



Effects of self-management on self-efficacy, self-management behavior, and physiological and psychological effects on patients with heart failure: A systematic review and meta-analysis

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Background and objective

Heart failure is a chronic, progressive condition associated with substantial physical and psychological symptom burden, reduced quality of life, frequent hospitalizations, and increased mortality. Although **self-management** is essential in HF care, limited evidence has focused specifically on **interventions grounded in self-efficacy theory** and their impact on key clinical and behavioral outcomes.

Methods

PRISMA flow diagram of study selection 2020

Search methods
P: "heart failure" OR "congestive heart failure"
I: "self-management*" OR "self-efficacy"
S: "randomized controlled trial" OR "RCT"

Database
Chinese: Airiti Library,
Index to Taiwan Periodical Literature System
English: CINAHL, Cochrane Library,
Embase, PubMed

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Inclusion criteria
Randomized controlled trials involving heart failure patients, interventions based on self-management programs incorporating self-efficacy components, comparisons with usual care, and outcome measures including self-efficacy, self-management behaviors, and physiological and psychological outcomes. Studies published in Chinese or English were included.

Exclusion criteria
Comprised interventions combining self-management with other methodologies (e.g., cognitive behavioral therapy or health belief model), protocols only, non-peer-reviewed journal articles, conference papers, and master's or doctoral theses

Study quality
1. Cochrane risk-of-bias tool for randomized trials (RoB 2.0, 2019)
2. Inter-rater consistency analyzed using kappa statistics.

Evidence level Grading of Recommendations Assessment, Development, and Evaluation (GRADE) system.

Table 1. Risk Assessment of Deviations in Self-Efficacy

Authors/ year	D1	D2	D3	D4	D5	Overall
邵、葉、2010	!	+	+	!	+	i
Chen et al., 2021	+	+	!	!	+	i
Clark et al., 2015	+	+	!	!	+	i
Pozehl et al., 2010	!	+	+	!	+	i
Sarhadi et al., 2023	+	!	+	!	+	i
Sezgin et al., 2017	+	+	+	!	+	i
Shao et al., 2013	+	+	+	+	+	+
Smeulders et al., 2010	!	+	!	!	+	i
Srisuk et al., 2017	+	+	+	!	+	i
Young et al., 2016	+	+	+	!	+	i

Domains: D1: Bias arising from the randomization process ; D2: Bias due to deviations from intended intervention ; D3: Bias due to missing outcome data ; D4: Bias in measurement of the outcome ; D5: Bias in selection of the reported result. + Low risk ! some concerns risk

Results

Fifteen RCTs met the inclusion criteria. Compared with usual care, self-efficacy-based interventions produced significant improvements in self-efficacy (SMD 1.11, 95% CI 0.60–1.63) and self-management behaviors (SMD 1.55, 95% CI 0.86–2.25). They also reduced physiological symptom distress (SMD –0.58) and enhanced quality of life (SMD –0.39). However, no significant effects were observed on peak VO₂ or negative emotional states, indicating variability across certain outcome domains.

Conclusions

The findings indicate that **self-efficacy-based self-management programs** enhance patients' confidence, **support sustained self-care behaviors, reduce symptom burden, and improve quality of life.** Effective interventions are **typically theory-driven, delivered individually or in groups through face-to-face or online formats, and implemented over 6–12 weeks with follow-up** within **4–12 weeks.** Limitations include varied program content, difficulty with blinding, and small sample sizes. Future large-scale RCTs are needed to strengthen the evidence. Clinically, integrating self-efficacy as a central component and tailoring programs to patient needs may improve engagement and outcomes in heart failure care.

Relevance to health promoting hospitals and health services

This study supports HPH goals by demonstrating that self-efficacy-based self-management can empower heart failure patients, improve quality of life, and promote more sustainable and patient-centered chronic care.

