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Health Coaching to Maintain or Improve Physical Activity and Physical Function Post-Structured Cardiac Rehabilitation Programming Among Older Adults: A Pilot Study

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INTRODUCTION

Cardiovascular disease is the leading cause of death for men and women in the United States.[1,2] Cardiac rehabilitation (CR) is crucial for individuals recovering from a heart attack, valve replacement, or heart failure, among other heart problems that require surgery or medical care.[2] However, post-CR physical activity (PA) often declines, with only 15% of individuals remaining physically active six months following CR.[3,4] This decline is more pronounced among older adults due to safety concerns and age-related health conditions.[5,6] Targeting the transition period post-CR with a behavior change intervention may promote long-term PA maintenance among this older adult population. Thus, the Target-CR pilot study aimed to assess the feasibility of health coaching (HC) versus education (E) to maintain or improve PA and physical function post-CR among older adults.

METHODS

STUDY DESIGN.

The Target-CR study (NCT05773287) enrolled participants who completed traditional insurance-covered CR and was approved by the Duke University Institutional Review Board

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(Pro00112929). Participants were recruited between September 2023 and March 2024. All participants provided written informed consent.

PARTICIPANTS.

Potential participants (n = 146) were pre-screened for eligibility using electronic health records for age and diagnosis. Of these, 52 were contacted, 15 met the inclusion criteria, and 13 enrolled. Inclusion criteria included: 1) willingness to provide informed consent; 2) ability to read and speak English; 3) ≥ 60 years old; 4) diagnosed with coronary heart disease; 5) of adequate clinical stability to allow study participation; and 6) own a smartphone/tablet. Exclusion criteria included: 1) planned relocation; 2) scheduled medical procedures; 3) decompensated heart failure; 4) heart failure – class IV; 5) severe pulmonary hypertension; 6) end-stage renal disease; 7) cardiac transplantation; 8) impairment from stroke, injury, or other medical condition; 9) dementia; 10) any other illnesses that, in the opinion of the local clinician, would negatively impact or mitigate participation; 11) hospitalization for any psychiatric condition within one year or Mental Health Screening Questionnaire score >4, if not currently in treatment; and 12) inpatient substance abuse rehabilitation program participation within one year.

INTERVENTION.

Participants were randomized into two groups for three months: 1) health HC, or 2) E. Both groups received a Garmin Vivosmart 5 device and a step goal ranging from 5,000-8,000 steps per day based on their baseline step count.[7,8] The E group received one 30-min education session, while the HC group received six HC sessions lasting 30 to 60 min.

MEASUREMENTS.

Anthropometrics, self-report PA, and physical function were assessed by trained staff members at baseline and three months. Steps per day were continuously monitored using the Garmin device. Satisfaction with the intervention was evaluated at three months.

STATISTICAL ANALYSIS.

Data was analyzed using JMP Pro v.17.0 (SAS Institute, Cary, North Carolina, USA). A p-value of <0.05 was considered significant. Paired and independent t-tests were used to assess changes in outcomes pre- and post-intervention.

RESULTS

Participants were on average 70.8 ± 7.0 years old, white (84.6%), and female (61.5%). All 13 participants who were randomized completed the intervention, achieving a 100% retention rate. Participants change in average daily step count from baseline to post-intervention was 1194 ± 1641 and 545 ± 1762 in the HC and E groups, respectively (post-intervention minus baseline). Adherence to step goals was 110.4% ± 26.8% and 102.7% ± 18.1% for the HC and E groups, respectively (Figure 1).

On average, participants in both groups improved or maintained measures of physical function from the Senior Fitness Test, specifically chair stands (Δ: 2.0 ± 2.4; $p = 0.015$),2)

arm curls (Δ: 2.0 ± 2.0; p = 0.005), and two-minute steps (Δ: 4.8 ± 7.3; $p = 0.043$). Waist circumference significantly improved (Δ: −3.3 ± 4.4 cm; $p = 0.019$), with weight and BMI trending toward a significant improvement (Weight: $p = 0.091$; BMI: $p = 0.090$). No significant differences were found between groups across outcomes.

Participants rated study enjoyment (scale from 0 to 10) at 9.3 ± 1.1 and 8.7 ± 2.2 in the HC and E groups, respectively. The greatest challenges to maintaining PA at the end of the study were lack of time (25%) and family or caregiving responsibilities (25%) for the HC group, and lack of motivation (25%) for the E group.

DISCUSSION

The Target-CR pilot study demonstrated the feasibility of using HC or E to maintain or improve PA and physical function post-CR among older adults. Suggesting there is a potential for continued improvement in outcomes after CR completion. The HC group averaged approximately 500 more steps per day than the E group at three months. Compared to previous trials aiming to maintain PA following CR, our study sample was older (70.8 years old) and with a greater proportion of women (61.5%).[9,10] Given women and older adults are less likely to be physically active in general, in combination with the small sample size, this could explain why no significant differences were observed between groups.

