



Clinical Impact of Digital Health Education for Patients with Heart Failure: A Systematic Review and Meta-Analysis

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INTRODUCTION

Heart failure (HF) is a major global health problem associated with substantial morbidity, mortality, and frequent hospital readmissions.

Digital health education interventions may improve patient self-management and clinical outcomes in HF.

Evidence across studies is inconsistent, with substantial variability in reported outcomes.

A comprehensive systematic review and meta-analysis evaluating the impact of digital health education interventions in HF has not yet been conducted.



METHODS

Study design: Systematic review and meta-analysis conducted according to **PRISMA 2020** guidelines.

Databases searched: PubMed and manual reference searches.

Search timeframe: January 2015 – June 2025.

Search keywords: *heart failure, digital health, digital education, mobile applications, tele-education, web-based interventions, and digital therapeutics.*

Studies included: Randomized controlled trials (RCTs) in adults with HF evaluating digital health education interventions delivered via mobile apps, web-based platforms, tele-education, or digital therapies, reporting outcomes such as all-cause mortality, hospital readmission, or health-related quality of life (HRQoL).

Methods



Systematic review and meta-analysis of **26 RCTs**

Results



All-Cause Mortality
-20%



Hospital Readmission
-12%



HRQoL
+4,1 points

RESULTS

26 randomized controlled trials (**RCTs**) involving diverse international HF populations

All-cause mortality

- Digital health education interventions significantly reduced mortality compared with standard of care (**RR = 0.80; 95% CI: 0.66–0.97; p = 0.02**).

Hospital readmissions

- Intervention groups demonstrated a lower risk of readmission (**RR = 0.88; 95% CI: 0.79–0.99; p = 0.03**).

Health-related quality of life (HRQoL)

- Modest overall improvement was observed (**MD = 4.11; 95% CI: 0.98–7.25; p = 0.01**), particularly in Minnesota Living with Heart Failure Questionnaire scores and self-care behavior domains.

Key Messages

- Digital health education reduces mortality and readmissions
- HRQoL shows modest improvements, particularly in self-care domains



STUDY AIM

To examine the **impact** of digital health education interventions on all-cause **mortality**, **hospital readmissions**, and health-related quality of life (**HRQoL**) in adults with HF.



CONCLUSION

Digital health education improves outcomes in heart failure by reducing mortality and hospital readmissions while modestly improving quality of life, supporting its integration into routine multidisciplinary HF care.