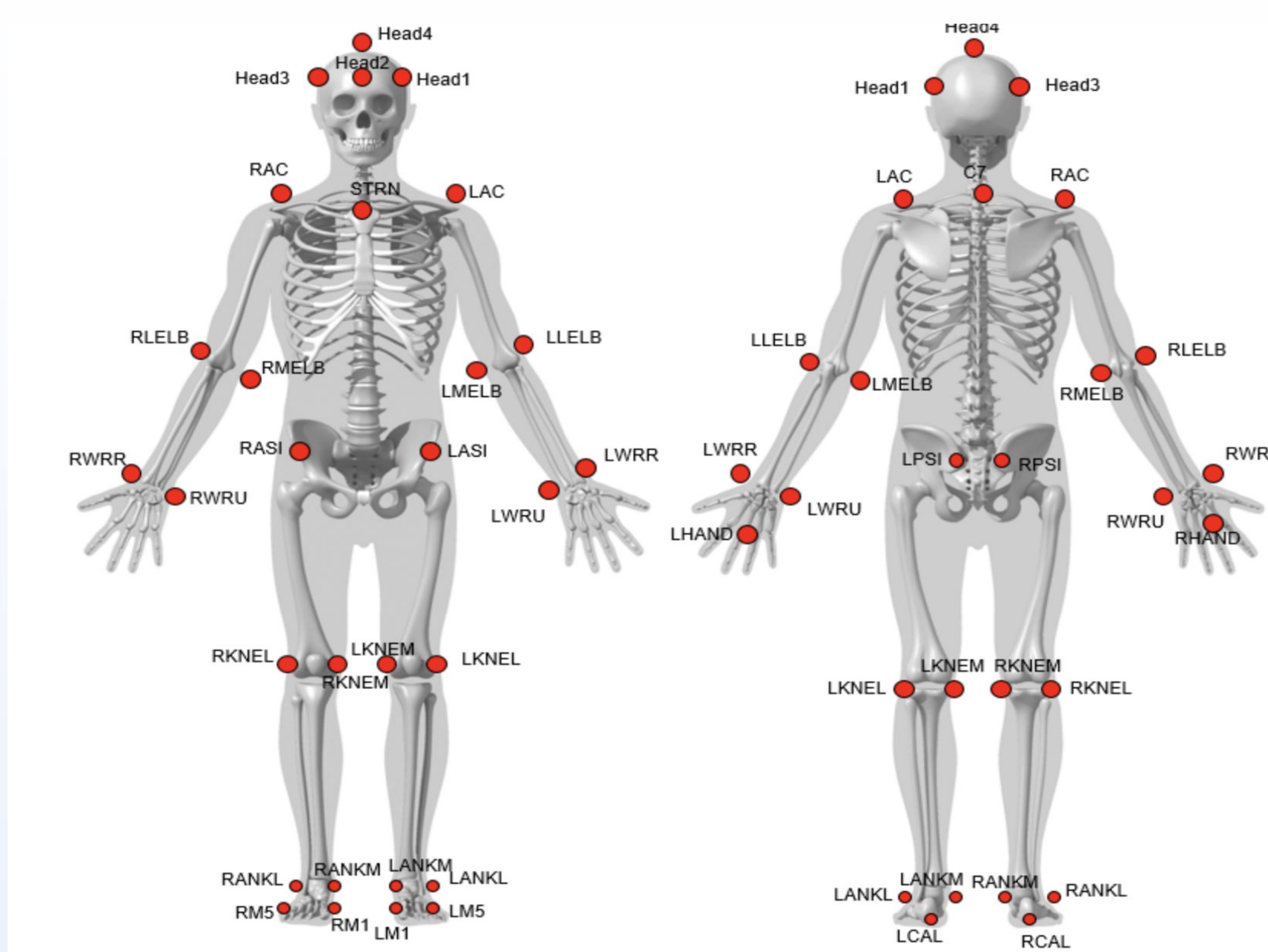




Perturbation-Based Balance Training added to a Fall Prevention Exercise Program and its Effect on Fall Risk and Fear of Falling in Community-Dwelling Older Adults

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Background

- Falls lead to decreased independence, increased disability, and increased risk of death
- Falls occur in more than one out of four older adults each year

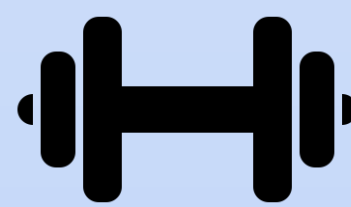
Research Suggests:

- 50 hours of a structured strength and balance exercise program supplemented with fall prevention education over 12 weeks decreases fall risk in community dwelling older adults
- One session of perturbations provided at the appropriate dosage can decrease fall risk by 50%, with multidirectional perturbations having the greatest benefit

Hypothesis:

