

Maximizing mobility in Parkinson's disease: Effects of an individualized training program on fall risk

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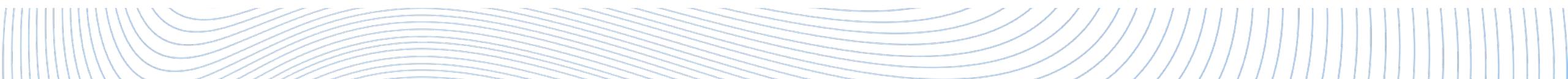
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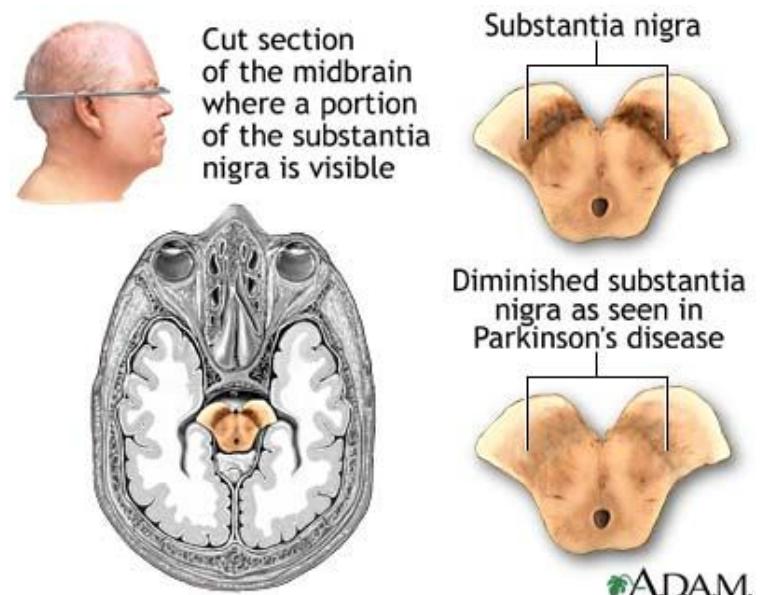
What is Parkinson's disease?

- A progressive neurological condition that causes a reduction in the amount of dopamine produced by the brain



What is Parkinson's disease?

- Dysfunction at the Basal Ganglia
 - Substantia nigra – where dopamine is produced



What causes PD?

- Unknown etiology
- Genetics
 - Believed to cause 10-15% of PD cases
 - [PD GENERation](#)
- Environmental Factors
 - Head injury
 - Exposure to pesticides



Statistics

- PD affects approximately 1.5 million Americans
- Approximately 60,000 new cases annually
 - # of cases expected to double between 2005-2030
- Men are 1.5x more likely to have PD than women

Fahn S., *Ann N Y Acad Sci*, 2003

Dorsey ER, *Neurology*, 2007

Motor Symptoms

- Cardinal signs
 - Bradykinesia
 - Tremor
 - Rigidity
 - Postural Instability





The Problem of Falls

Incidence of Falls in PD

- 45-68% of people with PD fall annually
- Approximately 66% of those who fall do so recurrently
- Falls expected to become “major health problem” with anticipated increase in number of individuals with PD

