

The Dose-Response Effects of Cardiac Rehabilitation on Exercise Capacity and Health Outcomes in Cardiac Patients

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Introduction: A large body of evidence suggests that more physical activity (PA) results in greater health and fitness outcomes. Despite these findings, however, a large population adopts sedentary behaviors which are strongly associated with an increased risk of cardiovascular disease (CVD) and mortality.

Purpose: The purpose of the current study was to evaluate the relationship between the number of completed Cardiac Rehabilitation (CR) sessions, exercise capacity and health related outcomes in a group of cardiac patients.

Significance: Within the next 20 years, the cost of CVD is expected to triple. Secondary prevention strategies that include exercise-based CR sessions may help reduce the risk of CVD, risk of recurrent cardiovascular events, and associated financial burden.

Design: The current investigation was a retrospective cohort study.

Methods: Data from forty-eight adults (Mean \pm SD: 64.8 \pm 13.0 yrs; 174 \pm 10.0 cm; 84.8 \pm 15.6 kg; 27.8 \pm 3.9 BMI) participating in phase II CR were used in the analyses. All participants voluntarily enrolled in CR which consisted of clinically-supervised exercise training and diet and PA education for up to 36 sessions. Participants were categorized within a Low (3-12 sessions), Moderate (13-24 sessions), and High Compliance (24-36 sessions) group depending on how many CR sessions were completed. Dependent variables included peak exercising METs (PE_{METS}), exercise time (ET), resting heart rate (RHR), exercise HR (ERH), resting systolic and diastolic blood pressure (SBP and DBP, respectively), exercise SBP and DBP, and body weight (BW, kg). Pre/post data were analyzed using paired *t*-tests for participants within each exercise group. To mitigate potential inflation of the overall Type I error rate, a Bonferroni correction factor was applied to the statistical comparisons, resulting in a *p*-value of < 0.006 required for determining statistical significance.

Results: Within the Low Compliance group, ET was statistically improved between measurements (*p*-value < 0.006). The Moderate Compliance group resulted in statistically significant improvements for ET (*p*-value < 0.006) and PE_{METS} (*p*-value < 0.006). Exercise time, PE_{METS}, EHR and BW were all significantly improved between measurements for the High Compliance group (*p*-value < 0.006).

Conclusions: The results of the current study suggest that 25-36 CR exercise sessions confer the greatest benefits when compared to less than 25 CR exercise sessions.

Implications: These findings add to a body of evidence suggesting that more PA is better than less. Further, these results can aid in patient education highlighting the importance of program compliance and PA behaviors.