

Changes in Physical Activity, Body Composition and Strength across a Two-Phased Online Community-Based Exercise (CBE) Intervention Study among Adults Living with HIV: Results from the Tele-Coaching CBE Study

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Background

- Community-based exercise (CBE) can help manage health-related challenges associated with HIV and concurrent conditions.
- Environmental, personal, and social barriers exist to exercising in gym environments.
- Online CBE may be one rehabilitation strategy to help manage disability experienced by adults living with HIV.

Purpose

To examine changes in physical activity, body composition, strength, and flexibility among adults with HIV engaged in an online community-based exercise (CBE) intervention.

Methods

- Longitudinal intervention study: 6 month online CBE intervention, followed by a 6 month follow-up phase.
- Inclusion Criteria:** Adults living with HIV in Toronto who: consider themselves medically safe to exercise as determined by the self-administered Physical Activity Readiness Questionnaire; have access to the space and technology to engage in online CBE; and are willing to exercise for 1 year.
- Recruitment:** We recruited via community-based organizations, an HIV clinic via the OCS, and with participants who agreed to be contacted from a prior CBE study with the YMCA.
- Protocol for the study can be accessed here (BMJ Open, 2023)



Online CBE Intervention Phase (Months 0-6)

Online 1-to-1 exercise sessions with a personal trainer (Bi-weekly)

Exercise: Combination of aerobic, resistance, balance and flexibility exercise (3x/week)

Online group educational sessions: self-management and health (Monthly)

Participants were provided with the following:

- Online Coaching Sessions
- Aerobic Exercise
- Resistance Exercise
- Balance and Flexibility Exercise
- Online Group Educational Sessions
- Exercise App
- Wireless Physical Activity Monitor
- Home Exercise Equipment

Follow-Up Independent Exercise Phase (Months 6-12)

- Participants were encouraged to engage in independent exercise 3x/week including online group exercise classes.
- Participants continued to have access to the exercise app, wireless physical activity monitor, and home exercise equipment.

Data Collection & Analysis

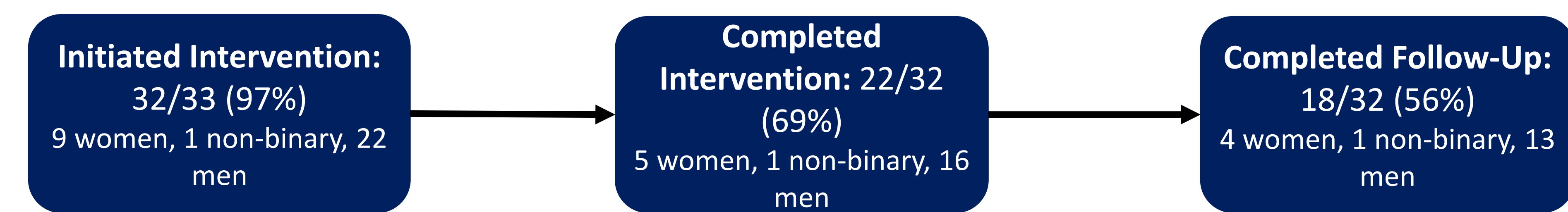
- Measured engagement in physical activity weekly; body composition, strength and flexibility outcomes measured bimonthly.
- Primary Outcome:** Self-reported number of days per week of exercise - **In the past week, on how many days did you do a total of 30 minutes or more of moderate or vigorous physical activity, which was enough to raise your breathing rate?**
- We assessed adherence to biweekly online coaching sessions.
- We used segmented regression to assess the change in trend (slope) between phases.

