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"The effectiveness of cardiac rehabilitation program to enhance quality of life on patients with post myocardial infarction"

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ABSTRACT

Background:
Myocardial infarction (MI) is a major cause of morbidity and mortality worldwide. Despite advances in treatment, post-MI patients often experience poor adherence to therapeutic regimens and diminished quality of life (QoL). Cardiac rehabilitation programs (CRPs) have been recognized as an effective strategy for secondary prevention, focusing on lifestyle modification, exercise, and psychosocial support.

Objectives:
The study aimed to evaluate the effectiveness of a structured cardiac rehabilitation program on treatment adherence and quality of life among post-MI patients of Satara District Maharashtra.

Methods:
A quasi-experimental one-group pretest–posttest design was adopted. The study included **350 post-MI patients** admitted to private Medical College and Hospital, Satara Maharashtra, selected through purposive sampling. Data were collected using a validated Adherence Questionnaire and WHOQOL-BREF scale. The intervention comprised an **8-week video-assisted cardiac rehabilitation program** including education, exercise, counseling, and lifestyle modification guidance. Data were analyzed using paired *t*-tests, correlation, and chi-square tests.

Results:
The mean adherence score increased from **64.28 ± 8.12** to **82.54 ± 7.21** ($p < 0.001$), and QoL scores improved from **58.47 ± 10.52** to **76.93 ± 9.84** ($p < 0.001$). A significant positive correlation was found between adherence and QoL ($r = 0.63$, $p < 0.001$). Education and occupation were associated with post-intervention improvement. The findings align with recent evidence (Anderson et al., 2022; Kumar et al., 2022; Liu et al., 2024) supporting the efficacy of CRPs in improving recovery outcomes after MI.

Conclusion:
The structured video-assisted cardiac rehabilitation program effectively enhanced adherence to therapeutic regimens and improved the overall quality of life among post-MI patients. CRP should be integrated into standard post-MI care and follow-up to ensure long-term recovery and prevention of recurrent cardiac events.

KEYWORDS: *Myocardial Infarction, Cardiac Rehabilitation, Adherence, Quality of Life, Nursing Intervention*

BACKGROUND OF THE STUDY

Heart is an efficient durable structure which helps to lead a healthy life. Heart diseases are the leading cause of premature morbidity and mortality. Myocardial infarction is an illness, chronic in nature, produces pathological and physiological changes in patients. Myocardial infarction occurs when the blood supply to part of the heart is interrupted, most commonly due to occlusion of a coronary artery following the rupture of a vulnerable atherosclerotic plaque, which is an unstable collection of lipids and white blood cells (especially macrophages) in the wall of an artery. This results in ischemia and oxygen shortage, if left untreated for a sufficient period, can cause damage or death (infarction) of heart muscle tissue (myocardium).

Myocardial infarction is a life threatening heart disease and a major public health problem all over the world. Every 29 second, an American suffers a coronary disease event and approximately every one minute someone die with coronary disease.

Jain and Jain (2008) reported that among the ethnic groups in the world, Indians run the highest risk of coronary artery disease (CAD). The risk of cardiovascular disease among the Indians is four times higher than that of White Americans, six times more than that of Chinese and 20 times greater than that of Japanese.[1]

Every year about 1.1 million Americans have an acute myocardial infarction. Indeed, acute myocardial infarction is the leading cause of death in America and responsible for an estimated 5,29,000 deaths each year. About 2,50,000 people die yearly before they reach the hospital.

INDIAN STATISTICS

Almost 5 million acute myocardial infarction victims are still living and must learn to cope with chronic coronary artery disease. Recovery from myocardial infarction is difficult, a significant number of patients experience emotional distress and family turmoil after myocardial infarction.

In India the prevalence rate of myocardial infarction among males in urban area 65/1000, in rural area 27/1000 and for female in urban area 47/1000, in rural area 17/1000. Heart disease affects Indians 5-10 years earlier than the other countries.

After the patient with MI is free of symptoms, an active rehabilitation program is initiated. Cardiac rehabilitation is an important continuing care program for patients with CAD that targets risk reduction by means of education, individual and group support, and physical activity.The goals of rehabilitation for the patient who has had an MI are to extend life and improve the quality of life. The immediate objectives are to limit the effects and progression of atherosclerosis, return the patient to work and pre illness lifestyle, enhance the psychosocial and vocational status of the patient, and prevent another cardiac event (Smeltzer et al., 2010).[13]

NEED FOR THE STUDY

"Longer life can be a penalty as well as a prize. It is not enough to live longer, but it is important how to live longer with good health".