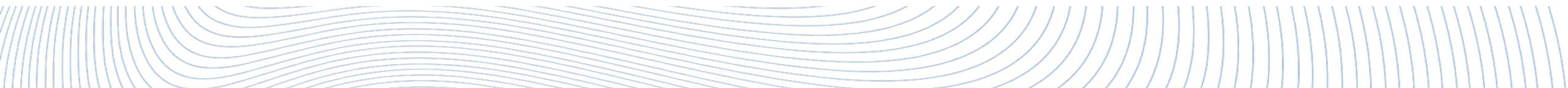
Latt MD, *Mov Disord*, 2009

Paul SS, *Mov Disord*, 2013

Wood BH, *J Neurol Neurosurg Psychiatry*, 2002

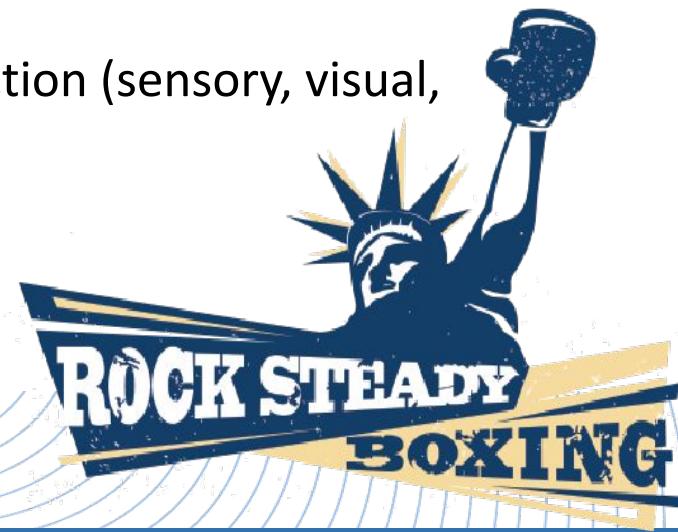
Purpose

- The purpose of this investigation was to determine if a community-based boxing training program could improve functional mobility and reduce falls in persons with mild-to-moderate PD.