Barriers to PA maintenance after CR for the HC group included lack of time and caregiving responsibilities; in contrast, the E group reported a lack of motivation most often. This difference may suggest HC maintains motivation to continue participation in PA once CR is complete; however, future studies should examine whether this finding persists in a larger and more generalizable sample size.

We recognize several challenges and limitations of this study. First, wrist-worn accelerometry does not capture all types of PA, such as swimming or cycling. Moreover, older adults tend to have varying gaits and gait speeds, which could alter the accuracy of steps per day captured. Second, most participants in this study received a bachelor's degree or higher education, which may bias findings. Third, the behavior change process is cognitively intense, especially for older adults. Varying degrees of cognitive function among this older population may have impacted participant understanding and engagement within the health coaching sessions.

In conclusion, this pilot study provided valuable insights into the feasibility and potential benefits of HC and E to maintain or improve PA and physical function post-CR. Future studies should build on these findings, exploring ways to optimize intervention delivery and expand the reach to diverse populations.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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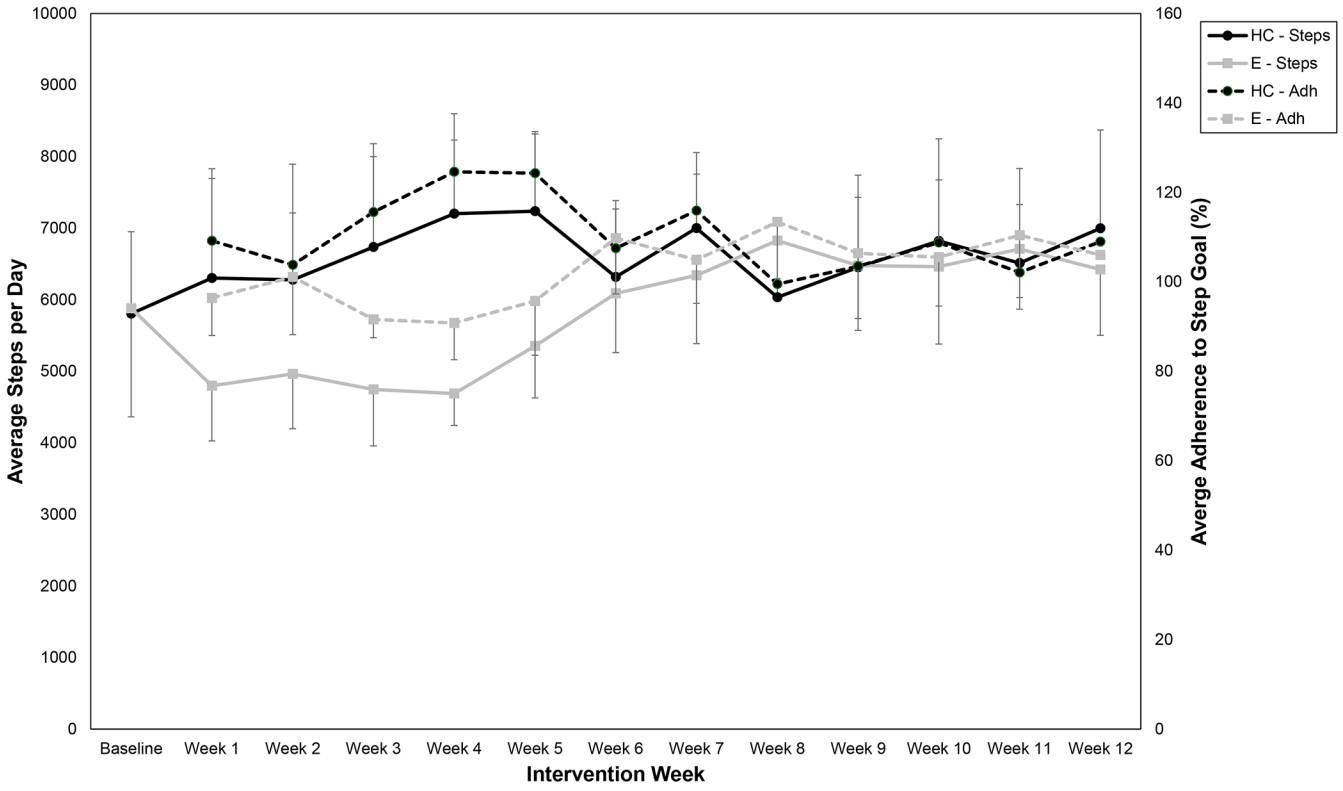

Figure 1.

Left Y-Axis: Average steps per day by intervention week across the 3-month study by group; ***Right Y-Axis*****:** Average adherence to step goal by intervention week across the 3-month study by group. E = education group; HC = health coaching group.