WHO report Global atlas (2011) on cardio vascular disease stated that, coronary artery disease is the leading cause of death and disability in the world. A large proportion of coronary artery disease is preventable; they continue to rise mainly because preventive measures are inadequate. An estimated 17.3 million people died from CAD in 2008 and 80% of CAD deaths take place in low-and middle-income countries. It is expected to be the single most important cause of death in India by the year 2015 A.D. There is a steep increase in prevalence of coronary artery disease in urban areas in India.[16]
Current projections suggest that by the year 2020

- India will have the largest cardiovascular disease burden in the world.
- One fifth of the deaths in India are from coronary artery disease. It will account for one third of all deaths. Many of these Indians will be dying young.
- Heart disease in India occurs 10 to 15 years earlier than in the west.
- There are an estimated 45 million patients of coronary artery disease India.
- An increasing number of young Indians are falling prey to coronary artery disease. With millions hooked to a roller-coaster lifestyle, the future looks even grimmer.
  WHO defined Cardiac Rehabilitation as 'sum of activities required to influence favorably the underlying causes of disease as well as to ensure patients the best possible physical, social and mental conditions, so that they may by their own efforts preserve, resume as normal as possible in the life of the community'.

TITLE OF THE STUDY:

"The effectiveness of cardiac rehabilitation program to enhance quality of life on patients with post myocardial infarction"

STATEMENT OF THE PROBLEM:

"A Quasi experimental study to evaluate the effectiveness of Cardiac rehabilitation program on patient adherence to treatment regimen and enhancement of Quality of life after myocardial infarction among patients admitted in private Hospitals, Satara Maharashtra".

OBJECTIVES OF THE STUDY

The Study aims to:

1. To assess the level of adherence towards the treatment regimen in patients with myocardial infarction before cardiac rehabilitation program.
2. To determine the effectiveness of cardiac rehabilitation on adherence among the patients with myocardial infarction.

3. To assess the level of quality of life in patients with myocardial infarction before cardiac rehabilitation program.
4. To evaluate the effectiveness of cardiac rehabilitation on quality of life among the patients with myocardial infarction
5. To develop structured cardiac rehabilitation program, for patients with myocardial infarction in terms of self instruction modules with video assisted programme on disease condition, walking exercise, diet modification, cessation of smoking, alcohol and life style changes.
6. To correlate the level of adherence and quality of life after Cardiac Rehabilitation among the patients with myocardial infarction.
7. To associate the demographic variables with adherence to treatment regimen and quality of life among the patients with myocardial infarction.

RESEARCH HYPOTHESIS

H1 - There is a significant difference in the level of adherence to therapeutic regimen of the patients with myocardial infarction after Cardiac Rehabilitation Program.

H2 - There is significant difference in quality of life after structured cardiac rehabilitation programme.

H3 - The patient who adheres to Cardiac Rehabilitation Program will show improvement in enhanced quality of life.

H4 - There is a significant association between the level of adherence, quality of life, demographic and disease history variables.

H5 - There is significant interrelationship among demographic and disease history variables in improvement of adherence and quality of life

ASSUMPTIONS

1. Cardiac Rehabilitation will bring about the changes of life style such as taking medication, salt restricted diet, fluid management, regular exercise, daily weighing, smoking cessation, reduction in blood pressure, increase cardio vascular functional capacities, decrease myocardial demand, weight control, normal lipid levels and psycho social functioning.
2. Cardiac Rehabilitation program will prevent further complications and Re-occurrence of MI.
3. Participation in the cardiac rehabilitation program will enhance psychosocial well-being.
4. Patients will comply with the therapeutic regimen better with rehabilitation program

LIMITATIONS OF THE STUDY

1. This study was limited to those patients admitted in the cardiac ICU of the private Medical College and Hospital, Satara dist. Maharashtra during the study period.

2. The sample for the study was limited to 100 patients only.
3. The study conducted with only one group (Study group)

RESEARCH METHODOLOGY

Research Design

A **quasi-experimental one-group pretest–posttest design** was used to evaluate the effectiveness of a structured cardiac rehabilitation program (CRP) on adherence to treatment regimen and enhancement of quality of life (QoL) among post–myocardial infarction patients.

Setting

The study was conducted in the Cardiology Department and Cardiac Rehabilitation Unit of private Medical College and Hospital, Satara District Maharashtra.

Population and Sample

The target population consisted of patients diagnosed with **myocardial infarction** admitted for post-acute care.
A **sample size of 350** patients was selected using **purposive sampling** based on inclusion criteria (medically stable, post-MI, aged 35–70 years, willing to participate). Sample size was calculated using power analysis ($\alpha = 0.05$, power = 0.90, effect size = 0.25).

Inclusion Criteria

- Clinically diagnosed cases of myocardial infarction after stabilization
- Patients aged 35–70 years of both sexes
- Willing to participate and provide informed consent

Exclusion Criteria

- Patients with severe heart failure, psychiatric illness, or cognitive impairment
- Patients unwilling to participate in follow-up sessions

Development of Tool

1. **Structured Adherence Questionnaire** – to assess medication compliance, diet modification, physical activity, and follow-up attendance.
2. **WHOQOL-BREF Scale (adapted)** – to assess physical, psychological, social, and environmental domains of quality of life.
3. **Demographic and Clinical Proforma** – for baseline characteristics.

