

Systematic Review of eHealth-Based Interventions on Adherence to Components of Cardiac Rehabilitation

The following is a synopsis of "Effects of eHealth-Based Interventions on Adherence to Components of Cardiac Rehabilitation: A Systematic Review," published in January/February 2020 in the *Journal of Cardiovascular Nursing*.



Cardiac rehabilitation (CR) is an outpatient model of secondary preventive care that can be delivered in clinical settings and in nonclinical settings based in the home and community.¹ CR provides many well-established benefits for patients, but unfortunately majority of eligible patients do not enroll in any CR program, regardless of its setting. Programs such as eHealth, telemedicine, and telehealth provide an alternative opportunity for patients who cannot participate in traditional CR programs. Many factors may contribute to a patient's inability to participate in a conventional CR program, including the program's incompatibility with the patient's needs or schedule, long travel times, and lack of transportation.^{2,3}

Poor patient adherence is one of the greatest challenges facing any type of CR program. Health inequities and the social determinants of health play a role in the poor adherence and high dropout rates in CR programs—the authors of the paper note that poor adherence is associated with lower educational level, lack of social support, high burden of family responsibilities, economic challenges, lack of or limited health insurance, and patient age. It is critical to consider patient adherence rates in evaluating the effectiveness and acceptability of eHealth-based CR intervention

What is added by this article?

In accordance to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses statement, the authors conducted a systematic review to determine the effects of eHealth-based interventions on patient adherence to CR components. Adherence outcomes were related to medication, diet, weight, fluid intake, and physical activity level.⁴

A literature search was conducted for studies published from January 1996 to December 2017, using seven electronic databases: Medline, Embase, CINAHL, EBSCO, Web of Science, the Cochrane Database of Systematic Reviews, and Cochrane Central databases. The terms used for the search included health information technology, cardiac rehabilitation, adherence, and compliance. For this study, the terms adherence and compliance were used interchangeably. The inclusion criteria were prospective studies, randomized controlled trials (RCTs), and pilot studies. The studies were required to be in full text and indicate that they evaluated adherence/compliance as a primary or secondary outcome. The exclusion criteria were (1) studies in which adherence was solely defined as attendance, participation, and enrollment in a CR program; (2) studies not reported in English; (3) primary prevention studies; (4) interventions not delivered by health care professionals; (5) qualitative studies; and (6) posters, abstracts, or conference papers.

After an extensive screening of 1,498 articles, 1,393 articles were excluded from the review, with 105 retrieved for a full review. The authors completed an in-depth analysis of 15 RCT studies, mostly introduced in a home-based setting, with sample sizes ranging from 19 to 382 and duration of follow-up ranging from 30 days to 1 year. Five studies were conducted in the United States, seven in Europe, and one each in Canada, New Zealand, and Jordan.

Telemonitoring and web-based applications for self-care behaviors were found to be most effective in promoting adherence to directions involving medication, diet, weight, physical activity, fluid restriction, smoking, and alcohol consumption.



Of the 15 studies, seven reported significant improvements in adherence using eHealth components of CR via a short message system or general messages, step counters, video education, telemonitoring and web-based applications for self-care behaviors, and telephone feedback with accelerometer use.

Most of the studies used medication adherence as the main outcome measure evaluated, but it was difficult to compare components of CR given differences in outcome measures (e.g., electronic pill cap monitor, Medication Adherence Rating Scale, self-reports). A meta-analysis found an 18% increase in medication adherence for patients with chronic diseases. Three out of four studies that used the Mobile Phone Use Questionnaire to evaluate feasibility and patient satisfaction found satisfaction was significantly higher in the intervention group.

Most of the studies failed to consider the effects of psychological distress, depression, or anxiety on adherence. The review observed variations in results of adherence to eHealth-based interventions, but overall, the studies found that eHealth interventions had a positive effect on adherence.

Intervention cost needed to be approximately \$335 for Medicare, \$35 for Medicaid, and \$180 for private insurance payers for patients in group 1. For patients in group 2, cost neutrality was achieved at \$585 for Medicare, \$70 for Medicaid, and \$220 for private insurance payers. Group 3 achieved cost neutrality at \$585 for Medicare, \$55 for Medicaid, and \$230 for private insurance payers.

What are the implications of these findings?

To increase access for the eligible population and promote patient adherence, eHealth-based CR interventions can be used as an alternative in a home-based setting or in combination with a traditional CR program.

Communication methods such as brief telephone calls, postcards, a short message system, or email could be used to increase patient motivation. With cardiovascular disease outcomes often affected by mental health issues such as

anxiety and depression, CR provides an appropriate time to diagnose emotional disorders and help patients cope with the challenges of coronary heart disease. In the design and implementation of eHealth-based interventions in CR programs, the use of behavior change theories such as behavioral and cognitive behavioral theory can enable clinicians to support proven evidence-based strategies and provide the framework for patient-centered interventions.



The authors could not draw strong conclusions about the effectiveness of eHealth on adherence due to variations in how the studies measured adherence for the same outcome. To evaluate all components of eHealth-based CR, future studies should set baseline and threshold measures based on validated scales for adherence. Nonetheless, eHealth-based interventions present an opportunity to help patients make significant lifestyle changes that improve their physical, mental, and social well-being.

Resources:

Centers for Disease Control and Prevention:
[Million Hearts Cardiac Rehabilitation Change Packet](#)

References

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Citation

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