, stroke, and myocardial infarction. Nonadherence to these medications is a major concern, and studies suggest that a significant proportion of patients do not follow their prescribed regimens due to various barriers, including misunderstanding of medication

importance, side effects, or lack of follow-up care. Without proper adherence, the risk of adverse outcomes increases, thus highlighting the need to evaluate the factors influencing medication compliance.

**Lifestyle Modifications:** Post-cardiac surgery patients are advised to make lifestyle changes, such as adopting a heart-healthy diet, engaging in regular physical activity, quitting smoking, and managing stress. However, the implementation of these changes can be challenging. Many patients face psychological, physical, or socio-economic barriers to making these lifestyle adjustments, which directly impacts their recovery and long-term cardiovascular health. Studies have shown that those who make significant lifestyle changes experience better outcomes, yet the extent of such changes and the challenges faced remain underexplored.

**Improvement in Patient Outcomes:** Understanding the levels of knowledge, adherence to medications, and lifestyle changes will provide essential insights into the gaps in patient education and care. Identifying the factors that influence these aspects can inform the development of targeted educational programs and interventions to improve compliance. Improved patient knowledge and adherence will likely lead to better management of postoperative risks, a reduction in complications, faster recovery, and a decrease in hospital readmissions.

**Public Health and Healthcare Resources:** By understanding the barriers to proper medication adherence and lifestyle changes, healthcare systems can allocate resources more effectively and design comprehensive postoperative care strategies. This can potentially reduce the burden on healthcare facilities by minimizing the occurrence of avoidable complications and readmissions, thus enhancing the overall efficiency of post-cardiac surgery care.



**II. AIM OF THE STUDY**

This study aims to assess the knowledge of post-operative risk factors, adherence to medication and lifestyle changes among post-cardiac surgery patients in selected tertiary care hospital in western Maharashtra.

**III. OBJECTIVES OF THE STUDY**

1. To evaluate the level of knowledge regarding postoperative risk factors among post-cardiac surgery patients.
2. To assess the degree of adherence to prescribed medications following cardiac surgery.
3. To determine knowledge about patients’ awareness and implementation of necessary lifestyle modifications for recovery and long-term health.

**IV. REVIEW OF LITERATURE**

Knowledge of postoperative risk factors in post-cardiac surgery patients  
 Salehi et al. (2017) conducted a study to assess the prevalence and predictors of non-adherence to health-promoting behaviors following coronary artery bypass graft (CABG) surgery, this descriptive cross-sectional study was done on 265 post-CABG patients in Iran using a structured questionnaire assessing adherence to diet, physical activity, and medication. The results showed that 45.7% of participants were non-adherent to diet, 40.8% to physical activity, and 26% to medication. Major factors associated with non-adherence included lack of knowledge, fatigue, and social or financial constraints, indicating a significant gap in postoperative education.

A study to evaluate lifestyle practices and quality of life among post-CABG patients in an Indian tertiary

care hospital by Sridharan et al. (2018) using structured lifestyle questionnaire and the SF-36 Quality of Life scale ]revealed that only 11.6% of the patients adhered to a healthy lifestyle, with high rates of uncontrolled hypertension (35%) and hyperlipidemia (48%). Furthermore, only 27.6% of patients reported good quality of life. The study emphasized the need for structured educational interventions to address poor awareness of risk factors and improve outcomes.

A randomized controlled trial was conducted on 70 patients, divided into intervention (peer education) and control (routine care) groups to compare the effect of peer education versus routine nursing education on lifestyle adherence in post-CABG patients, using a validated lifestyle adherence questionnaire showed a significant improvement in dietary and overall lifestyle adherence in the peer-educated group, with effect sizes ranging from  $\eta^2 = 0.482$  to  $0.671$  ( $p < 0.001$ ). The study concluded that peer-led sessions are effective in enhancing patient understanding of postoperative risk factors

**V. MEDICATION ADHERENCE POST-CARDIAC SURGERY**

Rouhi Balasi et al. (2015) conducted a cross-sectional study to explore the effect of patients’ beliefs on medication adherence six months after CABG in Iran, 217 patients were selected via systematic random sampling and completed telephone-administered questionnaires assessing socio-demographics, medication beliefs (via BMQ), and adherence (via MMAS-4). Although 81% reported adherence, the study found no statistically significant correlation between positive medication beliefs and actual adherence, suggesting other unmeasured factors influence medication-taking behavior.