Results

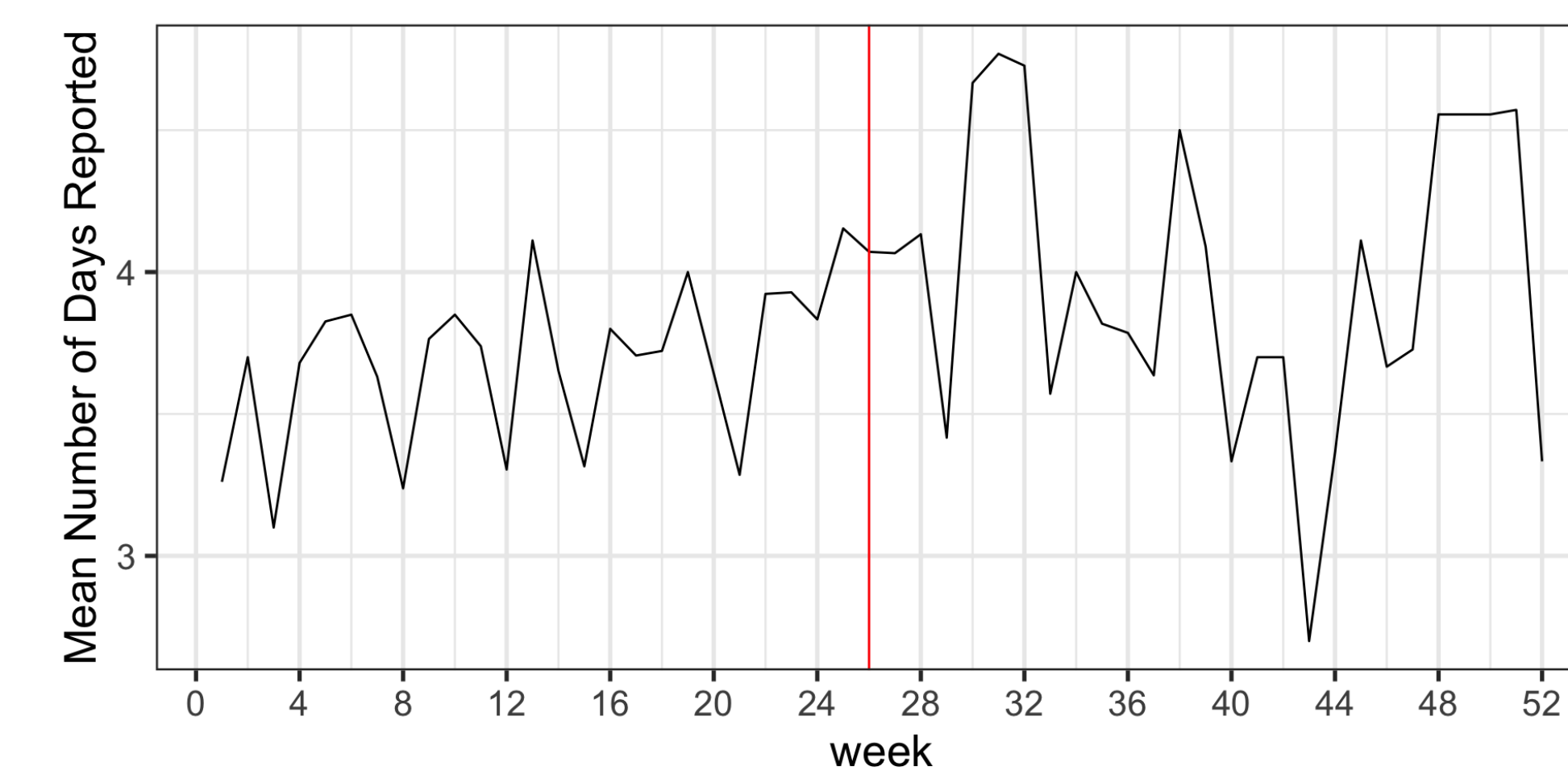
Characteristics of Participants at baseline

Participant Characteristic at Baseline	Participants who Initiated Intervention (n=32) n (%)
Median age in years (IQR)	53 (43, 60)
Gender	
Cis-Man	22 (69%)
Cis-Woman	9 (28%)
Non-binary	1 (3%)
Median year of diagnosis (IQR)	2002 (1991, 2012)
Currently taking antiretroviral medication	32 (100%)
Median # of comorbidities (IQR)	3 (1, 7)
Living with ≥ 2 comorbidities	23 (72%)
Common comorbidities (>30%) included:	
Cognitive decline	10 (31%)
Gastrointestinal conditions	15 (47%)
Mental health condition (e.g. depression, anxiety)	12 (38%)
Trouble sleeping (insomnia)	11 (34%)
Employment status – working full or part time	15 (47%)
Gross yearly income <\$30,000 CAD	14 (44%)
Currently living alone (n=28 participants)	12 (43%)
Cigarette smoking history – currently smoke regularly/occasionally	5 (16%)
Excellent, very good or good overall perceived health	25 (78%)

