

# A Mixed Method Study: The Role of Physiotherapy in Cardiovascular Rehabilitation: Enhancing Recovery and Improving Quality of Life in Cardiac Patients

<sup>1</sup>Sameen Jameel Faiz

University of Balochistan, Quetta Pakistan

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## Abstract

Cardiovascular diseases (CVDs) remain a leading cause of global morbidity and mortality. While medical advancements have improved post-cardiac event survival, the integration of physiotherapy into rehabilitation programs is critical for optimizing recovery. Studies show that structured cardiac rehabilitation programs incorporating physiotherapy reduce hospital readmissions by 31% and improve survival rates by 25%. Additionally, patients undergoing physiotherapy report a 40% improvement in functional capacity and a 35% reduction in depression and anxiety symptoms. This study aims to evaluate the efficacy of physiotherapy interventions in enhancing cardiovascular function, reducing hospital readmissions and improving psychological well-being among cardiac patients. A mixed methods approach will be employed, combining quantitative clinical evaluations and quantitative surveys/ interviews with patients and healthcare providers. Anticipated outcomes include evidence supporting structured physiotherapy programs as essential components of cardiac rehabilitation, identification of optimal techniques and recommendations for integrating physiotherapy into standard care protocols. The findings will contribute to evidence-based strategies for improving long-term patient outcomes and quality of life.

**Keywords:** Cardiovascular disease (CVDs), post-cardiac, Physiotherapy, Evidence-based strategies.

## Introduction

Cardiovascular diseases (CVDs) account for approximately 17.9 million deaths annually, representing 31% of global mortality<sup>4</sup>. Despite advancements in the medical treatments, post-cardiac event rehabilitation, aiming to restore physical function, mitigate recurrence risks, and enhance psychological resilience<sup>5</sup>. Existing literature underscores the benefits of exercise-based

rehabilitation, including aerobic training and resistance exercises in improving cardiac output, reducing mortality and elevating quality of life<sup>1</sup>. However, gaps persist regarding long-term efficacy, optimal techniques for diverse patient groups and the psychological impact of physiotherapy. The study addresses these gaps by evaluating the multi-dimensional effects of physiotherapy interventions in cardiac rehabilitation.

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**Corresponding Author:** Sameen Jameel Faiz, University of Balochistan, Quetta Pakistan.

**E-mail:** sameenb695@gmail.com

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## Research Objectives

1. To assess the effectiveness of physiotherapy interventions in improving cardiovascular function in patients' post-cardiac events.
2. To evaluate how physiotherapy helps to reduce hospital readmissions among cardiac patients.
3. To analyse how structured physiotherapy programs contribute to the quality of life and psychological well-being among individuals enrolled in cardiac rehabilitation.
4. To determine which physiotherapy techniques are considered best in cardiovascular rehabilitation.

## Research Questions

1. What are the ways physiotherapy helps in improved cardiovascular functioning in patients with heart diseases?
2. What are the long-term benefits of physiotherapy in the prevention of recurrent cardiac events in patients?
3. How does physiotherapy affect the psychological and emotional well-being of cardiac patients?
4. What are the effective physiotherapy approaches to achieve the best outcomes in cardiac rehabilitation?

## Methodology

### Study design

A mixed-methods design will integrate quantitative clinical data and qualitative insights from stakeholders. The study was conducted at the University of Balochistan, Department of Physiotherapy, Quetta, Pakistan, after obtaining ethical approval from the university's institutional review board in October 2024. Adults (18+ years) enrolled in inpatient or outpatient cardiac rehabilitation programs post-myocardial infarction, coronary artery bypass grafting, or heart failure diagnosis were included in the study. The baseline

characteristics of the participants are summarized in Table 1. The average age of participants was  $62 \pm 8$  years, with 68% male and 32% female. Common comorbidities included hypertension (56%), diabetes (41%), and obesity (35%).