Another study by Vaid et al. (2023) evaluated a tailored intervention aimed at improving medication adherence among CABG patients in a Delhi tertiary care hospital using a one-group pre-test/post-test design (n = 66), researchers used the MMAS before surgery and three months after implementing personalized counseling, medication reminders, and regimen simplification. Post-intervention, medication non-adherence significantly declined, and lipid profiles improved—demonstrating the effectiveness of individualized interventions in an Indian setting.

Knowledge of lifestyle changes in post-cardiac surgery patients

Gholami et al. (2020) conducted a quasi-experimental study in Iran to assess the impact of lifestyle education on knowledge and behavior among post-CABG patients. The findings showed a significant improvement in the intervention group's knowledge scores ( $p < 0.001$ ), indicating that structured education effectively enhances awareness and adoption of healthy lifestyle practices post-surgery.

The effect of a self-care training program conducted by Mahdi et al. (2021) on lifestyle behaviors among cardiac surgery patients in Egypt among 120 patients showed a marked improvement in patients' lifestyle behavior scores (mean difference of 2.3;  $p < 0.05$ ). The study concluded that focused lifestyle training significantly increases knowledge and adherence to recommended post-operative behaviors.

## VI. RESEARCH APPROACH- QUANTITATIVE DESCRIPTIVE

Research design -Cross sectional

Research setting- Tertiary care hospital in Western Maharashtra.

Target population-target population are post cardiac surgery patients admitted and attending follow-up at OPD within 1 year of surgery

Sample and sample techniques- The sample selected for the present study comprised of Post cardiac surgery patients admitted and attending follow-up at OPD within 1 year of surgery. A Purposive sampling Technique was used.

Inclusion criteria- Patients age  $> 30$  years, who underwent CABG or Valve replacement surgery, psychologically stable & willing to participate were included.

Exclusion criteria-Critically ill/ Ventilated patients & patients with congenital heart disease

Variables are defined as qualities, properties or characteristics of persons, things, or situation that change or vary or are manipulated or measured in a Research.

Demographic variables in the study are-Age, Gender , Educational level, Occupation, Marital status, Type of cardiac surgery, Time since surgery

Sample size- =40 calculated using formula  $N = [z^2 * p(1-p)] / e^2 / 1 + [z^2 * p(1-p)] / e^2 * N]$

Where,

- N is the population size
- z is the z-score
- e is the margin of error
- p is the standard of deviation

## VII. OPERATIONAL DEFINITIONS

Knowledge - The awareness and understanding of specific information, concepts, or skills related to a particular subject, measured through surveys, tests, or other assessments that gauge comprehension, recall, or application of that information in a given context.

Risk factors- Specific characteristics, behaviors, or exposures that are statistically associated with an increased likelihood of developing a particular disease or health condition, measured through health assessments, screenings, or self-reported data.

Adherence -The degree to which an individual follows a prescribed treatment plan, medication regimen, or health guideline, often measured by the percentage of prescribed doses taken, attendance at follow-up appointments, or self-reported compliance.

Lifestyle - The habitual patterns of behavior, activities, and choices an individual makes regarding diet, physical activity, sleep, and other health-related behaviors, typically measured by self-reported questionnaires, health surveys, or direct observation

Tool- Self-structured questionnaire consisted of Four sections:-

- i)-Section A- Demographic Data
- ii)-Section B- Knowledge about post op risk factors
- iii)-Section C- Knowledge about importance of adherence to medications
- iv)-Section D- Knowledge about lifestyle changes post cardiac surgery

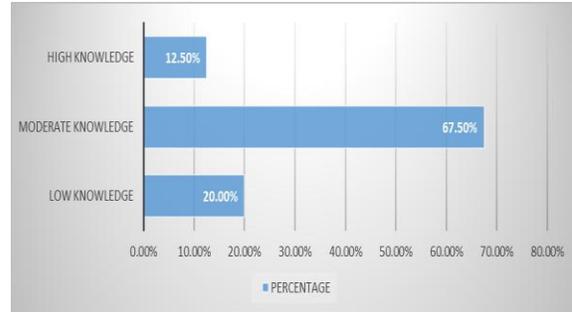
Ethical considerations: Approval was obtained from the institutional ethical committee. Permission was sought from the concerned authorities of the hospital, Written informed consent was obtained from each participant after explaining the study's purpose and procedures

VIII. RESULTS

Table1. Their socio-demographic profile is detailed in Table and summarized below.