Retention in Study



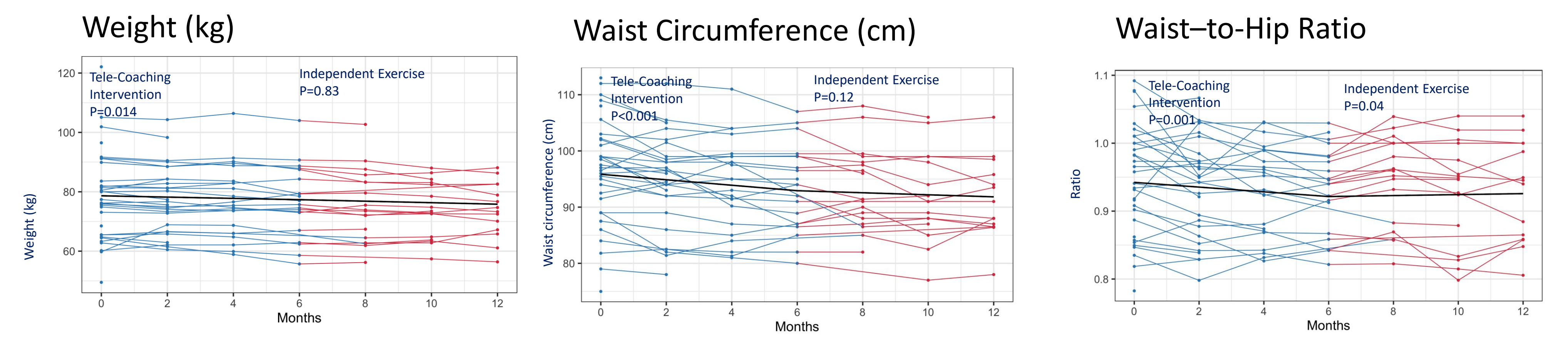
Engagement in Physical Activity



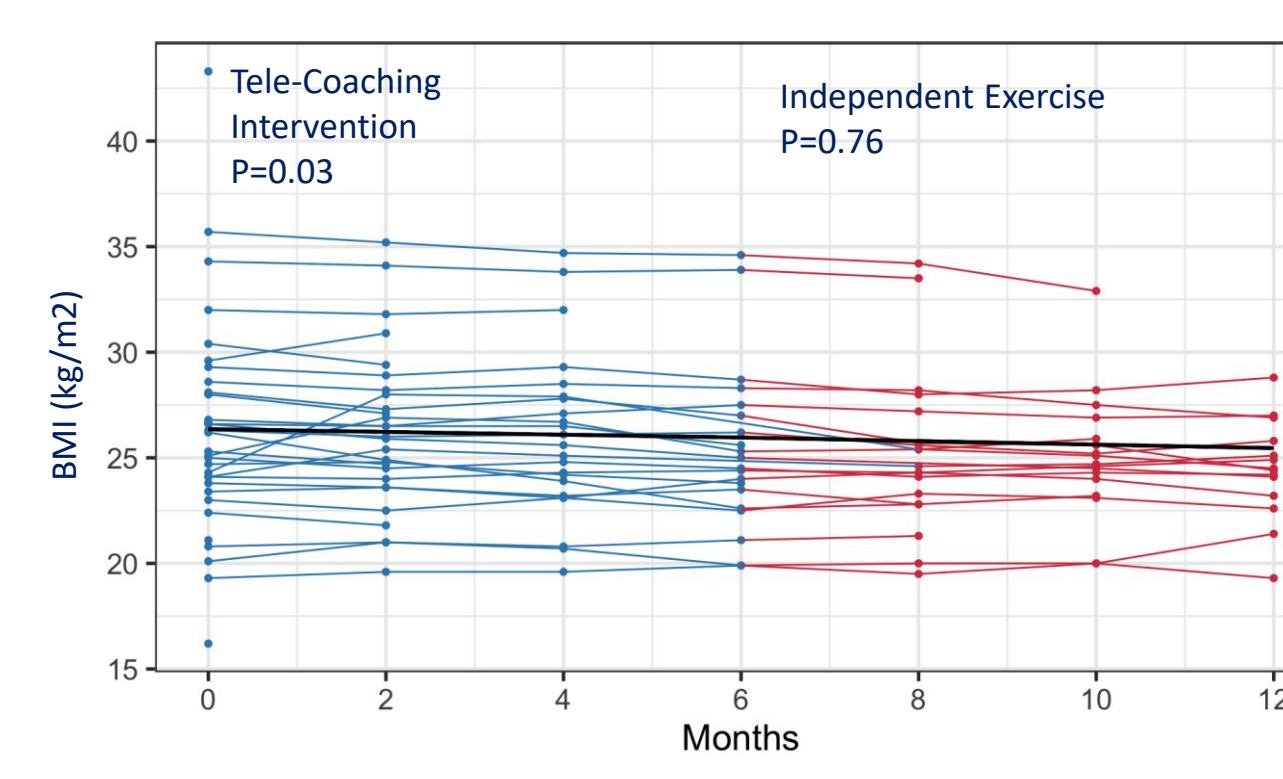
Number of Days of Exercise in the Past Week

