



The effect of a Pilates exercise program on static and dynamic balance: A Pilot Study

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Background Information

"Falls are a threat to the health of older adults and can reduce their ability to remain independent" ("Older Adult Falls").

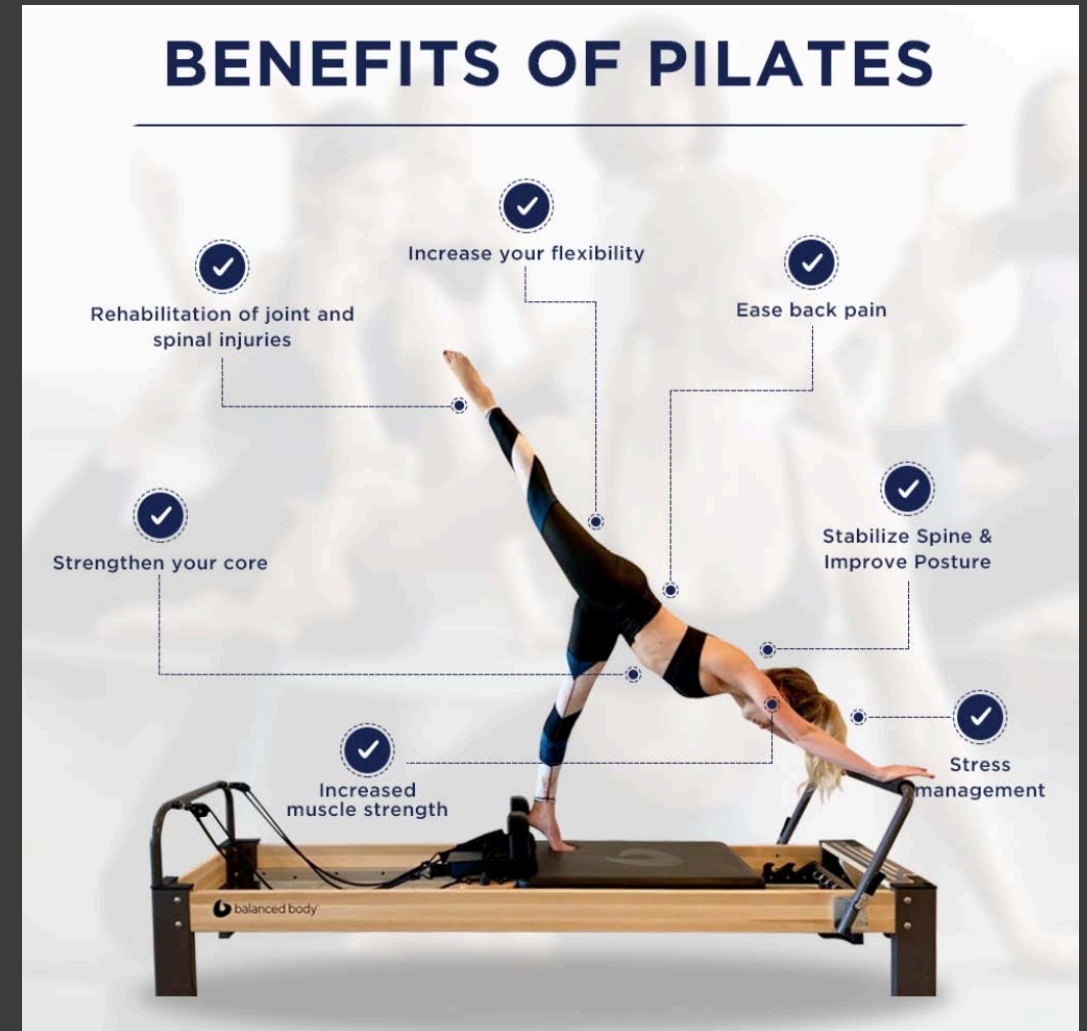
"Pilates Reformer exercises performed once per week for 10 weeks resulted in reduced fall risk and significant improvements in static and dynamic balance, functional mobility, balance self-efficacy, and lower extremity AROM in adults age 65 and older at risk for falling" (Roller et. al).

