

Impact of Diabetes on Cardiac Rehabilitation Outcomes

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Introduction: Cardiac rehabilitation (CR) has long been indicated for patients recovering from coronary heart disease (CHD).

Significance: CHD is the leading cause of death in patients with diabetes mellitus (DM).

Purpose: We assessed if there were differences in CR outcomes in patients with DM compared to those without DM.

Design: A cross-sectional study design was used to analyze patient outcomes from 145 CR facilities participating in the Montana Outcomes Project (MOP) from 22 states. From October 2012 through June 2014, there were 16,432 adults completing Phase II visits in CR programs. We compared CR outcomes of patients with DM (26.8%) to those without DM.

Methods: Data were collected using an Excel spreadsheet and reported quarterly. Descriptive statistics were calculated for all response variables. Statistical analysis included Paired T-test, Chi-square and ANOVA tests with p-value of ≤ 0.05 indicating statistical significance.

Results: Patients attended an average of 26.7 (SD: 9.19) sessions. Patients with DM were slightly older (67.4 vs. 66.9 years, $p < 0.024$), non-white (9.9% vs. 5.4%), and Hispanic (4.7% vs. 2.8%) compared to those without DM. Patients without DM were significantly more likely to have blood pressure at target ($< 140/90$ mmHg) pre-CR (86% vs. 90%) and post-CR (90% vs. 92%) compared to patients with DM. Most CR-patients had body mass index (BMI) ≥ 25.0 kg/m² (90% with DM and 75% without DM). Patients with DM were less likely to be referred for MI/PCI and valve replacement/repair and more likely to be referred post-CABG than patients without DM. After CR, patients with and without DM showed significant improvements in quality of life (SF-36), functional capacity (Duke Activity Status Index) and depression scores (PHQ-9). Patients without DM showed significant improvements in functional capacity compared to patients with DM (mean difference: 1.77 vs. 1.56 METs). Patients with DM showed greater improvement, although not significant ($p = 0.08$) in depression scores compared to patients without DM (mean difference: 2.29 vs. 2.15).

Conclusion: Our findings confirm that patients with DM had lower functional capacity at the initiation of CR compared to patients without diabetes. Patients with DM were also more likely to have a BMI > 25.0 kg/m² and have higher depression scores compared to those without DM. Quality of life and depression scores as well as functional capacity improved in all participants regardless of DM status.

Implications: With the large sample from multiple CR programs, we were able to show benefits for subsets of patients with DM with the most common referring diagnoses.