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A Randomized Controlled Trial of a Personalized Telehealth Exercise, Nutrition, and Stress-Management Program for Cancer Survivors

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Purpose: Structured exercise, nutrition, and stress-management programs improve survival and quality of life (QoL) in cancer survivors, but adoption is limited by low adherence, cost, and access barriers. We evaluated a synchronous telehealth intervention delivering computationally personalized regimens in exercise, nutrition, and stress relief, guided by oncology-trained health coaches, as a novel treatment for patients.

Methods: We conducted a decentralized, randomized controlled trial across 33 U.S. states (NCT06397651). Adults aged ≥21 years within 12-months of active cancer treatment were randomized 1:1 to a personalized telehealth intervention(n=84) or education-only control(n=74). The intervention used an algorithmic engine to select individualized regimens from >3,600 combinations based on each participant's case characteristics, functional status, and preferences. Participants attended 45-minute live video sessions—30 minutes structured physical activity, 8 minutes nutrition counseling, and 7 minutes guided meditation—up to five times weekly. Controls accessed self-guided online educational materials. The primary endpoint was change in QoL by FACT-G at 12-months. Secondary endpoints included adherence and work productivity. Analyses followed intention-to-treat principles using difference-in-differences estimation.

Results: Among 158 participants (median age 54 years; 82% female; 63% breast cancer), baseline characteristics were similar across arms. Engagement in the intervention arm remained high: 89% active at 3-months, 75% at 6-months, and 58% at 12-months, averaging 3 sessions/week. QoL improved by +10.8 FACT-G points(p=0.0042), exceeding the 7-point clinical significance threshold, with gains across physical, emotional, social, and functional domains. Participants reported significant improvements in work motivation(p=0.0332) and performance(p=0.013). Session frequency demonstrated a dose-response relationship with QoL improvement(r=0.50). No participation-related adverse events occurred.

Conclusion: A computationally personalized, synchronous telehealth lifestyle intervention produced durable improvements in QoL, adherence, and functional outcomes in a geographically diverse cancer survivor population. Combining algorithm-driven precision with live coaching offers a scalable, human-centered, non-pharmacologic treatment that extends the survival-linked benefits of structured lifestyle therapy into routine oncology care.

Keywords

Synchronous Telehealth, Quality of Life (QoL), Cancer Survivorship, Digital Integration, Computational Personalization

Conflict of Interest & Ethical Approval

yes

Abstract submitters declaration

yes

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