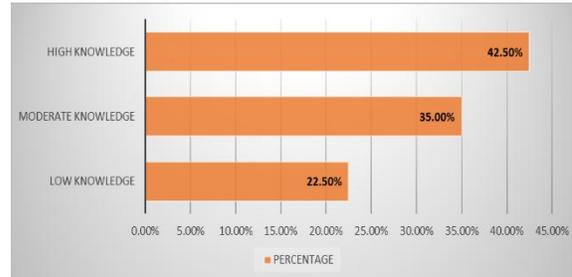
Socio-Demographic Variable	Frequency	Percentage
Age		
30-40 years	1	2.50%
41-50 years	5	12.50%
>50 years	34	85.00%
Gender		
Male	24	60.00%
Female	16	40.00%
Education		
No formal Education	10	25.00%
Primary	17	42.50%
Secondary	8	20.00%
Higher education	5	12.50%
Occupation		
Employed	6	15.00%
Unemployed	13	32.50%
Retired	21	52.50%
Marital Status		
Married	32	80.00%
Widowed	8	20.00%
Surgery type		
CABG	19	47.50%
Valve Surgery	21	52.50%
Time Since Surgery		
<1 month	1	2.50%
1-6 months	13	32.50%
>6 months	26	65.00%

The majority of the sample were more than 50 yrs of age, male and had primary level of education. Maximum were retired, married and underwent valve surgery who reported after 6 months of surgery. Knowledge of postoperative risk factors among post cardiac surgery patients



This figure1. represents knowledge of study participants regarding post operative risk factors. It depicts that 67.5% of study participants had moderate knowledge, 12.5% had high knowledge whereas 20% of the participants under study had low knowledge regarding the post operative risk factors.

Knowledge regarding adherence to medication



This Figure2. depicts knowledge of study participants regarding adherence to medication, 42.50% of the participants had high knowledge whereas 22.50% had low knowledge, 35% of the study participants had moderate knowledge regarding adherence to medication.

Knowledge regarding post operative lifestyle changes

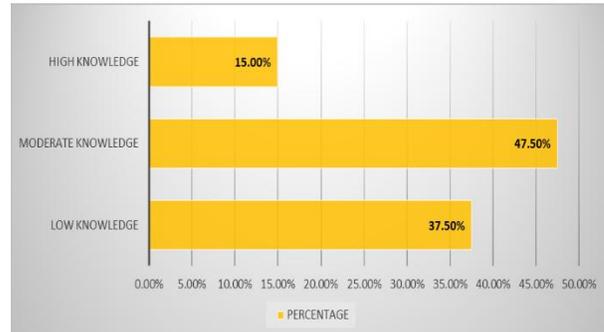


Figure 3 depicts knowledge of patients regarding post operative lifestyle modifications. 47.5% of the population had moderate knowledge, 15% had high knowledge whereas 37.5% of the population had low knowledge regarding the post operative lifestyle modification.

Majority of the population under study demonstrates moderate level of knowledge.

## IX. DISCUSSION

The findings of this study highlight that many patients lack adequate knowledge regarding postoperative risk factors. Limited understanding can lead to delayed recognition of warning signs such as chest pain, breathlessness, wound infection, or swelling. Studies in similar contexts show that improved patient education enhances early reporting of symptoms and reduces hospital readmissions. Medication adherence is a cornerstone of recovery. Non-adherence to anticoagulants, antiplatelets, beta-blockers, or statins can significantly increase morbidity and mortality after cardiac surgery. Common barriers include lack of awareness, side effects, financial constraints, and forgetfulness. The study results emphasize the need for continuous monitoring, counseling, and the use of reminders or follow-up calls to improve adherence. Sustainable lifestyle modification—such as a heart-healthy diet, physical activity, smoking cessation, stress reduction, and weight management—is essential to prevent recurrence of cardiac events. Despite awareness, many patients face challenges in implementing these changes due to cultural, psychological, or socioeconomic factors. Evidence suggests that structured cardiac rehabilitation programs significantly improve lifestyle compliance and long-term outcomes.

The study is limited to this geographical location and less sample size hence generalization of results is not possible.

## X. RECOMMENDATIONS

The study underscores the pivotal role of nurses and healthcare teams in educating patients pre- and post-surgery. Individualized teaching, use of visual aids, family involvement, and reinforcement during follow-ups are effective strategies. Nurses act as a bridge between physicians and patients, ensuring continuity of care.

### Implications in Nursing Practice

Nurses can play a crucial role in early identification of patients at risk for poor outcomes after cardiac surgery. Findings can guide the development of

individualized nursing care plans focusing on risk factor modification, medication adherence, and healthy lifestyle promotion. Nurses can implement structured discharge education programs (covering diet, exercise, medication schedules, and warning signs of complications). Encourages continuous follow-up (through outpatient visits or telehealth) to monitor patient compliance and reinforce lifestyle modifications. Supports the role of nurses as patient advocates and educators, ensuring better recovery and reduced readmission rates.