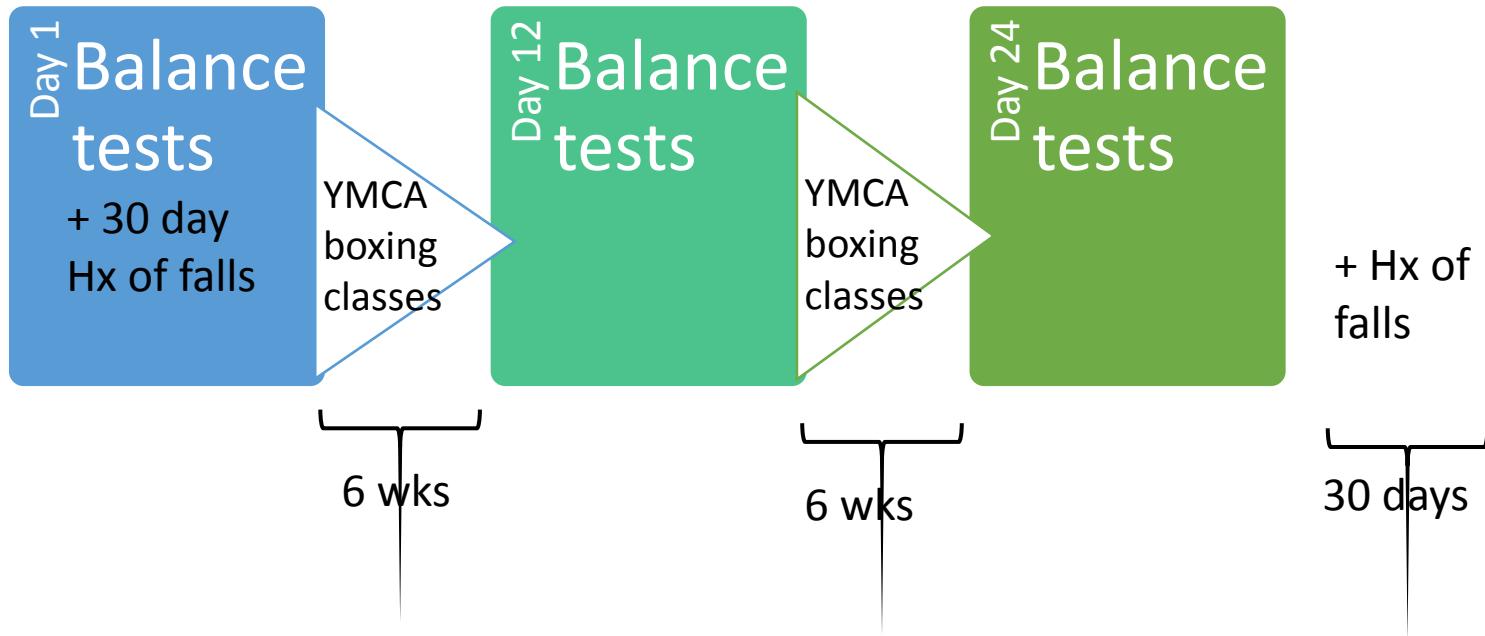


Research Study

- 12-week exercise program for individuals with Parkinson's Disease
 - Rock Steady Boxing
 - Each session involves a 45-60 minute circuit
 - Function, balance and non-contact boxing activities
 - 3-minute training bouts + 1-minute rest breaks
 - Balance program
 - Tailored to each individual's areas of balance dysfunction (sensory, visual, vestibular)
 - Working with personal trainer

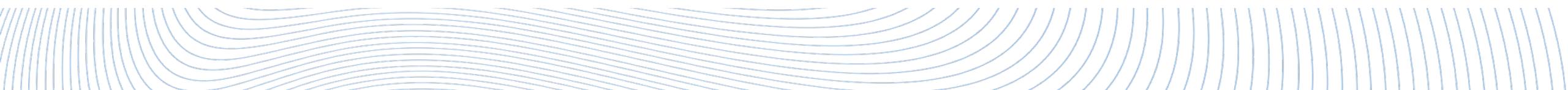


Methods



Statistical Methods

- Paired t tests on *pre* and *post* effects
- *A priori* level of significance set at 0.05
- Effect sizes calculated with Cohen's d

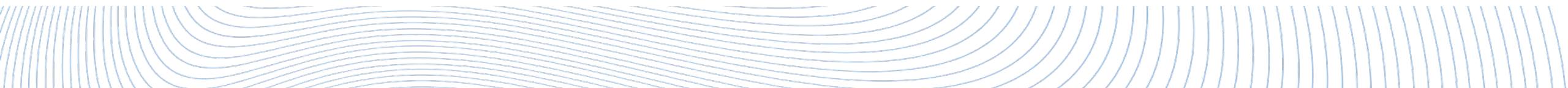






Outcome Measures

- BERG Balance Scale
- Modified Clinical Test of Sensory Integration in Balance (MCTSIB)
- Timed Up and Go test (TUG)
- Five-times Sit-to-Stand (5-STS)
- Activities-Specific Balance Confidence scale (ABC)
- History of Falls