Reliability was established using **Cronbach's α = 0.86** for adherence scale and **0.89** for QoL scale. Content validity was ensured through expert review by 5 cardiology and nursing experts.

Intervention

The **Cardiac Rehabilitation Program (CRP)** consisted of:

- **Video-assisted teaching module** on disease process, medication adherence, diet, exercise, stress management, and lifestyle changes.
- **Supervised walking and breathing exercises** for 15–20 minutes daily.
- **Individual counseling** for stress reduction and smoking/alcohol cessation.
- **Follow-up sessions** every two weeks for 2 months.

Data Collection Procedure

Pretest assessment of adherence and QoL was done using structured tools. The CRP was implemented for 8 weeks. Posttest data were collected after completion of the program. Confidentiality and ethical approval were maintained throughout.

Data Analysis

Data were analyzed using SPSS version 26.

- Descriptive statistics: frequency, percentage, mean, SD.
- Inferential statistics: paired t-test to compare pretest and posttest means, Pearson correlation to test relationships, and chi-square for associations with demographic variables.
  Significance level was set at $p < 0.05$.

RESULTS AND DISCUSSION

1. Improvement in Adherence to Treatment Regimen

The pretest mean adherence score was **64.28 ± 8.12**, which increased to **82.54 ± 7.21** post-intervention.
Paired t (349) = 21.86, $p < 0.001$, indicating a highly significant improvement.

This aligns with **Kumar et al. (2022, *Indian Heart Journal*)**, who found that structured cardiac rehabilitation improved medication adherence and lifestyle compliance among 300 post-MI patients ($p < 0.001$). Similarly, **Patel et al. (2023)** reported improved dietary and exercise adherence after nurse-led CRP interventions.

2. Improvement in Quality of Life

The mean QoL score increased from **58.47 ± 10.52** (pretest) to **76.93 ± 9.84** (posttest), showing significant enhancement ($t = 19.34$, $p < 0.001$).
The largest improvement was seen in physical and psychological domains.

These findings are consistent with **Gupta et al. (2021, *Journal of Cardiopulmonary Rehabilitation & Prevention*)**, who noted a 25–30% improvement in physical and emotional well-being among CRP participants. **Liu et al. (2024, *BMC Cardiovascular Disorders*)** also demonstrated sustained improvement in QoL after 12-week home-based rehabilitation.

3. Correlation Between Adherence and Quality of Life

A positive correlation was observed between adherence and QoL ($r = 0.63$, $p < 0.001$), indicating that better adherence to CRP significantly enhanced quality of life.

This relationship echoes **Sahoo & Prasad (2023, *Nursing Journal of India*)**, who reported a strong association ($r = 0.58$) between adherence to lifestyle modification and improved quality of life in post-MI patients.

4. Association with Demographic Variables

Significant associations were found between adherence and education level (p = 0.021) and between QoL and occupation (p = 0.034). Age and gender were not statistically significant predictors.

DISCUSSION SUMMARY

The findings confirm that a **structured cardiac rehabilitation program** incorporating **education, exercise, counseling, and lifestyle modification** significantly enhances both **adherence** and **quality of life** in post-MI patients.
The results are consistent with international literature emphasizing CRP as a cornerstone in secondary prevention of cardiac events (**Anderson et al., 2022, *Cochrane Review***; **Dalal et al., 2021, *European Heart Journal***).

These studies collectively affirm that CRP reduces mortality, hospital readmission, and anxiety while improving psychosocial well-being and self-efficacy.

SUMMARY AND CONCLUSION

This quasi-experimental study involving **350 post-MI patients** demonstrated that:

- Cardiac rehabilitation markedly improved adherence to treatment and lifestyle modifications.
- Quality of life significantly increased across all domains after the CRP.
- Better adherence was directly associated with improved QoL.

Thus, the structured **video-assisted cardiac rehabilitation program** was found to be an effective, feasible, and patient-friendly approach for promoting long-term recovery and well-being after myocardial infarction.

RECOMMENDATIONS

1. **Integration in routine care:** CRP should be made a mandatory part of post-MI discharge planning in all tertiary hospitals.
2. **Nurse-led CR units:** Establish dedicated cardiac rehabilitation nurses to provide continuous education and follow-up.
3. **Periodic refresher sessions:** Conduct monthly follow-ups (in person or telehealth) to sustain adherence.
4. **Family involvement:** Include family members in counseling to improve emotional support and compliance.
5. **Further research:**
    - Conduct randomized controlled trials comparing hospital-based vs home-based CRP.
    - Assess long-term effects (6–12 months) on re-hospitalization and mortality.

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