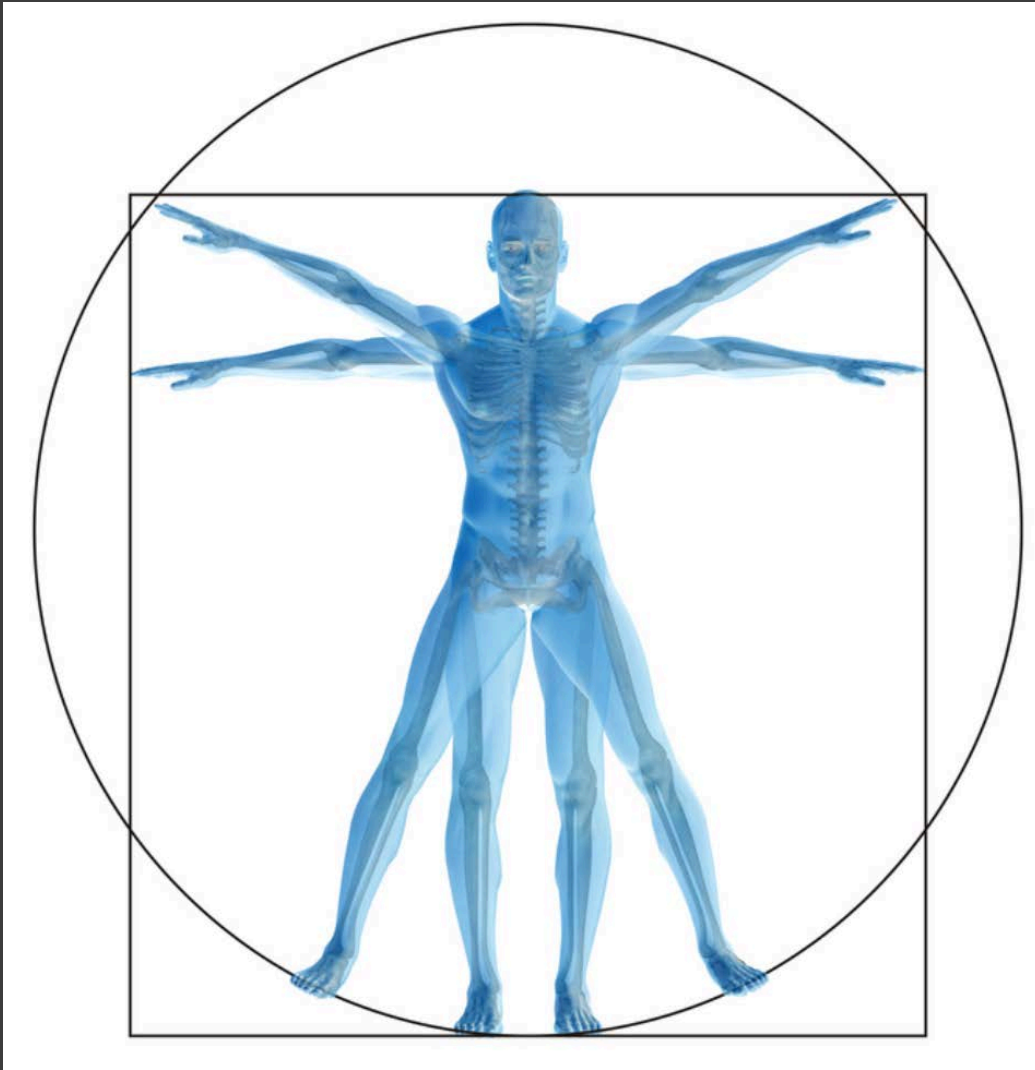
Knowing that balance is an issue faced by many older adults, our group piloted a Pilates program using the Pilates chair for individuals in this at-risk group.