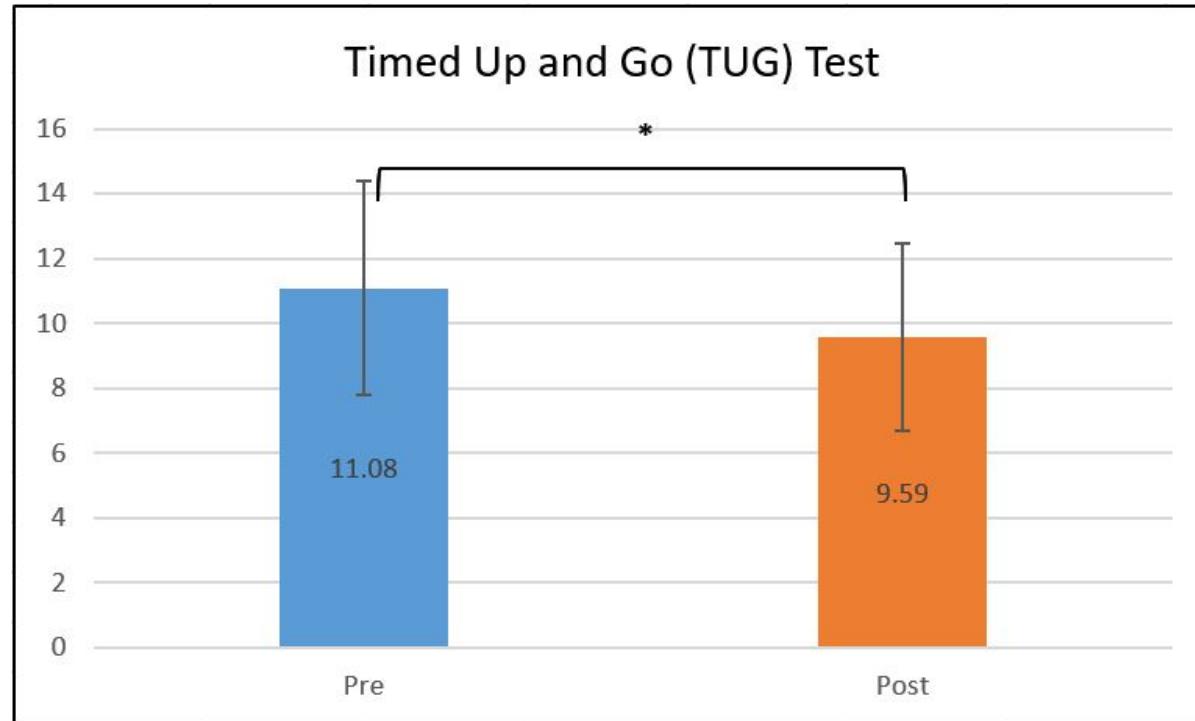
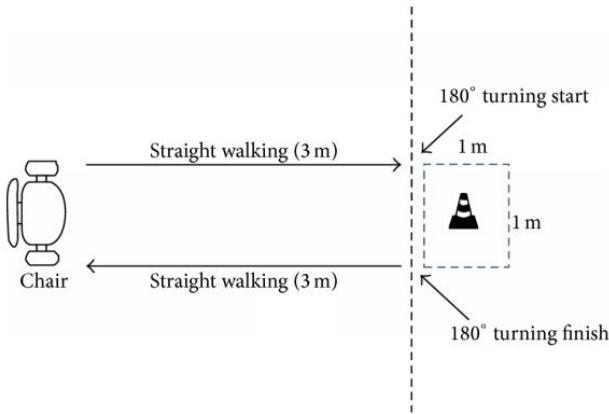


Participants

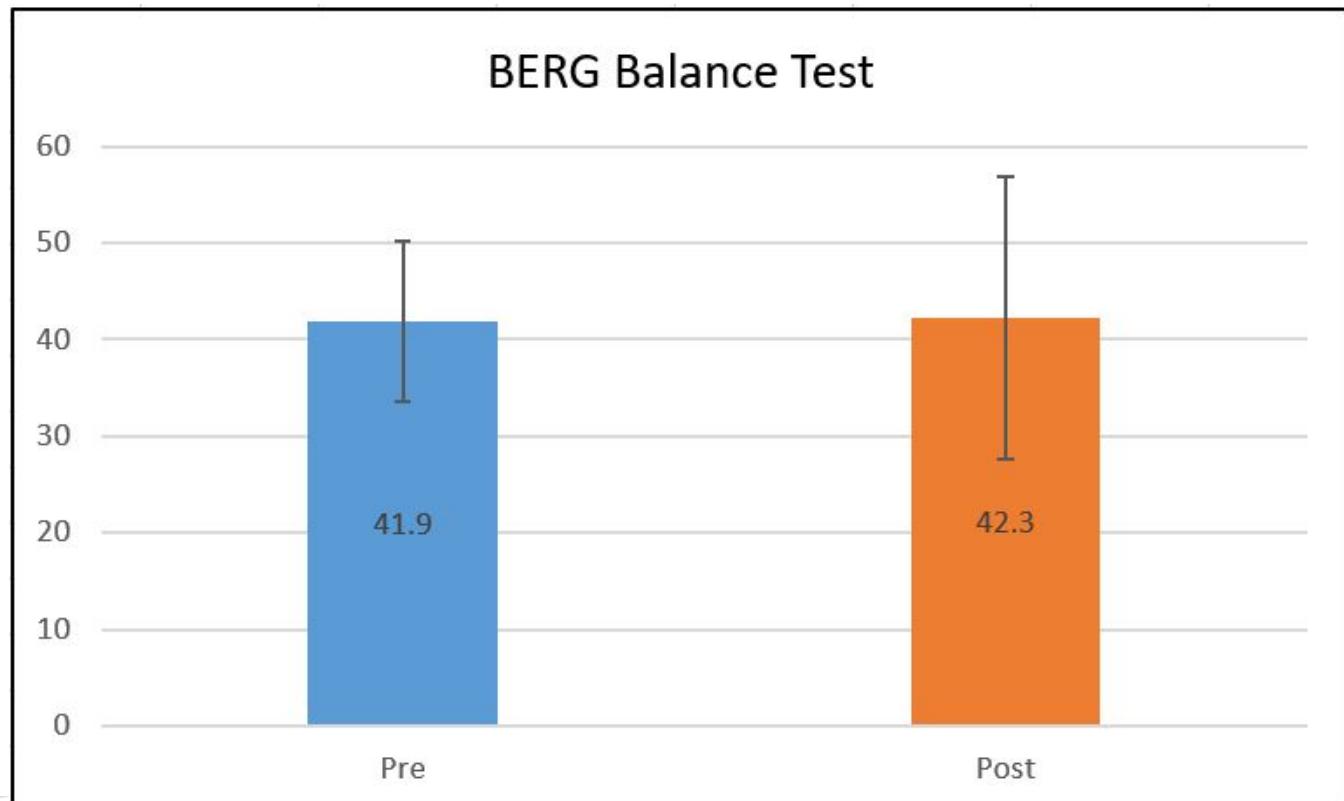
- 20 enrolled
- 19 completed all outcomes
 - 1 lost to follow-up (moved)
- 13 M, 6 F
 - Age: 71.11 ± 6.43
 - BMI: 27.86 ± 4.75
 - Hoehn & Yahr: 2.0
 - UPDRS motor score: 16.79 ± 4.96



