# Assessing the Impact of a Digital Health Intervention on Self-Efficacy in Heart Failure Patients

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## Objective

We aimed to assess changes in self-efficacy among a population of older adults with heart failure taking part in a 6-month digital health study which involved daily use of an activity tracker and smart scale.

This intervention was intended to promote adherence to consistent self-care (i.e., physical activity and weight monitoring), which is critical in heart failure patients.

Self-efficacy has been shown to have an extremely powerful impact on self-care behaviors and health outcomes in prior work.[1-3]

## Methods

The full protocol for this study can be found by scanning the QR code. For this interim analysis, we used linear mixed-effects modeling to assess changes in self-efficacy over four time points (baseline, 6 weeks, 12 weeks, 24 weeks). Self-efficacy was assessed by the SCHFI (Sectior C), a 6-item instrument that has been proven to be reliable and valid.[4]

Models sequentially incorporated time-varying and time-invariant predictors, representing a variety of sociodemographic, psychosocial, and health-related factors (see Table 1), with two non-significant predictors (financial hardship and use of trackers prior to the intervention) removed. A time-by-group interaction was tested, and model fit was evaluated using ANOVA (AIC, BIC, deviance), with assumptions met.

**Table 1: Predictors of change in self-efficacy over 24 weeks**

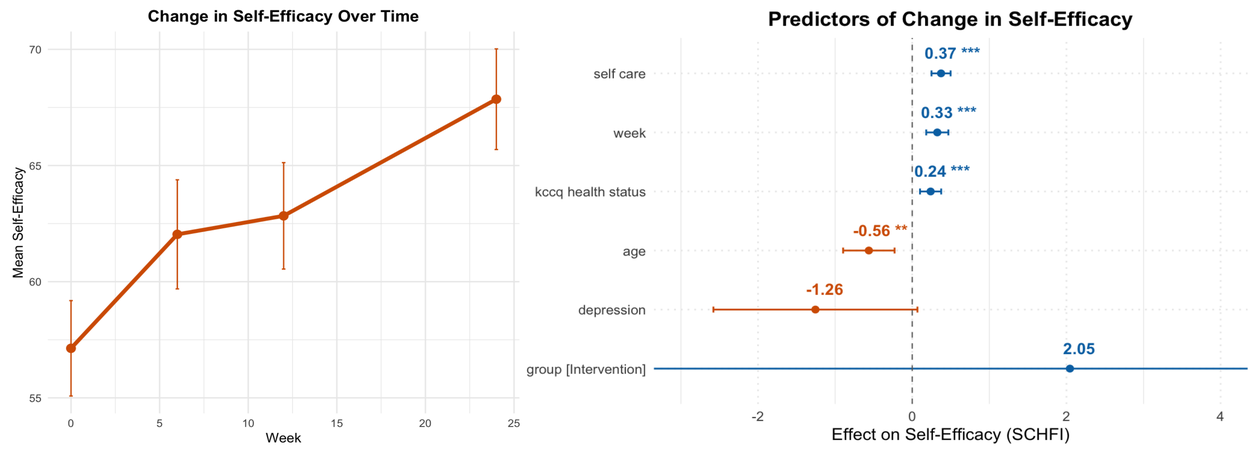
| Predictor | Estimate (B) | SE | p-value |
|---|---|---|---|
| Week | 0.33 | 0.07 | <0.001*** |
| Self-Care (EHFBS-9) | 0.37 | 0.06 | <0.001*** |
| Health Status (KCCQ) | 0.24 | 0.07 | 0.001** |
| Age | -0.56 | 0.17 | 0.001** |
| Depression (PHQ-2) | -1.26 | 0.68 | 0.064 |
| Group (Intervention vs. Control) | 2.05 | 3.12 | 0.514 |

*Model: Linear mixed-effects with random intercept (ICC = 0.54); N = 98.*
*Significance codes: *** p < .001; ** p < .01; * p < .05.*

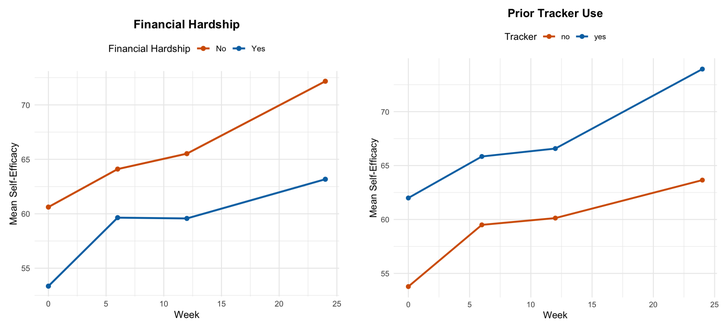
## Results

Our sample included 98 study participants (mean age = 60.7 ± 9.1 years, 66% male, 79% White, non-Hispanic).

The model with the best fit (AIC = 3208.4, BIC = 3244.0, deviance = 3190.4) revealed a significant increase in self-efficacy over time (B = 0.33, p < 0.001). Predictors of self-efficacy are visualized in the figure below and in Table 1.




While not associated with statistically significant changes in self-efficacy over the study period (and thus not included in the model), participants with financial hardship and lower digital literacy (i.e., no prior experience with health technology) had lower self-efficacy scores at all time points.




## Key Takeaways

- Self-efficacy significantly increased over 24 weeks (p < .001), demonstrating the positive impact of digital health technologies.
- Better health status and self-care adherence predicted greater self-efficacy.
- Older age was significantly associated with lower self-efficacy.
- Depressive symptoms showed a negative but non-significant association with self-efficacy.

## References & Acknowledgments

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