Engagement in Physical Activity
Increased a median of **0.02 days/week (95% CI: 0.01, 0.04)**, from 3.24 days at baseline (95%CI: 2.69, 3.79) to 3.77 days (95%CI: 3.22, 4.33) at the end of intervention, and reduced to 3.71 days (95%CI: 3.10, 4.32) at the end of follow-up.

Body Composition



Body Mass Index (BMI) (kg/m²)



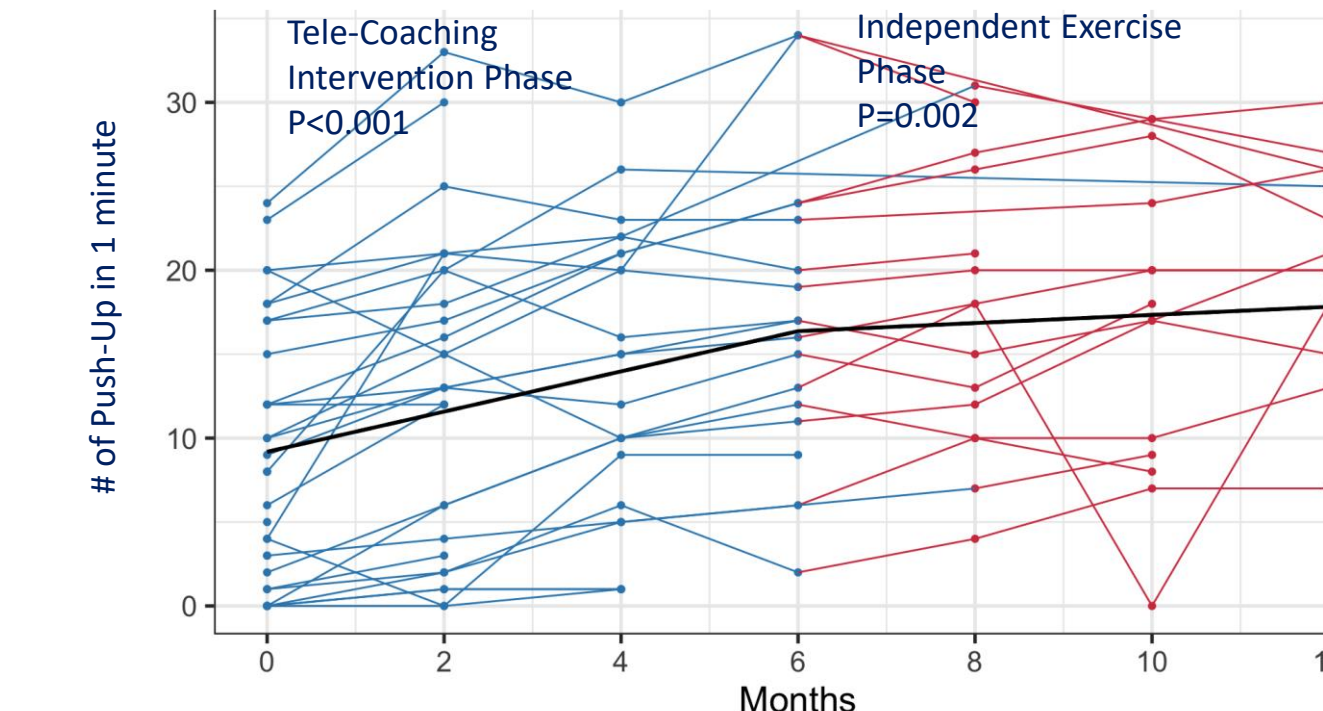
Rate of Change During Intervention:
Monthly rate of change (slope) significant for **weight (-0.2kg/month; 95%CI: -0.39, -0.04)**
BMI (0.1kg/m²/month; 95%CI: -0.13, -0.01)
waist circumference (-0.5cm/month; 95%CI: -0.69, -0.28)
waist-to-hip ratio (-0.003/month; 95%CI: -0.01, 0.00)
No changes in muscle mass, body fat %, or hip circumference during the intervention.