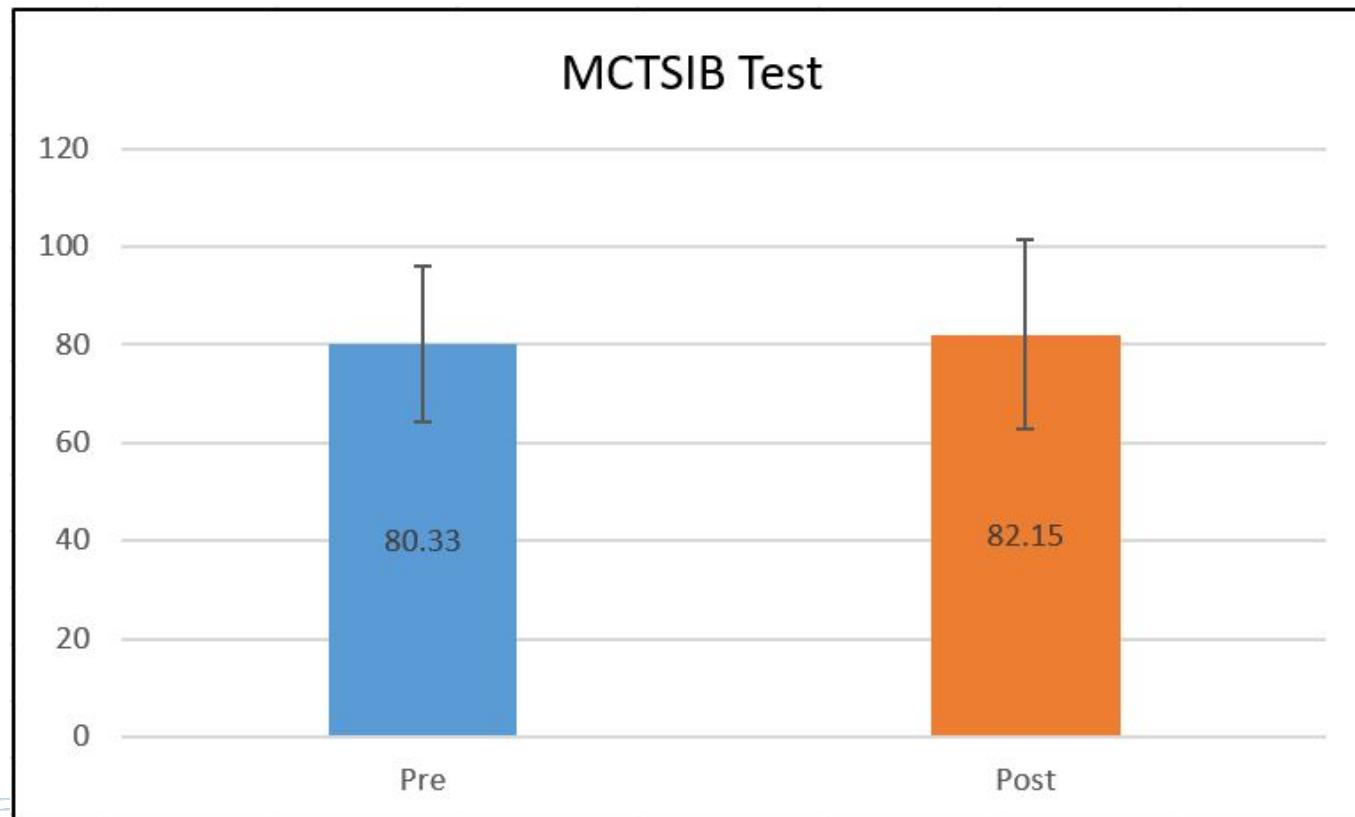
Clinical Balance Outcomes



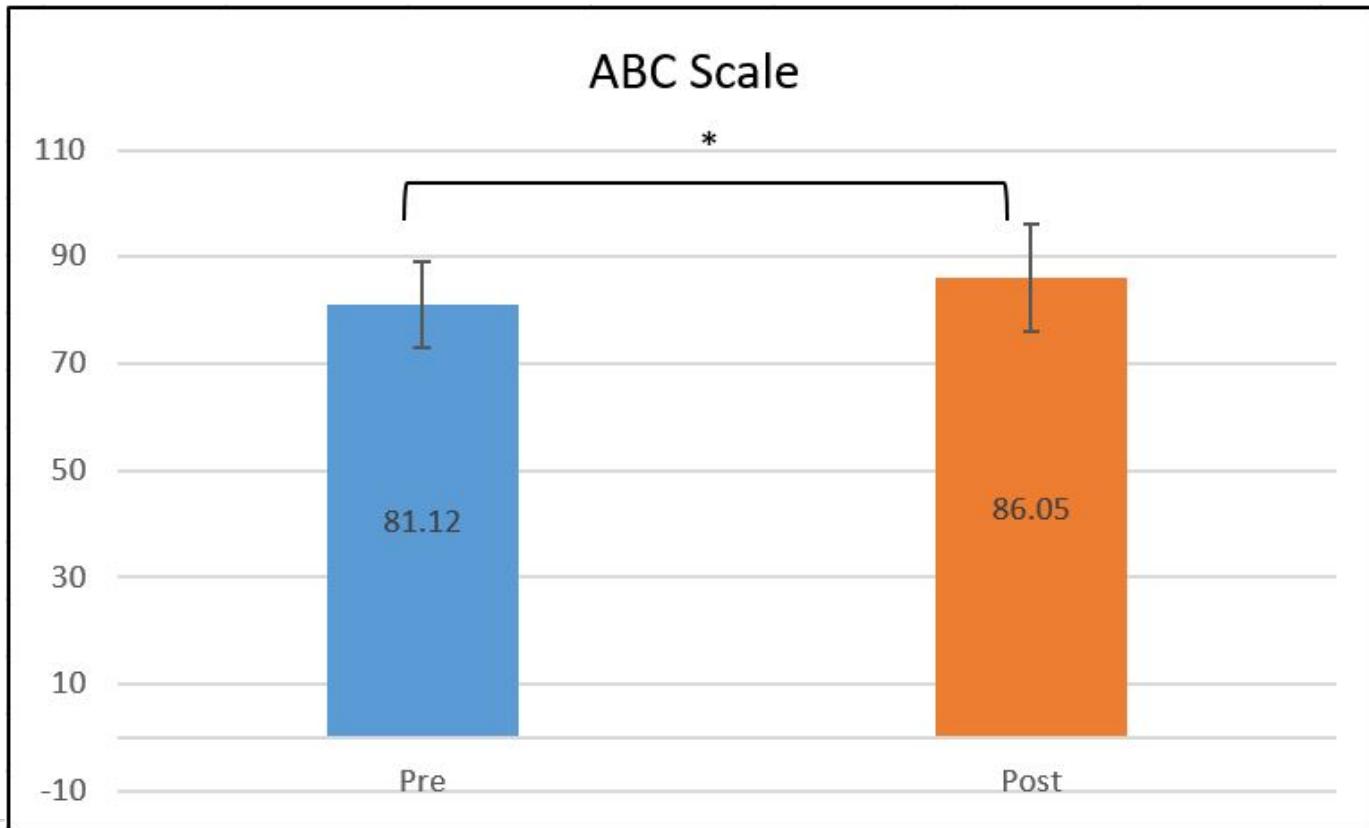
Clinical Balance Outcomes



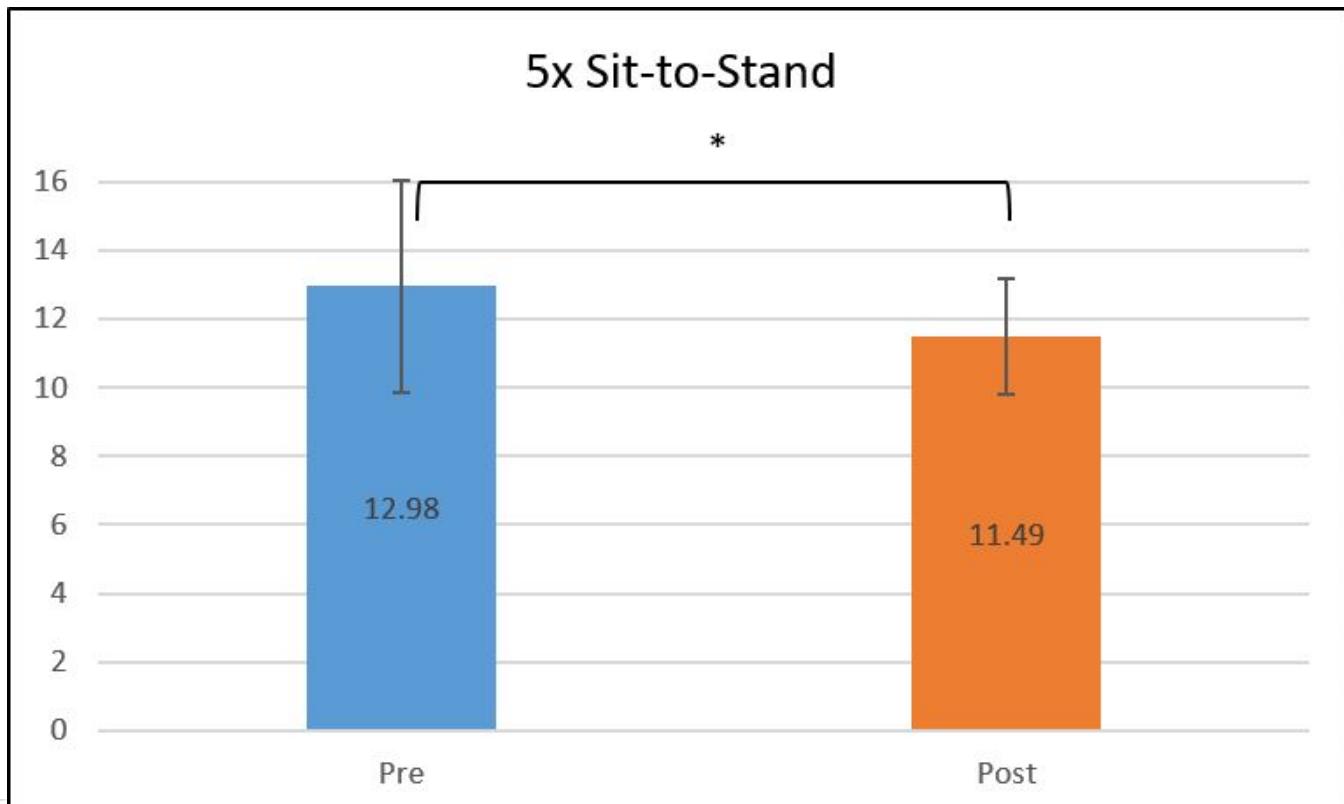
Clinical Balance Outcomes