Figure 1. Percentage of risk of deviation in self-efficacy assessment

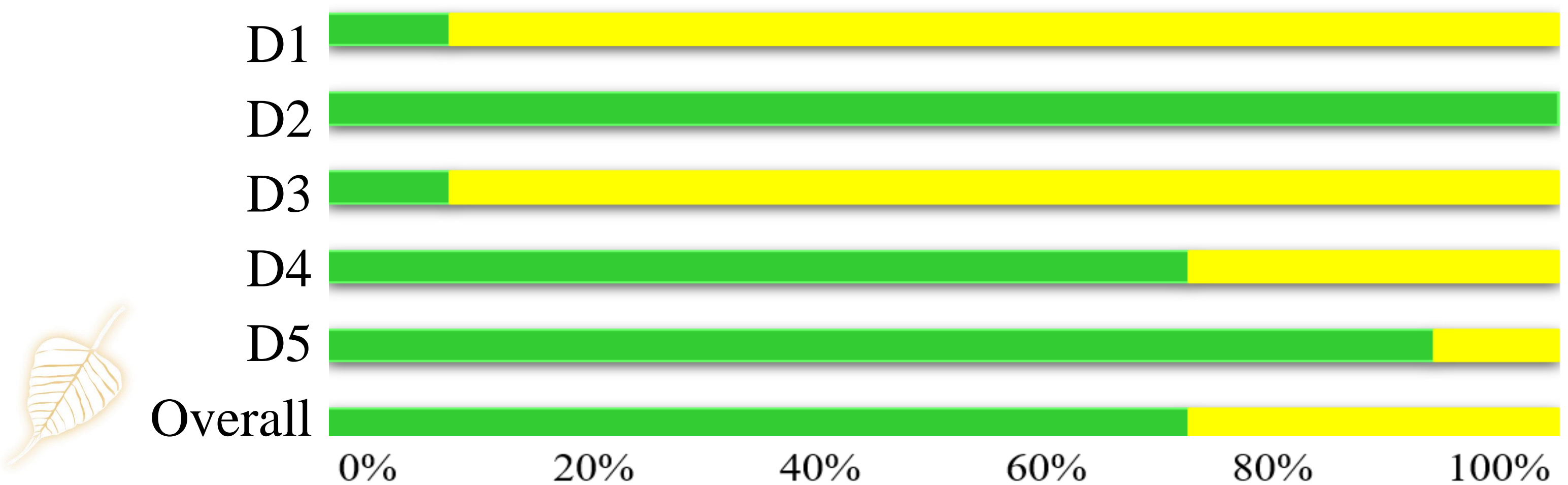


Table 2. GRADE Evidence Quality Assessment of Self-Efficacy Outcomes

Outcome indicator	Risk of bias	Inconsistency	Indirectness	Imprecision	Publication bias	Overall effect size [95% CI]	Number of participants	Quality of evidence
Self-efficacy	Not serious	Not serious	Not serious	Serious ^a ; OIS = 7013	Not serious	SMD = 1.11 95% CI [0.60, 1.63]	1186 participants	⊕⊕⊕⊖ Moderate

GRADE Strength of Recommendation

QoE	Balance between desirable and undesirable effects	Values and preferences	Cost-effectiveness / Resource use	Strength of recommendation
⊕⊕⊕⊖ Moderate	Significant benefits; no clear adverse effects; favorable	Consistent with clinical nursing needs	Long-term cost-effectiveness; resources are easy to obtain	Strong recommendation

Note. CI = confidence interval; SMD = standardized mean difference; RCT = randomized controlled trial; OIS = optimal information size; QoE = quality of the evidence. ^a In the imprecision assessment, although the pooled effect estimate in the forest plot did not cross the line of no effect and the 95% CI favored the intervention, the total sample size was clearly lower than the OIS; therefore, the evidence was downgraded by one level. This study used the JavaScript sample size estimation software (<https://www.stat.ubc.ca/~rollin/stats/ssize/>) to calculate the OIS for each forest plot.