Using Exercise to Improve Arthralgia and Aromatase Inhibitor Adherence in Older Breast Cancer Survivors: Preliminary Results from a Pilot Randomized Controlled Trial

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INTRODUCTION

- Breast cancer is the most invasive cancer in women, 80% are ER+; ~ 80% of breast cancer survivors (BCS) are ≥ 60 years
- Aromatase inhibitors (AIs) reduce recurrence but often cause arthralgia, impairing physical function & adherence, often causing early discontinuation (< 5 years)
- Physical activity (PA) and symptom management education help manage arthralgia but remain underutilized
- Older BCS face higher risk of early AI discontinuation, making adherence a critical issue in survivorship care
- This pilot targets AI adherence among BCS using scalable, non-pharmacological strategies bridging clinical & public health
- **Objective:** Adapt an evidence-based exercise program and test a self-management approach (figure 3) combining education- and exercise-based strategies (treatment) versus education only (control) for improving AI-associated arthralgia in older BCS

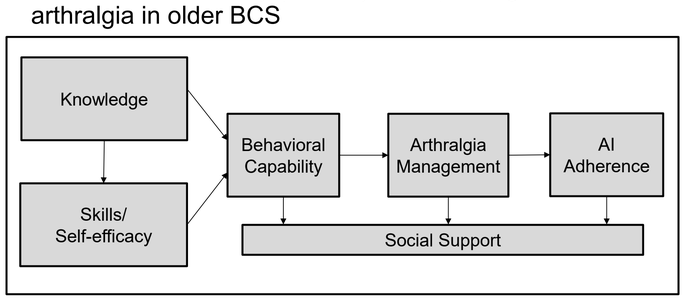


Figure 3. Conceptual Model: Self-Management Intervention (derived from Social Cognitive Theory)

METHODS

- Randomized controlled pilot trial
  - N = 24 (11 standard care, 13 treatment)
- Baseline visit: received ACS educational materials about hormonal therapy
- 1:1 randomization: Exercise + educations vs. standard care
- Intervention:
  - 8 weeks of bi-weekly remote sessions: 60-min low-impact aerobic + light weights (*Fit & Strong!* adapted), 30 mins of breast cancer survivorship education
  - Followed by 8-weeks of at-home exercise + phone counseling

ELIGIBILITY CRITERIA

1. Female BCS, ≥ 60 years, diagnosed stage I-III ER+ non-metastatic breast cancer
2. Completed surgery, radiation, and/or chemotherapy Insufficient PA (<150 mins/week of moderate-vigorous PA, <2 strength sessions/week)
3. Planning to start AIs; initiated within past 6 months

MEASURES

Physical Activity	CHAMPS Questionnaire, Exercise Logs, ActiGraph Accelerometer (GT3X+)
AI-Associated Arthralgia	**Brief Pain Inventory (BPI)**, Western Ontario and McMasters University Osteoarthritis Index (WOMAC), Quick DASH
Behavioral Predictors	Exercise Self-Efficacy Scale, Social Support for Exercise Scale, Knowledge about Breast Cancer Treatment and Survivorship, **Morisky-Levine Medication Adherence**
Cancer-Specific Geriatric Assessment	Timed "Up and Go", Orientation Memory Concentration Test, OARS Functional Assessment, Medical Outcomes Survey, General Health (OARS), Depression, Medication Inventory, Falls, Current Self-Rated Health, Blood Draws for Inflammatory Biomarkers
Physical Measurements	Height, Weight, BMI, Grip Strength

A remotely delivered education- and exercise-based program leads to greater reductions in joint pain interference and greater improvements in medication adherence.