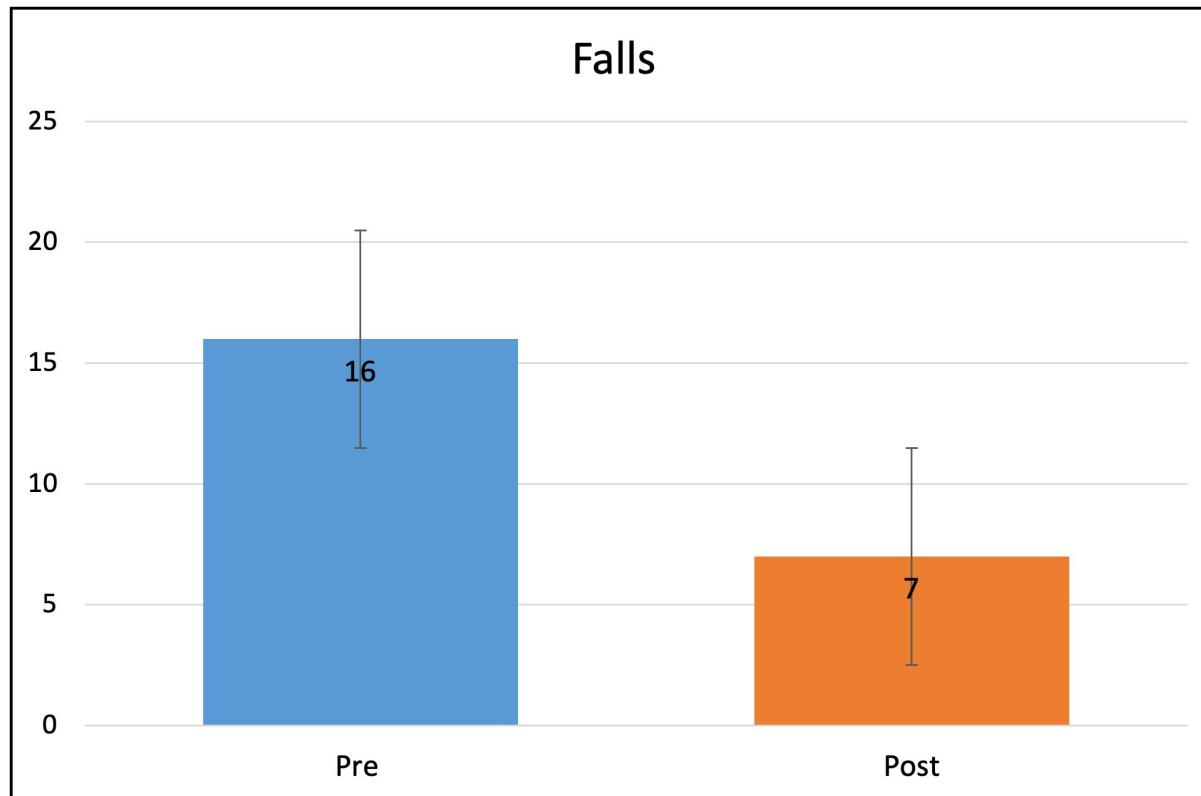
Clinical Balance Outcomes



Clinical Balance Outcomes



Clinical Balance Outcomes



Discussion / Conclusion

- Our data suggest that participation in a community-based non-contact boxing program may decrease the risk of falling for participants with mild to moderate PD.
- Participants move with greater power and fluidity, which may decrease their overall fall risk.



Woo-Ha! Gooo Rock Steady!



Questions

