The Influence of Cognitive Ability on Heart Failure Self-care using Digital Health

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The Influence of Cognitive Ability on Heart Failure Self-care using Digital Health Interventions: A Case Study

Background: Heart failure (HF) can be managed through self-care. However, cognitive dysfunction is a large barrier to achieve self-care goals by HF patients. The emergence of behavior-sensing digital health interventions may facilitate self-care behaviors despite cognitive dysfunction among HF patients.
Objective: The objective of this case study analysis is to examine whether cognitive ability and its' domains impact engagement in weight-monitoring and physical activity self-care behaviors that are facilitated by digital health interventions.
Methods: English-speaking HF adults aged >55 years recruited from Texas cardiac settings participated in digital health interventions that involved activity tracker, smart weight scale sensors and apps that tracked and provided behavior feedback for 12 weeks (84 days). Cognitive ability and behavior engagement were assessed by Montreal Cognitive Assessment (MoCA) and sensor logs. Participants in 3 groups of MoCA scores were assessed for patterns in self-care behaviors.
Results: Cognitive domains of executive skills with verbal abstraction, visuospatial skills, episodic memory, and language were highest in the group with a MoCA score > 26. For the 26+ MoCA score range group (n = 1, Age: 55 to 64 years, Male, Bachelor's education, HF duration of 1 year), the average weight-monitoring days was 10 while the average total steps were 5096.5. For participants in the 21-25 MoCA score range group (n = 5; 80% were 55 to 64 years, 60% females, 60% Bachelor and 20% diploma education, 60% < 1 year of HF Diagnosis) the average weight-monitoring days in total was 64.4 (baseline average 53 days) while the average total steps were 3448.875. For the <21 MoCA score range group (n = 7, 70% > 65 years, 70% female, 40% high school education, 60% < 1 year of HF Diagnosis), the average weight-monitoring days in total was 62 (baseline average 55 days) while the average total steps were 2812.33.
Conclusions: The findings from this small case study analysis suggest that the feasibility of using digital health interventions for HF patients with cognitive dysfunction in addressing disparities with engagement in self-care behaviors.