What is Pilates?

- Pilates was created by Joseph Pilates
 - Involves low impact flexibility, muscular strength, and endurance movements
 - Emphasizes proper postural alignment, core strength, and muscle balance
 - Has been found to contribute to a decreased risk of falls in the elderly population
- Our program focuses on the benefits of Pilates to the aging population as it is meant to aid in balance and postural control alignment in healthy adults





Project Purpose

The purpose of this project was to assess how effective Pilates exercises were in improving static and dynamic balance as well as range of motion of the thoracic spine and ankle joint.

Subjects or Study Population

- Demographics/Anthropometrics
 - 2 healthy females over the age of 60 (63,65)
 - Subject 1 had a hip replacement that had been rehabbed (R THA 2015)
 - Subject 2 had chronic neck pain from accident ~40 years ago that is addressed by a chiropractor every 1-3 months
- Participants were excluded if they were:
 - Under 55 years old
 - Had previous Pilates experience
 - Had an acute injury or not medically able to participate in an exercise program



Study Design

- Experimental design
- 6-week training program with pre and post outcome measures taken before and after the training program, respectively
- Training program:
 - A 45-minute Pilates session with both of our subjects using the Pilates chair
 - Sessions took place twice a week
- All classes were taught by a certified Pilates instructor/Physical Therapist.



Methods

- Subjects completed a screening and informed consent form prior to participating in the study.
- Baseline measures:
 - Y-balance test
 - Multi-directional reach test
 - Romberg test on force plate
 - ROM of ankle and thoracolumbar spine
- Training Program:
 - Pilates program twice a week for 45 minutes
 - Alternating exercises with stability chair and mat work



Results

- Subjects were able to complete 5 weeks (10 sessions) of Pilates training. Subjects were not able to complete the final two sessions or outcome measures due to COVID-19.
- Improving results were qualitatively observed in our subjects throughout their 5 weeks of in-person Pilates sessions
 - Each week improvement on previous exercise
 - Exercise intensity increased each week

Discussion

Objective measures were not recorded; however, the subjects had many positive comments about their experience.

- Challenges
 - Only Dr. Gleason could effectively instruct due to certification
- Learning experiences:
 - Pilates can be performed as a rehabilitation program
 - Pilates is a challenging program with varying intensity levels

Discussion

Strengths:

- Documented exercises
- Supervised protocol
- Saw improvement
- Regular, consistent schedule



Weaknesses:

- Unable to take outcome measures or complete program
- Extremely small sample size of same sex
- No control group

