

Accelerating Physical Therapy Exercise Monitoring through Digital Health Technology for People with Parkinson's

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Purpose/Hypothesis: Use of digital health technology (DHT) and behavior change interventions may be able to help people with Parkinson's (PwP) improve their exercise habits to reach recommended exercise guidelines. Aims were to explore if physical therapists (PT) can promote DHT use in PwP who were referred to an early intervention, low-dose consultative model of physical therapy. We hypothesized that increased DHT use would be associated with improved self-report of exercise and physical function measures.

Subjects: 33 PwP enrolled over a 15-month period, with 26 (79%) completing the 6-month study. Participants were 64% male with a mean age of 65 ± 8 years with a baseline exercise vital sign of 230 ± 139 minutes per week of exercise. Physical therapists ($n=8$) had average of 6.9 years experience, with 4.8 years at the organization, including treating the early PD population.

Materials and Methods: We used a mixed methods approach with measurement at baseline and 6 months. PTs were educated on DHT in an initial 60-minute training, monthly meetings for the first 9-12 months, followed by audit and feedback of documentation. Patients completed surveys of Falls Efficacy Scale, Self-Efficacy for Exercise Scale, MDS-UPDRS Part I and II, Fatigue Severity Scale, Starkstein Apathy Scale, PDQ-39, Hospital Anxiety and Depression Scale, and Health Information Technology Usability Evaluation Scale. Functional outcome measures were performed at baseline and 6 months, including 10-meter walk test (10mwt), 6-minute walk test (6mwt), and Mini-BESTest. Pre and post-test results were compared using a two-tailed t-test. PwP received an initial consultative PT assessment, follow-up DHT support as needed by a research facilitator (e.g. phone calls, emails), and a follow-up research evaluation at 6 months. PwP and PTs completed exit interviews about their experiences. PwP were allowed to receive skilled rehabilitation during this period as determined by PT discretion.

Results: Recorded frequency and intensity of aerobic and strengthening exercises increased in PT documentation ($p < 0.05$). The number of PwP reporting using DHT ≥ 5 days/week increased from 11 to 18, but there was no significant change mean minutes of exercise per week (post: 228 ± 96 , $p = 0.97$). Function remained stable: 6MWT (pre: 586 ± 92 meters; post: 609.7 ± 76 meters; $p = 0.06$), Mini-BESTest

(pre: 23.8+- 2.9; post: 24.8+-2.5; p=0.029). No other functional or self-reported measures changed significantly over 6 months. PwP exit interviews suggest higher adoption of DHT for those who were initially more comfortable or eager to learn technology. PT exit interviews suggest that they value using DHT and scaled DHT recommendations to other patient populations.

Conclusions: These findings suggest that PT education and engagement can positively impact patient-reported use of DHT and facilitate increased exercise behaviors in PwP. With this intervention delivery, patients remained functionally stable through 6 months.

Clinical Relevance: Incorporating DHT into physical therapy practice may be valuable to improve exercise adherence for PwP.

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