At End of Intervention Phase (6 months):
Mean decreases in:
weight (-1.2kg; 95%CI: -2.34, -0.24)
BMI (-0.6kg/m²; 95%CI: -0.78, -0.06)
waist circumference (-3cm; -4.14, -1.68)
waist-to-hip ratio (-0.018; 95%CI: -0.06, 0.00)

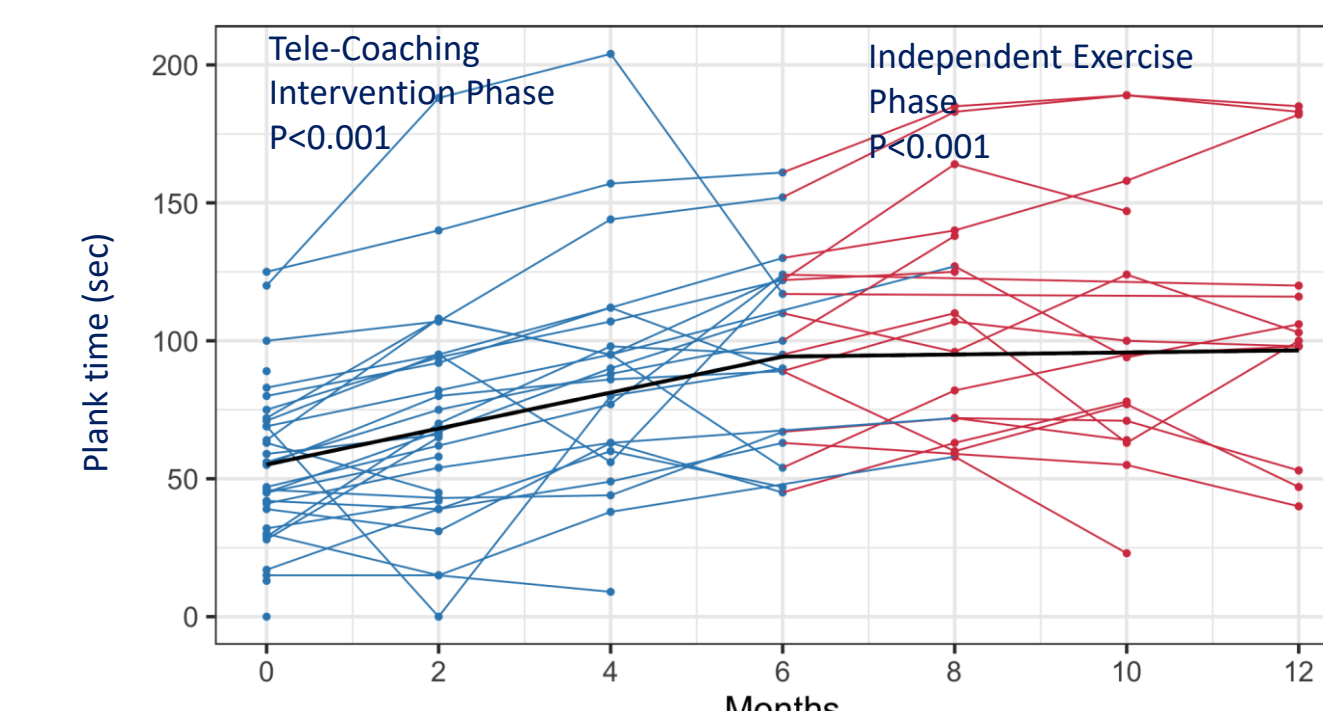
At End of Follow-Up Phase (12 months):
No significant rate of change in slope during follow-up phase. **Changes in body composition during the intervention sustained in the follow-up phase.**

