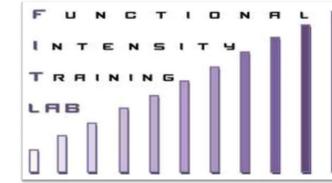


Individually Customized High Intensity Functional Training Improves Physical Function for Older Adults

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Background

- Older adults are at greater risk for falling, low fitness levels, and losing their ability to perform daily living activities (e.g., climbing stairs).^{1,2}
- Exercise programs that incorporate functional movements, mimicking daily living activities, may help promote health and preserve independence.
- High intensity functional training (HIFT) utilizes constantly varied multi-joint movements performed at relative high intensity in a group exercise format led by a trained coach.
- We previously found a 5-week HIFT program improved physical function of cancer survivors ages 47-60.³

Purpose

This pilot study investigated the feasibility and preliminary efficacy of a HIFT intervention for older adults.

Methods

Design

- Single group pilot study

Participants

- Screening: 13 older adults completed a medical history screening form and received physician clearance
- 4 were excluded for taking beta blockers
- Screened via the Berg Balance Scale⁴ administered by a licensed physical therapist (cut-off score of 41/56). She suggested exercise modifications if needed.
- 8 of 9 eligible participants enrolled
- Ages 65-84; mean = 71 ± 6 years
- 75% Female
- 100% White
- 50% College graduates



Participants enjoyed the Functional Fitness program!



Methods

Measures

- Feasibility was assessed by initiation, adherence, and intervention acceptability.
- Efficacy was determined by changes in perceived and objective functional movements.
- Outpatient Physical Therapy Improvement in Movement Assessment Log (OPTIMAL) - perceptions of the difficulty for and confidence in performing 22 daily tasks (e.g., rolling over, squatting, climbing stairs, walking) - ratings from 1-"able to do without any difficulty/fully confident to perform" to 5-"unable to do/not confident in my ability to perform"
- Objective functional movement assessments are below:

Objective Test	Domain Measured
Timed Up & Go	Mobility, strength, balance and agility
Lift and Carry	Coordination, upper body strength and agility
Chair Stand	Lower body strength and power
Stair Climb	Power and balance
6-Minute Walk Test	Cardiovascular endurance



Intervention

- 8 week, 2 days/week HIFT intervention
- Certified trainers delivered the individually customizable 60-minute group exercise protocol.
- Sessions were developed based on a CrossFit template⁵ and included a combination of weight-lifting, gymnastics (bodyweight), and monostructural (aerobic) exercises.
- Relative intensity based on each participant's current ability and fitness
- Workouts and exercises were individually scaled by weight used, number of repetitions or rounds, and movement modifications in decreasing difficulty as follows:

Overhead Squat	Deadlift	Handstand Push Up	Box Jump
<ul style="list-style-type: none"> • Front Squat • Back Squat • Lunge • Air Squat • Sit to Stand • Assisted Sit to Stand 	<ul style="list-style-type: none"> • Sumo Deadlift • Air Deadlift • Hip Hinge • Bow to Stand 	<ul style="list-style-type: none"> • Pike Push Up • Push Up • Snake Push Up • Plank • Wall Push Up • Wall Plank 	<ul style="list-style-type: none"> • Tuck Jump • Step Up • Hop

Typical Session: 5 min check-in and put on heartrate monitors for monitoring * 15 min warm-up * 15 min instruction and technique work * 5 min water/bathroom break * 11 min workout of the day (as many rounds as possible of 10 air squats, 10 kettlebell swings, 20m shuttle walk/run) * 9 min cool down

Results

Feasibility

- 89% initiation rate (8/9); 88% adherence rate (7/8; dropout for perceived health concerns, motivation/enjoyment, competitive group setting)
- High intervention acceptability with participants liking the coaching/supervision, scaled exercises, small group and peers in age and abilities
- Participant disliked the class time of day (9:30am) and wanted longer sessions.
- Participants were motivated to adhere because of personal goals, coach and researcher relationships, and the exercise program itself.
- Participants attained goals of improving fitness/physical function and acquiring new skills.
- Participants reported seeing improvements in daily activities outside of the gym.

Efficacy

- Functional Movements

- **Perceived:** participants' OPTIMAL perceived difficulty and confidence scores did not significantly change ($p > 0.05$), although confidence for individual items squatting ($t = 2.52$, $p = 0.045$) and balancing ($t = 3.87$, $p = 0.008$) did significantly improve from "moderate confidence" to "very confident."

Objective Test	Pre-test M (SD)	Posttest M (SD)	t	sig.
Timed Up & Go (sec)	6.4 (1.2)	6.0 (1.3)	2.45	0.050
Lift & Carry (sec)	15.7 (2.1)	14.0 (2.1)	3.83	0.009
Chair Stand (sec)	10.2 (2.8)	9.2 (1.7)	1.73	0.134
Stair Climb (sec)	34.4 (5.4)	31.4 (4.6)	1.52	0.180
6-Minute Walk Test (m)	570.3 (75.0)	613.6 (56.3)	1.11	0.312

Conclusions

This novel intervention delivering eight-weeks of HIFT training to older adults was well-received and feasible, and showed promise in improving functional movement for daily tasks. Future research should compare existing fall prevention exercise programs with a HIFT program to determine comparative effectiveness as well as promote independence of older adults.

References

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