

Maintaining Balance Through Fitness Fun



**NATHAN LUCHERINI, AUBREY LINDORFF,
TIFFANY DYCUS, MARCUS PARKER, AND ROB
TOTTEN**

Slide Show

Background



- The risk for falls increases dramatically with age. Approximately 25% - 35% of people over the age of 65 years experiences one or more falls each year (Shumway-Cook, 1997).
- The Berg Balance Test has been shown to have moderately good sensitivity, and high specificity, and therefore is a good predictor of older adults who may have fall risks and may need assistive devices (Zwick, 2000).

Background cont.



- According to Ringsberg et al. (1999) it was found that quad strength did not actually improve balance
- If individuals have a fear of falling, this leads to increased number of falls



Purpose



- The purpose of the current study is to assess whether or not a balance focused exercise program would improve or maintain balance.



Research Questions



1. Does balance improve with physical activity, or just maintain balance?
2. Will a balance centered program improve perceived balance?



Methods



- N=20; 10 control (3 male, 7 female) 10 exercisers (3 male, 7 female)
- Average age of exercisers=73.1 Average age of control group=78
- One hour class 2 days a week
- Exercises chosen were based on strengthening large muscle groups used in everyday activities (Evans, 1999)
- Participants used weights and resistance bands for upper body resistance training and exercise balls for core strength including:

Wall squats

Single leg hip extension

Bend and reach

Forward and lateral lunges

Calf raises

Crunches

Hip adduction and abduction

Balance on one foot

Push-ups on chairs

Toe circles

Bicep curls

Tricep extension

Lateral raises

Overhead press

Methods cont.

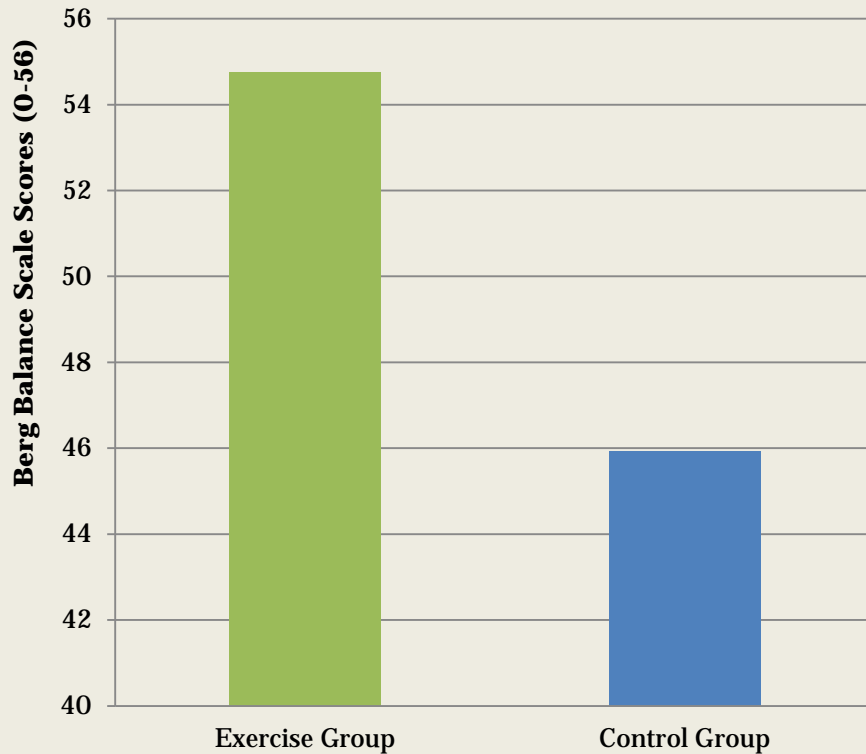


- Initial balance was measured using the Berg Balance Scale at the beginning of the class
- Retested exercisers after the exercise program
- Exercises were varied each class to enhance motor skill flexibility (de Bruin, 2007)
- Balance exercises led to improvements in static balance function (Shimada, 2003)
- Data analysis conducted using a t-test