Strength

Push-ups (number in 1 min)

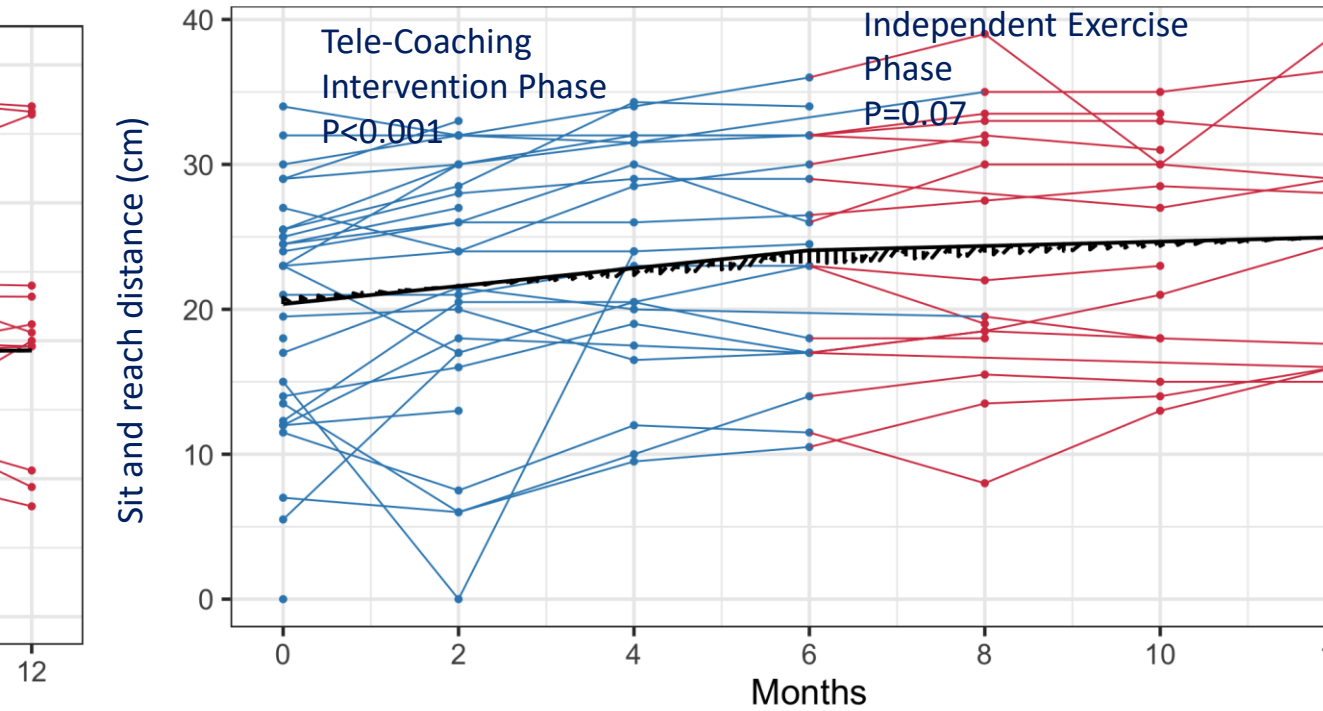


Plank time (seconds)