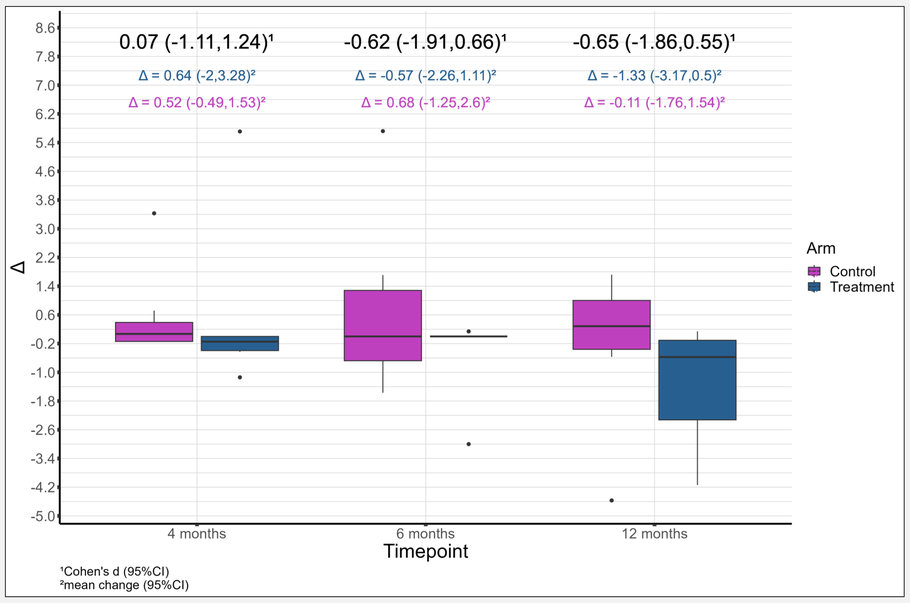


Figure 1. BPI: Pain Interference Change from Baseline with Effect Sizes

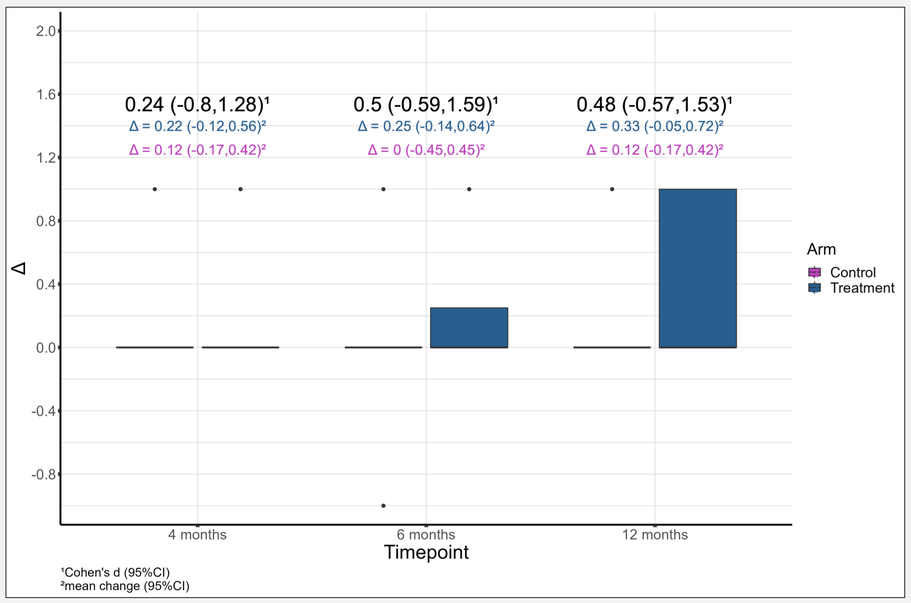
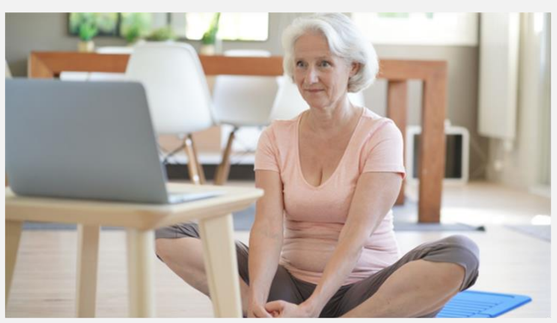


Figure 2. AI Medication Adherence Change from Baseline with Effect Sizes



Acknowledgements:

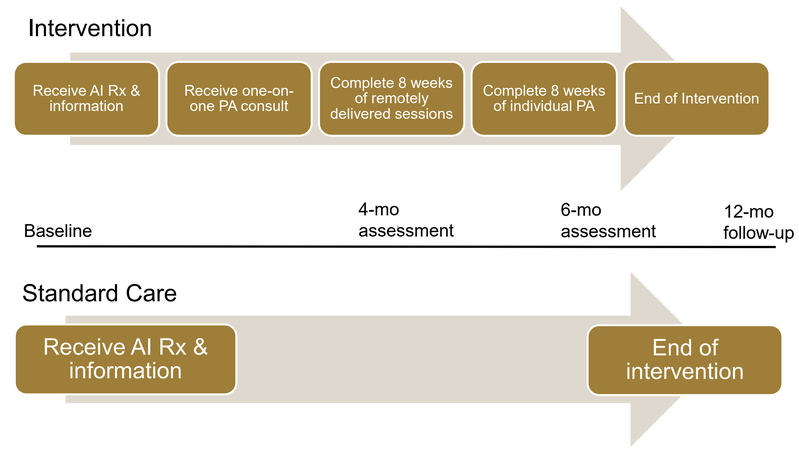
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STATISTICAL ANALYSES

Primary endpoint = changes in joint pain
Secondary endpoints = AI Adherence

- Use means and Standard Deviations (SDs) to generate effect sizes for joint pain, knowledge, & self-efficacy
- ANOVA using blocks with 4 stratum levels to assess statistically significant differences between groups
- MPR ratio based on self-reported adherence & examine predictors of AI adherence using linear regression
- Assess covariates: age, race/ethnicity, co-morbidities, BMI, education, marital status, treatment modalities, tumor stage, self-rated health as potential confounders



RESULTS

	Patient Data
Gender, n (%)	Female: 24 (100%)
Race, n (%)	Non-Hispance White, 22 (92%)
Rural Status, n(%)	From rural area: 8 (33%)
Age (mean, SD)	71.4 (6.6)
Comorbidities, n (%)	18, (75% 2 or more)

- 80% retention over 12 months
- PA increased from baseline to 4 months; treatment maintained PA better than standard care across 4 assessments
- Greater ↓ in pain interference in treatment arm, with largest improvement at 12 months (Δ = -1.33 vs -0.11)
- Moderate ↓ in joint pain interference (d = -0.465, p = 0.43)
- Greater ↑ in medication adherence in treatment arm, with largest gain at 12 months (Δ = 0.33 vs 0.12)
- Practically significant ↑ in AI-adherence (d = 0.632, p = 0.22)

DISCUSSION

A tailored, self-management approach was feasible, safe, and highly acceptable among older BCS on AIs. The intervention improved PA maintenance and reduced pain interference, with meaningful gains in AI adherence. These findings highlight the potential of scalable, non-pharmacological strategies to address adherence challenges in survivorship care.