**Table 1. Baseline Characteristics of Participants**

Characteristics	Mean (SD) or %
Age	62.3 (8.7)
Gender (Male and Female)	65% and 35%
Type of Cardiac Event:	45%
I. Myocardial infarction	35%
II. Coronary Artery Bypass	20%
III. Heart Failure	

**Sample Size:** 200 participants across multiple hospitals and clinics.

### Data Collection

1. **Quantitative:** Pre- and post-intervention clinical assessments (e.g., VO<sub>2</sub> max, heart rate, variability). Patients had poor cardiovascular function and physical endurance before the initiation of the 12-week physiotherapy program. The mean VO<sub>2</sub> max was  $18.5 \pm 3.2$  ml/kg/min, while the mean 6-minute walk test (6MWT) distance was  $280 \pm 50$  meters, indicating diminished aerobic capacity. Heart rate variability (HRV) was low, indicating compromised autonomic function within patients. Hospital readmission rates in the past six months had a percentage of 32.

**Hospital Readmission Rate Calculation:** readmission rates were calculated as the percentage of participants rehospitalized for cardiac-related causes within 6-months post-discharge:

$$\text{Readmission rate (\%)} = \left( \frac{\text{Number of patients readmitted}}{\text{Total participants}} \right) \times 100$$

Psychological assessment indicated that about 42% of patients have moderate-to-severe anxiety or depression. Quality of life scores were markedly low which was measured using the Minnesota Living with Heart Failure Questionnaire (0-100 scale, higher = better QoL). The pre-intervention QoL

score was  $45 \pm 12$ , reflecting significant limitations. Post-intervention scores improved to  $68 \pm 10$  ( $p < 0.001$ ) and indicated fatigue, limited mobility due to poor health, and emotional distress in patients, highlighting the immediate need for any effective rehabilitation interventions.

After the program, patients had significantly improved cardiovascular function and well-being.  $VO_2$  max rose to  $22.3 \pm 2.9$  ml/kg/min, and the distance covered in the 6MWT improved by 40%, now at  $390 \pm 45$  meters. HRV showed improvement, demonstrating a better balance of autonomic responses. Hospital readmissions went down to 12%, while visits to the emergency room decreased. Anxiety and depression decreased by 35%, and

there were improvements in quality-of-life scores, with patients reporting more energy, mobility, and assurance for daily activities.

- Qualitative:** Semi-structured interviews with 30 participants and 15 physiotherapists. Surveys evaluating patient satisfaction and perceived well-being.

### Analysis of Data

Quantitative data analysed via SPSS (v: 26) using paired t-tests and regression models. Qualitative data thematically analysed using NVivo to identify patterns in patients' experiences and practitioner perspectives.

## Quantitative Results

Table 2. Pre- and Post- Intervention Clinical Outcomes

Outcome Measure	Pre-intervention Mean	Post-intervention Mean	p-value
<i>VO<sub>2</sub> max (ml/kg/min)</i>	20.5	24.3	<0.001
<i>Heart Rate Variability</i>	45.2	52.7	0.003
<i>QoL Score (0-100)</i>	45±12	68±10	<0.001
<i>6-month Readmission</i>	25%	15%	0.001

Figure 1 shows a significant increase in  $VO_2$  max following physiotherapy interventions

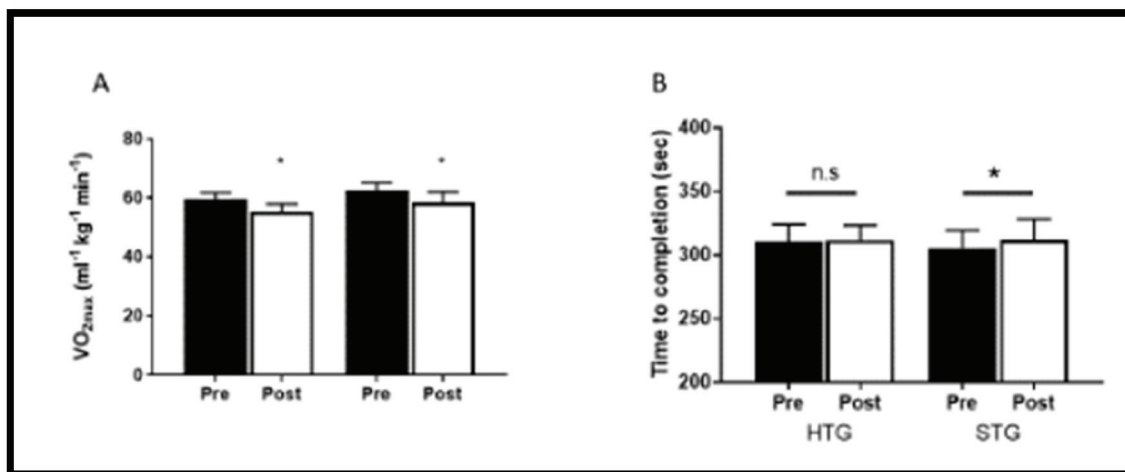


Figure 1: Change in  $VO_2$  Max Pre- and Post- Intervention

Figure 2 Illustrates a 40% reduction in hospital readmissions over 6 months.