- Adding one session of perturbation-based training to a structured strength and balance exercise program will reduce the risk of falls and fear of falling in community dwelling older adults

Methods



Experimental group:

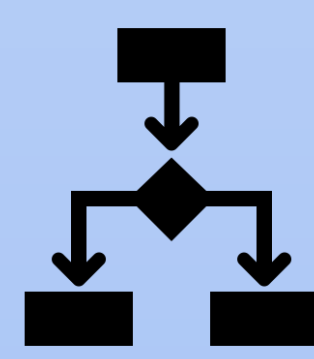
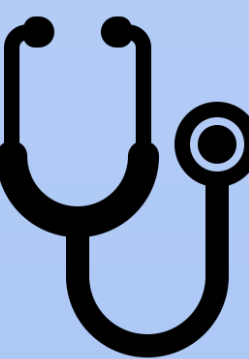
- Perturbation training in addition to 10-week evidence-based exercise program, education, and HEP

Control Group:

- 10-week evidence-based exercise program, education, and HEP

Outcome measures used:

- FES-I: Used to measure fear of falling.
- Mini-BEST Test: Used to measure fall risk



Education:

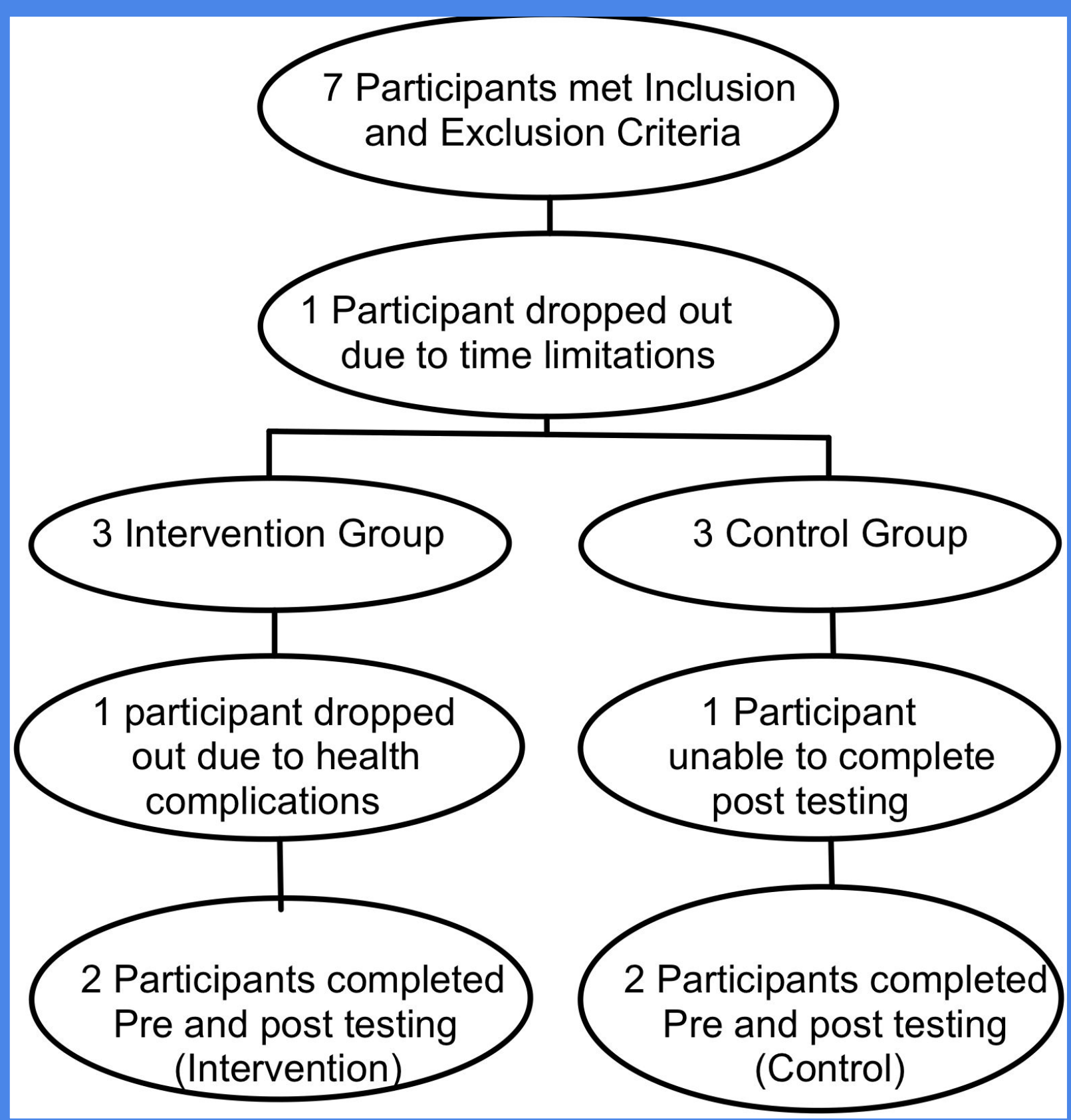
- 9 weeks of educational packets and videos about falls prevention and preparedness.