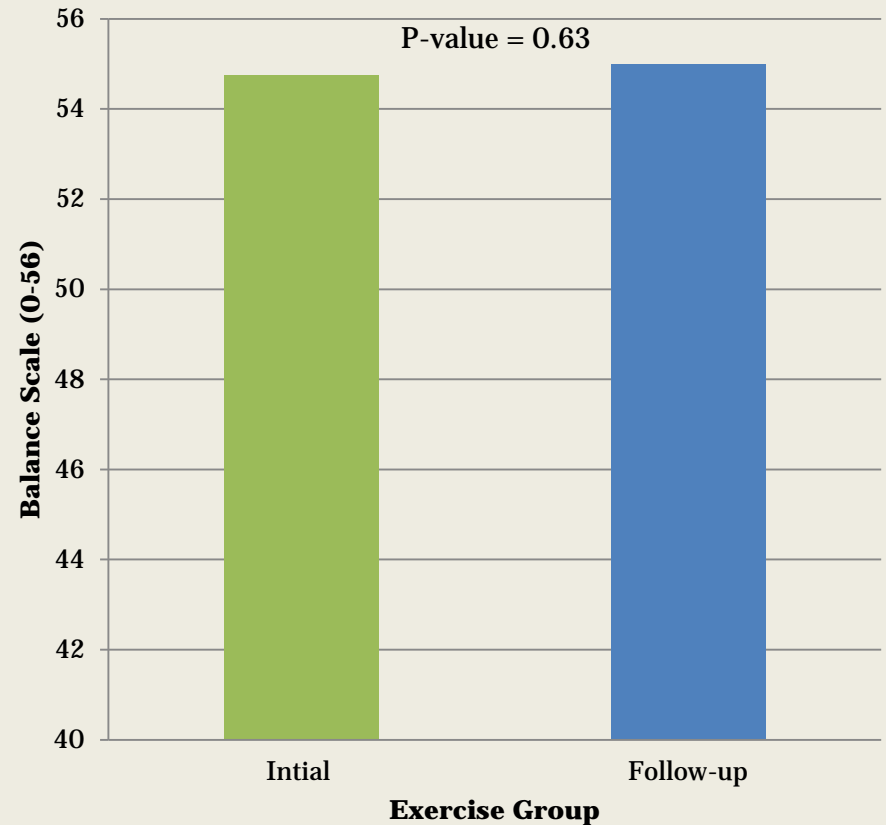
Results



Average Berg Balance Scores Exercise vs. Control Group



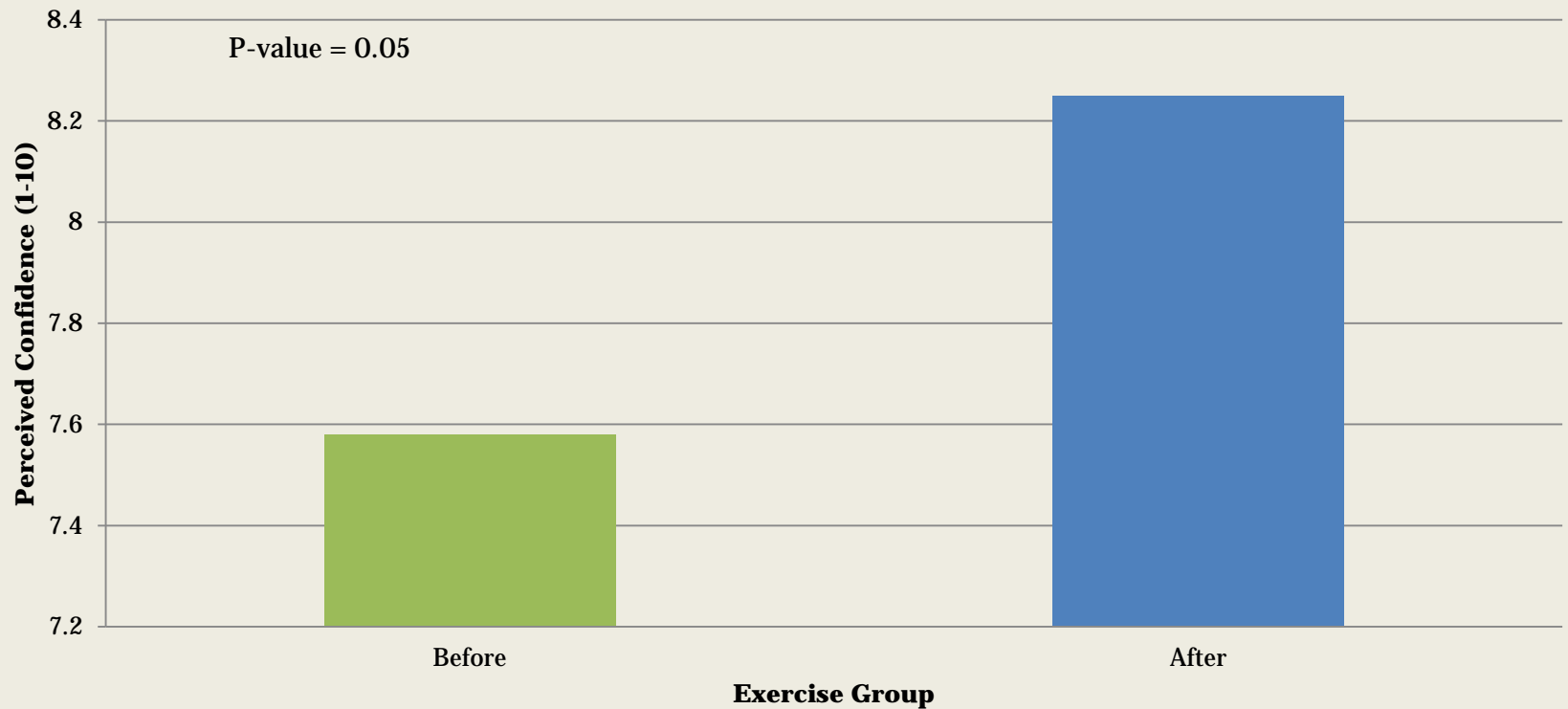
Berg Balance Scale Scores Before and After Exercise Intervention



Results cont.



Perceived Confidence in Balance Before and After Exercise Intervention (1 = Low; 10 = High)



Discussion



- In response to research question #1, on average, each one of our participants either maintained or improved their results on the Berg Balance Scale
- In response to research question #2, we discovered that perceived balance of our participants improved after our interventions



Discussion cont.



- One participant had a hip replacement, but was still able to achieve a perfect score on the Berg Balance Scale, and maintained her perceived balance due to her own personal physical activity.
- Average scores on the Berg Balance Scale for the exercisers was 54.75 compared to 45.91 for the control group
- Although not a significant increase, the average scores increased from 54.75 to 55 out of a possible 56 points.

Discussion cont.