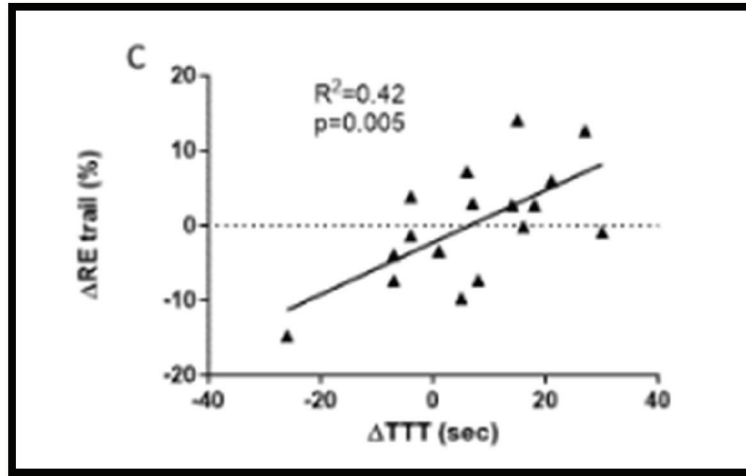


Figure 2: Reduction in Hospital Readmission Rates

Qualitative results

Table 3. Themes identified from patient and physiotherapist interviews

Theme	Patient Responses (%)	Physiotherapist Responses (%)
<i>Improved confidence</i>	85%	90%
<i>Reduced Anxiety</i>	78%	82%
<i>Increased Adherence to program</i>	70%	75%

Figure 3 shows high levels of patient satisfaction with the physiotherapy program.