**Implications in Nursing Education** -The study highlights the need to integrate cardiac rehabilitation concepts, lifestyle modification, and adherence counseling into nursing curricula. Helps in training nurses on effective patient teaching strategies (e.g., motivational interviewing, behavioral change models).

**Implications in Nursing Research**-Provides a baseline for further research on factors influencing medication adherence and lifestyle changes in cardiac patients. Opens scope for interventional studies (eg, nurse-led education programs, mobile app-based follow-up) to evaluate impact on patient outcomes. Can be replicated in different settings (rural vs. urban, government vs. private hospitals) to compare knowledge and adherence patterns. Encourages mixed-methods research to explore patients' perspectives and barriers to adherence and lifestyle modifications, Contributes to evidence-based practice by linking knowledge improvement with clinical outcomes (reduced complications, hospital readmissions).

## XI. CONCLUSION

The study concluded that to improve outcomes for post-cardiac surgery patients, healthcare experts must focus on interventions that improve adherence to lifestyle modifications, as medication adherence alone is often insufficient for long-term health management and preventing secondary complications. Cardiac rehabilitation programs and educational interventions are effective strategies to improve both medication adherence and lifestyle changes.

### Conflict of Interests

The authors declare no conflict of interests. **Acknowledgments** The authors' heartfelt thanks are

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#### REFERENCES

- [1] Goldman S, Copeland J, Moritz T, Henderson W, Zadina K, Ovitt T, et al. Long-term graft patency (3 years) after coronary artery surgery. Effects of aspirin: results of a VA Cooperative study. *Circulation* 1994; 89: 1138-43.
- [2] Ford ES, Ajani UA, Croft JB, Critchley JA, Labarthe DR, Kottke TE, et al. Explaining the decrease in US deaths from coronary disease, 1980–2000. *N Engl J Med* 2007; 356: 2388-98.
- [3] Chobanian AV, Bakris G, Black H, Cushman W, Green L, Izzo J Jr, et al. National heart, lung, and blood institute joint national committee on prevention, detection, evaluation, and treatment of high blood pressure; national high blood pressure education program coordinating committee. The seventh report of the joint national committee on prevention, detection, evaluation, and treatment of high blood pressure: the JNC. *Hypertension* 2003; 7: 2560-72.
- [4] Smith SC, Benjamin EJ, Bonow RO, Braun LT, Creager MA, Franklin BA, et al. AHA/ACCF secondary prevention and risk reduction therapy for patients with coronary and other atherosclerotic vascular disease: 2011 update: a guideline from the American Heart Association and American College of Cardiology Foundation endorsed by the World Heart Federation and the Preventive Cardiovascular Nurses Association. *J Am Coll Cardiol* 2011; 58: 2432-46.
- [5] Naderi SH, Bestwick JP, Wald DS. Adherence to drugs that prevent cardiovascular disease: meta-analysis on 376,162 patients. *Am J Med* 2012; 125: 882-7.e1.
- [6] Ho PM, Magid DJ, Shetterly SM, Olson KL, Maddox TM, Peterson PN, et al. Medication nonadherence is associated with a broad range of adverse outcomes in patients with coronary artery disease. *Am Heart J* 2008; 155: 772-9.
- [7] Bhatt DL, Steg PG, Ohman EM, Hirsch AT, Ikeda Y, Mas J-L, et al. International prevalence, recognition, and treatment of cardiovascular risk factors in outpatients with atherothrombosis. *JAMA* 2006; 295: 180-9.
- [8] Mehta RH, Bhatt DL, Steg PG, Goto S, Hirsch AT, Liao C-S, et al. Modifiable risk factors control and its relationship with 1 year outcomes after coronary artery bypass surgery: insights from the REACH registry. *Eur Heart J* 2008; 29: 3052-60.
- [9] Foody JM, Ferdinand FD, Galusha D, Rathore SS, Masoudi FA, Havranek EP, et al. Patterns of secondary prevention in older patients undergoing coronary artery bypass grafting during hospitalization for acute myocardial infarction. *Circulation* 2003; 108: II24-8.
- [10] Horwitz RI, Viscoli CM, Donaldson R, Murray C, Ransohoff D, Berkman L, et al. Treatment adherence and risk of death after a myocardial infarction. *Lancet* 1990; 336: 542-5.