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Contribution ID: **232** Type: **1 - Scientific Poster**

Individualized App-based Exercise Therapy for Cancer Patients: Assessing Patient Adherence and Comprehensive Physical Assessments

Thursday 23 July 2026 14:25 (20 minutes)

Background: Physical activity is essential for improving outcomes and managing side effects in cancer patients. App-based exercise interventions may enhance access to exercise therapy. To provide precise recommendations, accurate assessment of physical function and limitations is crucial. This feasibility study investigated a digitally assisted exercise program and the role of comprehensive assessments in enabling personalized, remote exercise prescriptions.
Methods: In a single-arm design, 14 patients with lung or colorectal cancer at various disease stages underwent 12 weeks of automated, digitally assisted exercise therapy. At baseline (T0), patients completed a comprehensive set of physical assessments, including cardiopulmonary exercise testing, six-minute walk test, handgrip strength, five-times sit-to-stand, and Brief-BESTest, alongside questionnaires. Individualized endurance and resistance training plans were delivered via a smartphone app and monitored with a smartwatch. A decision-support system adapted plans weekly based on patient feedback, needs, and limitations. At follow-up (T1), all assessments and questionnaires were repeated.
Results: Six patients discontinued early due to repeat tumor surgery or hospitalization and one for personal reasons. Across the remaining cohort, adherence to training recommendations declined from ~80% in the first three weeks to ~60% in the last weeks and varied greatly between individuals. No significant changes were observed in walking distance, strength, balance, or self-reported outcomes. Compared to healthy controls, patients exhibited markedly reduced balance, slower sit-to-stand performance, and lower scores for quality of life, self-efficacy, and physical activity.
Discussion: App-based exercise therapy was feasible for cancer patients, but the high dropout rate underscores challenges in sustaining participation during active treatment. Despite most patients being in active treatment, physical function and activity remained stable during intervention, yet significantly lower than those of healthy controls. Declining adherence suggests motivational barriers or technical limitations over time. Future studies should include control group, longer follow-ups, and strategies to enhance engagement.

Keywords

app-based exercise therapy,
digital health,
physical activity,
wearables

Conflict of Interest & Ethical Approval

yes

Abstract submitters declaration

yes

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Session Classification: Poster Session