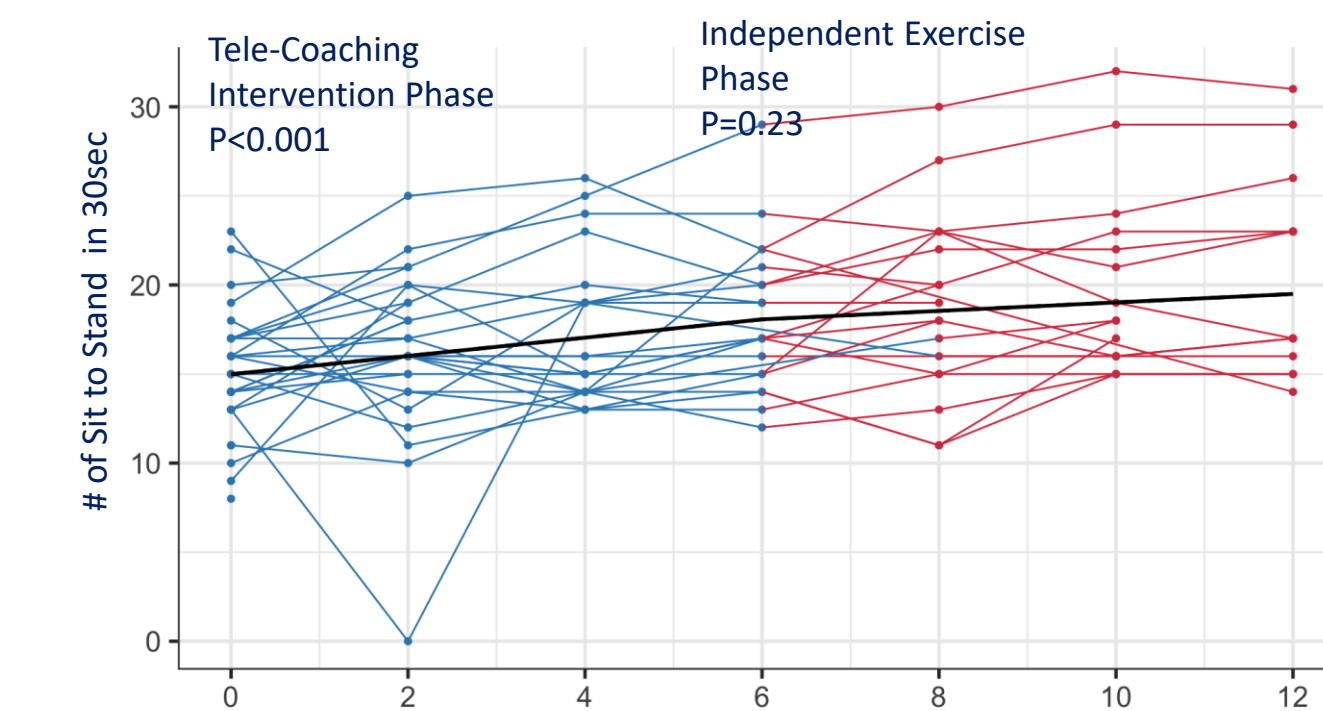


Flexibility

Sit and reach test (cm)



Sit to Stand (number in 30 sec)



Rate of Change During Intervention:
Monthly rate of change (slope) significant for:
push-ups (1.2 pushups/month; 95%CI: 0.88, 1.52)
plank time (6.5sec/month; 95%CI: 4.72, 8.33)
sit-to-stand (0.5 times/month; 95%CI: 0.28, 0.75)
sit-and-reach (0.6cm/month; 95%CI: 0.36, 0.88)

At End of Intervention Phase (6 months):
Significant mean decreases in:
push-ups (7.2 pushups; 95%CI: 5.28, 9.12)
plank time (39 sec; 95%CI: 28.32, 49.98)
sit-to-stand (3 times; 95%CI: 1.68, 4.5)
sit-and-reach (3.6cm; 95%CI: 2.16, 5.28)

At End of Follow-Up Phase (12 months):
Significant reduction in benefits compared with those observed during the intervention for push-ups, and plank time.

Discussion

- Engagement in Physical Activity**
 - Small steady gains were observed in physical activity during the intervention, that were subsequently lost in the follow-up phase.
 - Adherence to biweekly online coaching session schedule (77%) may have been positively influenced by the majority (58%) of participants who enrolled in the intervention self-reported as engaged in exercise at enrollment.
- Strength, body composition and flexibility:** Significant improvements for some outcomes over the six month intervention phase. Significant reduction in benefits during the follow-up phase compared with those observed during the intervention for push-ups, and plank time.
- Limitations:** Benefits attributed to participants who remained in the study. Clinical importance of outcomes less clear.
- Future research:**
 - Examine influence of environmental, personal, and social factors on engagement and retention with online CBE.
 - Identify and implement strategies to optimize adherence to and engagement in online CBE interventions for equity deserving groups.
 - Explore considerations for long term sustainability of online CBE interventions.
- Findings may inform larger scale implementation of online CBE interventions for people living with HIV and other episodic health conditions.

Conclusions

Participants who remained in the study demonstrated increases in physical activity and improvements in strength, body composition, and flexibility during online CBE. Future research should consider strategies to support retention and engagement in physical activity.

Conflict of Interest Disclosure: We have no conflicts of interest.



Scan for more information on this study!