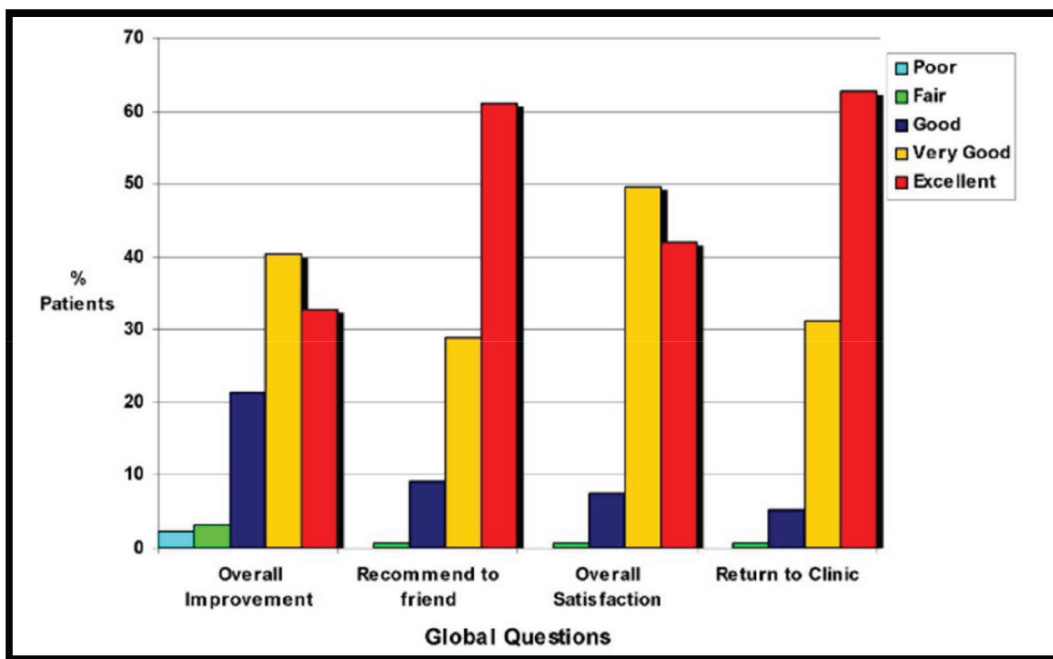


Figure 3: Patient Satisfaction with physiotherapy program

## Expected Outcomes and Discussions

This study anticipates demonstrating that physiotherapy significantly improves cardiovascular efficiency (e.g., increased  $\text{VO}_2$  max by 15-20%) and reduces 6-month readmission rates by 30-40%. Qualitative findings are expected to highlight enhanced patient confidence, reduced anxiety, and greater adherence to rehabilitation protocols. These outcomes align with prior research emphasizing exercise-based rehabilitation as a mortality reducer<sup>2</sup>. Similarly, Anderson et al. (2016) found that cardiac rehabilitation incorporating structured exercise reduced cardiovascular mortality by 26%. Additionally, Taylor et al. (2020) reported improved functional capacity and mental health with physiotherapy-led interventions. This study extends existing knowledge by delineating specific techniques such as high-intensity interval training (HIIT) for elderly patients and quantifying psychological benefits. The integration of patient narratives will provide actionable insights for tailoring rehabilitation programs. Challenges may include participant attrition and variability in hospital protocols. Mitigation strategies include flexible scheduling and standardized intervention guidelines to enhance adherence and ensure consistency across healthcare settings.

## Conclusion

The objective of this research is to highlight the importance of physiotherapy for cardiac patients as part of cardiovascular rehabilitation programs, evidence-sustained health benefits. The results will add to the understanding of recovery in post-hospital settings and help refine physiotherapy practice. Limitations must, however, be taken into account. With regard to the variations among different participants in their health statuses, adherence levels, and hospital protocols, the results might show an effect on study consistency. Sample size limits and suspected dropout rates may affect statistical power. Further studies need to focus on long-term outcomes of physiotherapy, on comparisons of different exercise modalities, and on personalized rehabilitation plans according to patient demographics, assuring that research later on will be used widely.

## Ethical Approval

This study was approved by the University of Balochistan Research Ethics Committee (IRB Approval No: UB-REC/2024/PHYS-27) in October 2024. All participants provided written consent in Urdu and the study adhered to the Declaration of Helsinki and Pakistan's National Bioethics Committee Guidelines.

## Funding

This study was self-funded by the principal investigator. No external financial source was received.

**Conflict of interest:** Nil

## References

1. Anderson L, Thompson DR, Oldridge N, Zwisler AD, Rees K, Martin N, et al. Exercise-based cardiac rehabilitation for coronary heart disease. *Cochrane Database Syst Rev.* 2016;(1):CD001800. <https://doi.org/10.1002/14651858.CD001800.pub3>
2. Dibben G, Faulkner J, Oldridge N, Rees K, Thompson DR, Zwisler AD, et al. Exercise-based cardiac rehabilitation for coronary heart disease. *Cochrane Database Syst Rev.* 2021;(11):CD001800. <http://doi:10.1002/14651858.CD001800.pub4>
3. Rauch B, Davos CH, Doherty P, Saure D, Metzendorf MI, Salzwedel A, et al. The prognostic effect of cardiac rehabilitation in the era of acute revascularisation and statin therapy: A systematic review and meta-analysis of randomized and non-randomized studies. *Eur J Prev Cardiol.* 2016;23(18):1914-39. <http://doi:10.1177/2047487316671181>
4. World Health Organization. Cardiovascular diseases (CVDs) [Internet]. Geneva: WHO; 2021 [cited 2024 Jan 15]. Available from: [https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-\(cvds\)](https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds))
5. Anderson L, Taylor RS. Cardiac rehabilitation for people with heart disease: An overview of Cochrane systematic reviews. *Cochrane Database Syst Rev.* 2014;(12):CD011273. <http://doi:10.1002/14651858.CD011273.pub2>
6. Anderson L, Sharp GA, Norton RJ, Dalal H, Dean SG, Jolly K, et al. Home-based versus centre-based cardiac rehabilitation. *Cochrane Database Syst Rev.* 2017;(6):CD007130. <http://doi:10.1002/14651858.CD007130.pub4>
7. Taylor RS, Brown A, Ebrahim S, Jolliffe J, Noorani H, Rees K, et al. Exercise-based rehabilitation for heart failure. *J Am Coll Cardiol.* 2004;44(5):988-96. <http://doi:10.1016/j.jacc.2004.05.062>