Motivational Messaging in a 1-week Trial of a Digital Health Program for Older Family Care Partners of Persons with Heart Failure

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Background

- Older family caregiver partners (FCPs) of persons with heart failure (HF) experience high physical, emotional, and financial burden.
- Caregiver burden contributes to FCPs' health risks and increased rehospitalization and mortality in HF patients.
- To support older HF-FCPs' health, we developed TPA4You, a digital physical activity (PA) program.
- Guided by the Social Cognitive Theory and the Unified Theory of Acceptance and Use of Technology, TPA4You integrates:

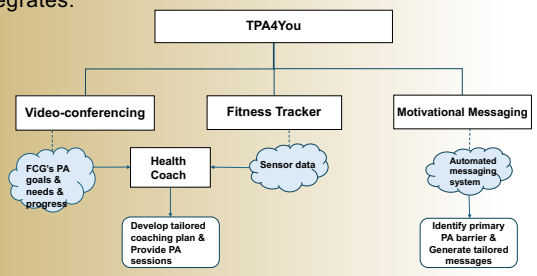

Fig 1. *TPA4You* Technology Description

Objectives

- Examine older HF-FCPs' perceptions of using motivational messaging in TPA4You through a 1-week, two-phase field test

Methods

- Qualitative descriptive study
- Recruited from the Advanced HF Clinic, University of Colorado Hospital between February and June 2023

Inclusion	Exclusion
• Age ≥ 60 years • Involved in caring for a household member (≥ 60 years) with the NYHA II, III, or IV HF • Provide ≥10 hours/week of unpaid care for the past 3 months • Able to physically engage in structured exercise (e. g., walking, upper body resistance exercises) • Engaged in moderate-intensity exercise (< 30 minutes) 3 days/week • Reads, speaks and comprehends 5th grade English • Owns a smartphone • Can be reached by email, text messaging or telephone • Area in home at least 6x6 feet for PA in the place of residence	• Medical or functional conditions precluding participation in the PA components of the intervention • Cognitive impairment (TICS score < 25) • Inability to use technology • Underwent PA intervention recently (≤ 6 months) • Current participation in another PA or behavior change trial • Physical activity unpreparedness using PAR-Q

- Two phases, 1-week, one-on-one TPA4You field test

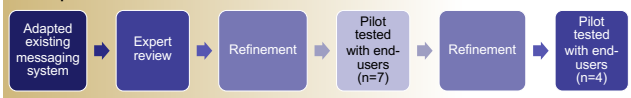

Fig. 2 Study Flow Diagram

- Messaging system used in Phase 1

- For 2 messages per week, Phase 1 participants logged into the system and completed PA barrier surveys twice weekly.
- Exit interviews thematically analyzed after each phase.

Results

- Participant Characteristics (N=11)
  - Mean age: 68.2 ± 7.1 years
  - 91% female; 82% spouses; 91% non-Hispanic White

Phase 1 (n=7) Feedback

- PA barrier survey questions were repetitive and tedious.
- Messages were helpful when they offered relevant advice.
- Content lacked value or motivation for behavior change.
- Message examples: *"Want to fight fatigue? Exercise is one of the best ways to increase your energy and stamina throughout the day. Ready to start moving?" "Exercise is a process. Start small, and build up gradually to more."*
- Difficulties receiving messages after completing surveys within the system
- Most perceived messages as formulaic or computer-generated

Refinement Process

- **Messages refined by feedback: more personalized, encouraging, supportive, and action-oriented.**
- Examples: *"Hi _____ ! This is _____. Based on your survey results, it sounds like self-efficacy was your biggest challenge to being active this week. Using your Fitbit and the goals we make, try setting a target number of steps at the start of each week, then see if you can achieve that goal. Pick something that you can achieve, but is more than a normal day (i.e., try to hit the number of steps you took on a really busy day). Next week, increase that goal by a little bit. Keep up the great work!"*
- PA barrier survey refined by reducing questions (from 25 to 4) with clear words
- Examples: *"What was the biggest challenge you faced this week to your physical activity?" , "Tell us more about why and/or how the challenge you selected interfered with your physical activity this week."*
- PA barrier survey and messages sent by health coach via email

Phase 2 (n=4) Feedback

- More encouraging and helpful for maintaining motivation
- Practical advice and valued the self-reflection prompted by surveys
- Receiving messages twice weekly was appropriate
- Need to further tailor timing to user preferences

Conclusion

- Older HF-FCPs valued authenticity, relevance, and emotional tone.
- Human-delivered, personalized messages were more engaging and motivating than automated ones.
- AI-powered personalization could enhance scalability while preserving the "human touch."
- Small sample size limits generalizability; larger, more diverse trials are warranted.
- Next plan is to conduct a randomized controlled trial to evaluate TPA4You's effects on PA outcomes and well-being in older HF-FCPs.