Conclusions

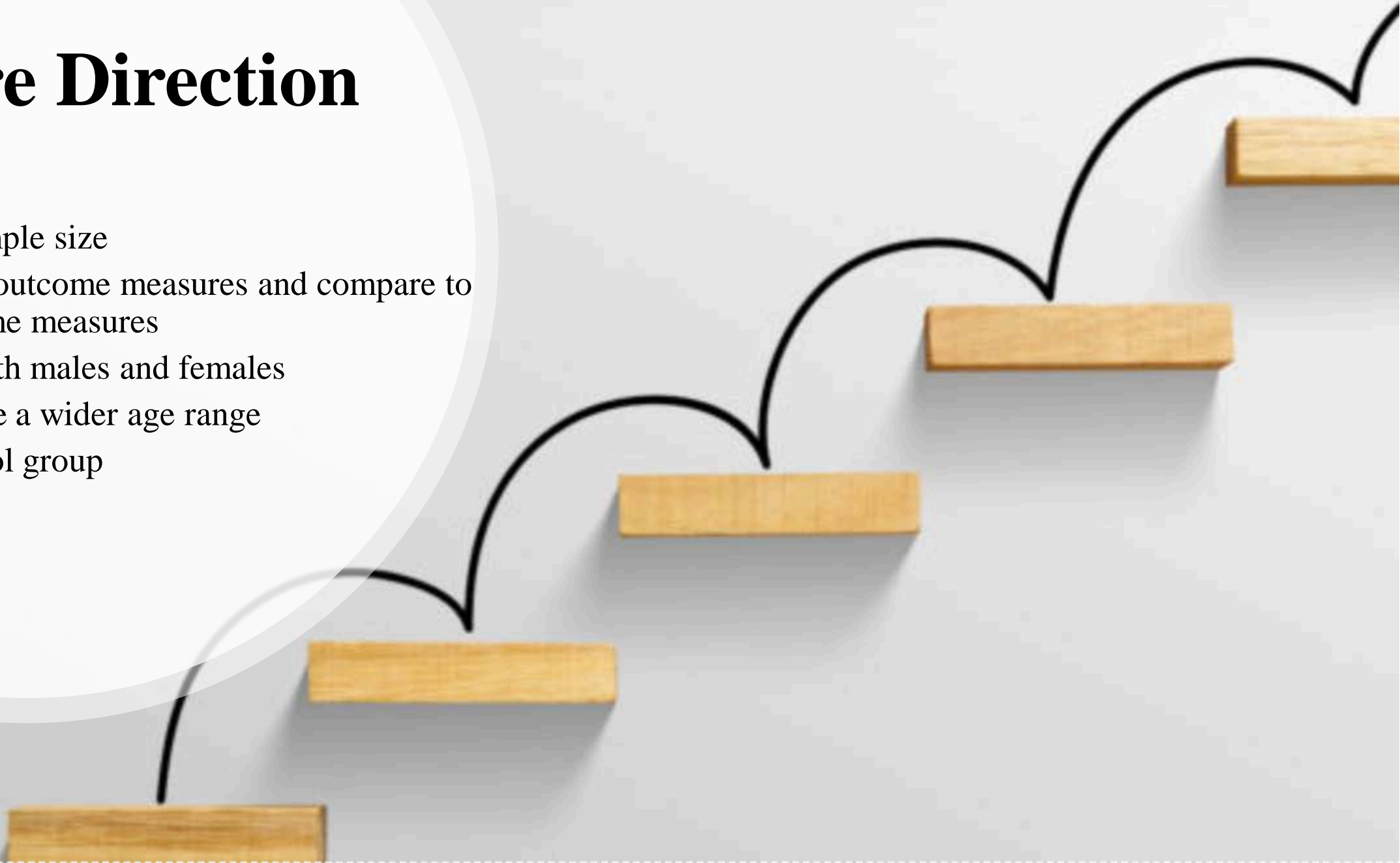
- Pilates can be used as an effective exercise tool in the community-dwelling population over 60.
- The following are comments from our two participants:
 - "I also noticed that my leg strength increased. I was better able to get up from a squatting position without having to grab on to something. I also noticed I was better able to balance on one foot."
 - "My posture improved – I stood and sat straighter with my shoulders back instead of slumped forward. My core strength definitely improved and movements that initially were difficult became much easier. I have always had a "cranky" neck and the irritation of it became less and less over time."



Future Direction

Improvements:

- Larger sample size
- Take post-outcome measures and compare to pre-outcome measures
- Include both males and females
- Incorporate a wider age range
- Add control group



Acknowledgements/Questions/Comments

- Thank you to Dr. Gleason who led this project and instructed the Pilates sessions.
- Thank you to our study participants who willingly volunteered their time to help with our study.

References

- Older Adult Falls. (2016, October 11). Retrieved from <https://www.cdc.gov/HomeandRecreationalSafety/Falls/index.html>
- Roller, M., Kachingwe, A., Beling, J., Ickes, D.-M., Cabot, A., & Shrier, G. (2018, October). Pilates Reformer exercises for fall risk reduction in older adults: A randomized controlled trial. Retrieved April 21, 2020, from <https://www.ncbi.nlm.nih.gov/pubmed/30368346>