10-week exercise program:

- Four days of exercise per week
- Student-led exercise class two days per week
- HEP two days per week
- Exercise sessions consisted of a warm-up, strength, balance, and cool down exercises
- Vitals assessed before and after class for all participants
- One hour and 15-minute long classes

Perturbation Training:

- Manually applied waist pulls in the backward, left, and right directions while picking up one of 3 randomized objects placed at shin height
- Goal was to induce loss of balance



Scan for Exercise Videos



Scan for References



Results

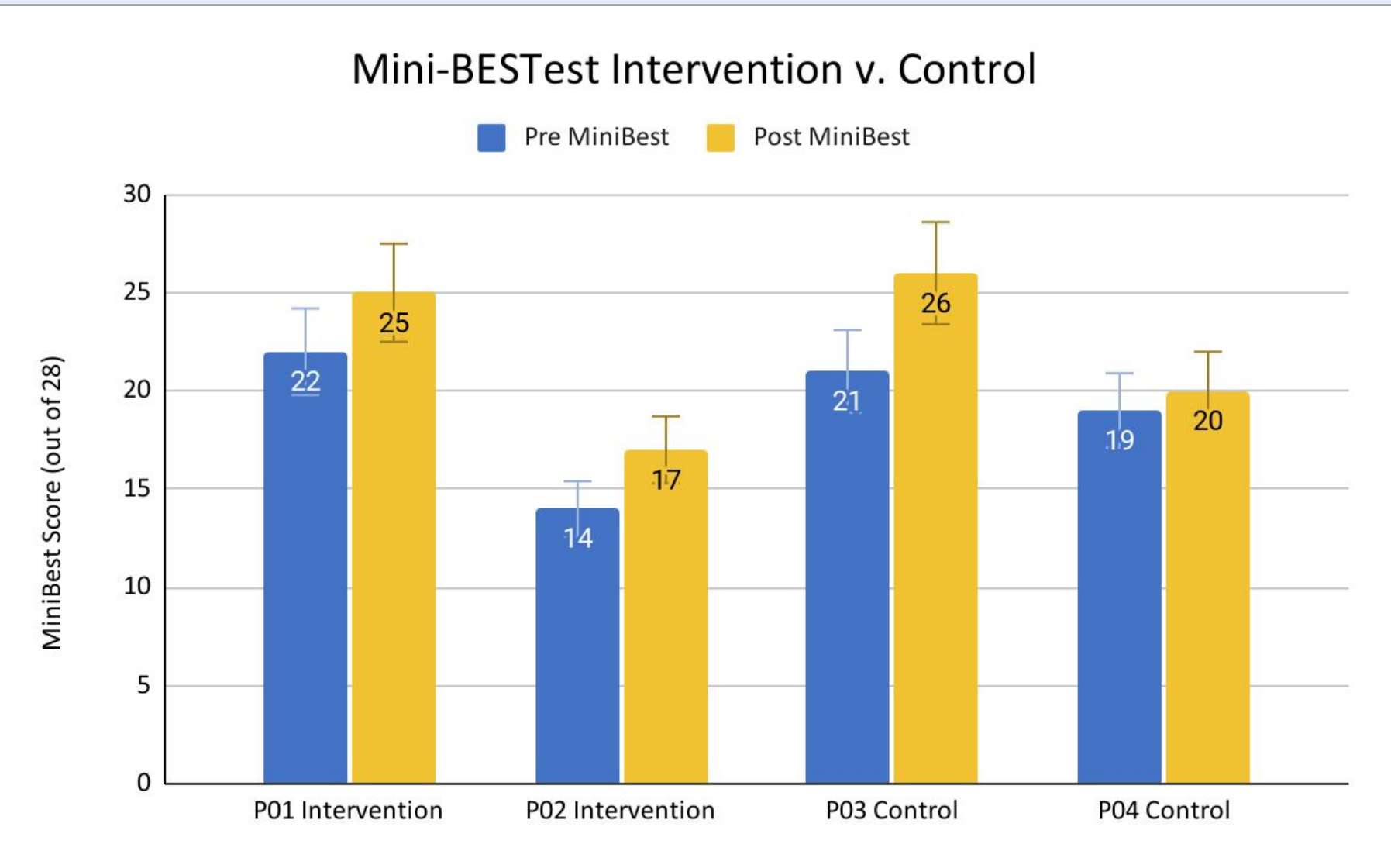


FIG. 1

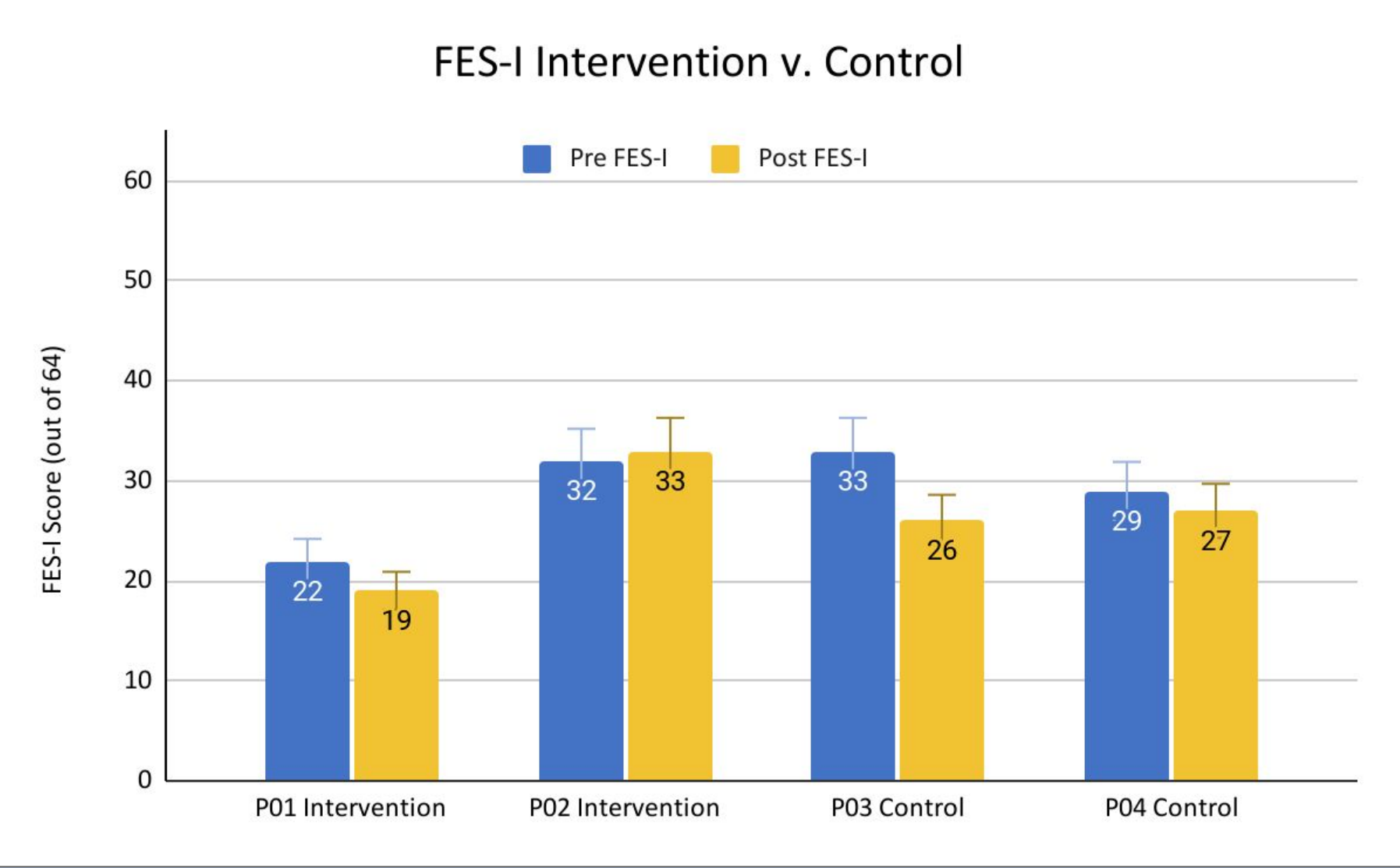


FIG. 2

Participant Demographics

- N = 4 participants
- One male to three females
- Mean age: 83.5 years
- Avg. exercise sessions attended:
 - 16/18 sessions
- Avg. home exercise program compliance:
 - 13.5/22 bouts of home exercise

KEY

Mini-BEST (FIG. 1)
Age Fall risk:
70-79 <23
80-89 <22
>90 <17

FES-I (FIG. 2)
Low concern about falls = 16-19
Moderate concern about falls = 20-27
High concern about falls = 28-64

Conclusion

Summary

- All participants had increased Mini-BEST scores, but only one had a change greater than an MCID
- Three of the four participants had decreased FES-I scores with some reporting reduced fear of falling

Limitations

- Small sample size
- Participation time was below recommended value
- Limited time to ensure participant understanding of at-home material/HEP
- Inability to standardize perturbation magnitude
- Participant health complications

Further Research

- Use of a slip-based mechanical system to perform standardized perturbations
- Increase sample size
- Ensure increased participant understanding of expectations with an additional introduction class