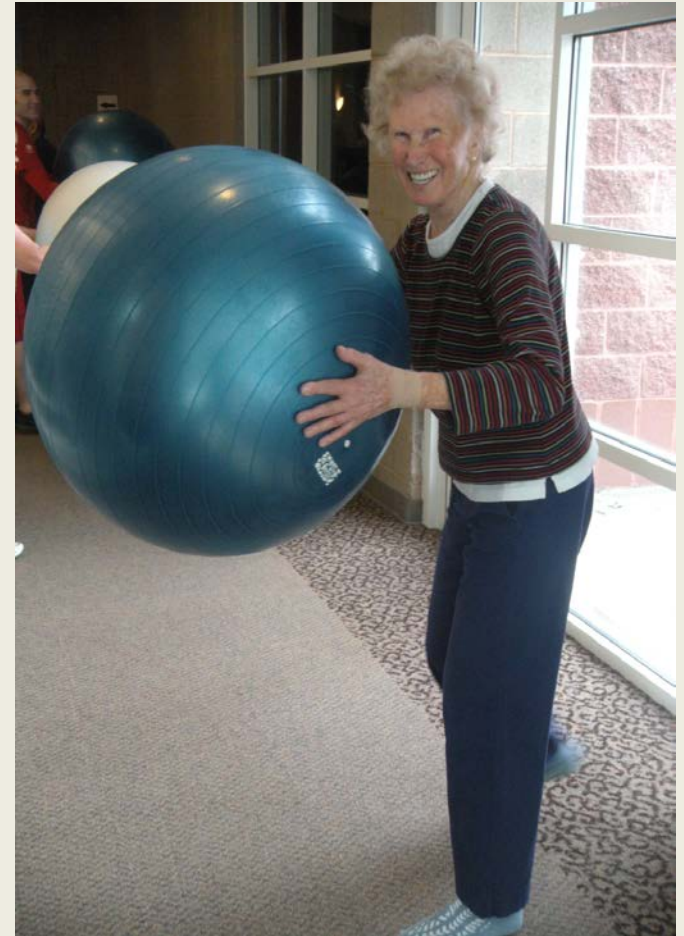


- While the p-value for pre- and post-intervention was only 0.63 and not statistically significant, we found it to be clinically significant
- Similar to Arfken et al. (1994), we found that perceived confidence in balance improved with exercise and helped reduce the fear of falling
- Similar to Evans (1999) we found that resistance training would help slow the syndrome of physical frailty

Limitations



- Small sample size
- Length of study
- Exercisers had already been exercising before the test
- Motivation of control group
- Surgeries
- Broad age group
- Inconsistent attendance
- Possible ceiling effect with Berg Balance Scale



Implications and Future Directions



- In the future, a longer study needs be done to assess the long term effects of physical activity on balance using a slightly more difficult balance test.
- In the future, a study using 2 groups of non-exercisers and assigning one group to exercise and one to be a control, then implementing your own program.
- These findings helped the authors realize that even though participants knew the benefits of physical activity, it still didn't motivate them enough to do it on their own.

Implications and Future Directions cont.



- Do not correct form right off the bat
- Be open, friendly, enthusiastic and have respect
- Incorporate more cardio, such as dance, to get them moving more and make the class more exciting
- Keep it fun!
- Use more of a longitudinal type study in the future
- Use a more difficult test, one that doesn't have ceiling effect

Diversity



- There is a wide spectrum of levels of physical activity and abilities of older individuals
- There was an overwhelming amount of optimism and enthusiasm from the group, contrary to negative stigma placed on all older adults as being pessimistic or angry
- Many of the participants were fairly knowledgeable about the benefits of exercise
- Some controls were indifferent about improving their balance
- We should not stigmatize because attitudes among individuals are variable. Some are highly motivated, others want to change but have no motivation, and some are indifferent

References



- Arfken, C.L., Lach, H.W., Birge, S.J., & Miller, J.P. (1994). The Prevalence and correlates of fear of falling in elderly persons living in the community. *American Journal of Public Health, 84*(4), 565-570
- de Bruin, E.D., & Murer, K. (2007). Effect of additional functional exercises on balance in elderly people. *Clinical Rehabilitation, 21*, 112-121.
- Evans, W.J. (1999). Exercise training guidelines for the elderly. *Medicine and Science in Sports and Exercise, 31*(1), 12-17.
- Ringsberg, K., Gerdhem, P., Johansson, J., & Obrant, K.J. (1999). Is there a Relationship between balance, gait performance and muscular strength in 75-year-old women?. *Age and Aging, 28*, 289-293.
- Shimada, H., Uchiyama, Y., & Kakurai, S. (2003). Specific effects of balance and gait exercises on physical function among the frail elderly. *Clinical Rehabilitation, 17*(5), 472-479.
- Shumway-Cook, A., Gruber, W., Baldwin, M., & Liao, S. (1997). The Effect of multidimensional exercises on balance, mobility, and fall risk in community-dwelling older adults. *Physical Therapy, 77*(1), 46-57.
- Zwick, D., Rochelle, A., Choksi, A., & Domowicz, J. (2000). Evaluation and treatment of balance in the elderly: a review of the efficacy of the berg balance test. *NeuroRehabilitation, 15*(1), 49-56.