



# The Effects of a 5-week Core Focused Exercise Program on the Static Balance and Perceived Quality of Life in the Elderly Population



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## Abstract

**PURPOSE:** The aim of this research is to determine if a five week core focused exercise program increased the balance and overall perceived quality of life in the elderly population. The decline of bone density in the elderly population increases their risk of injuries resulting in hip fractures from accidents that are caused by frequent falls. Research has shown an increase in the elderly population's balance due to muscle strengthening of the lower extremity through various exercise programs. However little research has been done on whether a core focused exercise program has a positive effect on the balance of the elderly population.

**METHODS:** Participants included ten volunteers (85 ± 10 years of age) who were recruited from an independent living community in Roseville, Minnesota. They attended the exercise program for five weeks, a minimum of two days per week, for 30 minute sessions. The program consisted of a 5 minute warm up, 20 minutes of resistance and balance training, and a 5 minute cool down. The Berg Balance Scale as well as the Perceived Quality of Life Assessment were both conducted before and after the completion of the exercise program.

**RESULTS:** Paired Sample t-tests were compared using the SPSS software with an accepted statistical significance of  $p \leq 0.05$ . Significance was not found for the Berg Balance scale test ( $p=.063$ ), perceive Physical State ( $p=.52$ ), perceived Mental/Emotional State ( $p=.718$ ). Significance was found for perceived Stress evaluation ( $p=.030$ ).

**CONCLUSION:** Data indicated that there was no statistical significance shown in balance improvement. Even though there was no significance demonstrated in balance, 9 of 10 subjects increased their balance along with statistical significance in decreased stress evaluation. The decreased stress with moderate increase in balance may lead to a confident gait which will lead to decrease in falls and increased quality of life.



## Introduction

The aim of this study was to give the researchers an opportunity to gain a greater understanding of aging populations and how age-related decline in function affects daily life. Natural physiological changes occur as an individual ages. Such changes are influenced by genetics, the environment, and the degree of activity the person maintains throughout life. One of those physiological changes is sarcopenia. Sarcopenia is a loss of muscle mass, strength and contractile speed (Ehrman, Gordon, Visich, & Keteyian, 2009). The combined effects of sarcopenia and lack of physical activity leads to declining balance in the elderly population. Lack of balance is a major contributor to falls which is a leading cause of injury, disability, and death (Ehrman et al., 2009). The elderly can and should participate in regular physical activity. The elderly have the ability to adapt and respond to both endurance and strength training (Mazzeo & Tanaka, 2001). Through exercise programs older adults are able to increase muscle mass, strength, power, and endurance especially if they were sedentary before the program (Faulkner, Larkin, Claffin, & Brooks, 2007). Research has also shown that exercise reduces risk for cardiovascular disease, hypertension, type 2 diabetes, some cancers, anxiety, depression, and falls (Nelson et al., 2007). A major goal in prescribing exercise for the elderly is to combat the frailty that is easily developed due to an increasingly more sedentary life style and the natural occurrence of sarcopenia (Faulkner et al., 2007). In order to improve balance and reduce the risk of falls we worked with the Regional Wellness Director of Presbyterian Homes to implement an exercise program for our subjects.

## Methods

The five week core exercise program was conducted three days a week, thirty minutes each session. Attendance was taken at the end of each class period to ensure accurate representation for statistical analysis at the conclusion of the study. Participants were encouraged to maintain an upright posture and to engage their core muscles during exercises and activities. The exercise protocol consisted of a Warm Up, Seated exercises with balls, Standing Exercises with chair assistance and a Cool-Down. Warm-Up consisted of a Neck Stretch held for 5 seconds on the left and right and a 20 second simultaneous Neck Roll from left to right avoiding neck extension, a Shoulder Shrug with alternating anterior and posterior rotation, and Seated Marches for 30 seconds followed by lateral and medial ankle rotations of each ankle. The exercises following the warm up consisted of Seated Crunches, Seated Oblique Twists, Elbow to Knee Twists, Knee Extensions, Twist and Squats, Weight Shifts, Arm Raises with ball resistance, Tricep Dips, Inner Thigh Ball Squeezes, Sit to Stands, Standing Marches, Squats, Calf Raises, Butt Kickers, Step-Ups, Dynamic Lunges, and Lateral Leg Lifts. The Cool-Down mirrored the Warm-Up with the addition of subjects placing a ball between their back and the back of the chair giving themselves a seated back massage. Three weeks into the exercise program the order of exercises were changed to prevent subjects from becoming desensitized to the routine. At completion of exercise program participants Berg Balance Scale Scores and perceived Stress evaluation were performed by the same evaluator as Pre-Intervention.

Figure 1: Comparison of Pre and Post Intervention Berg Balance Scale Averages

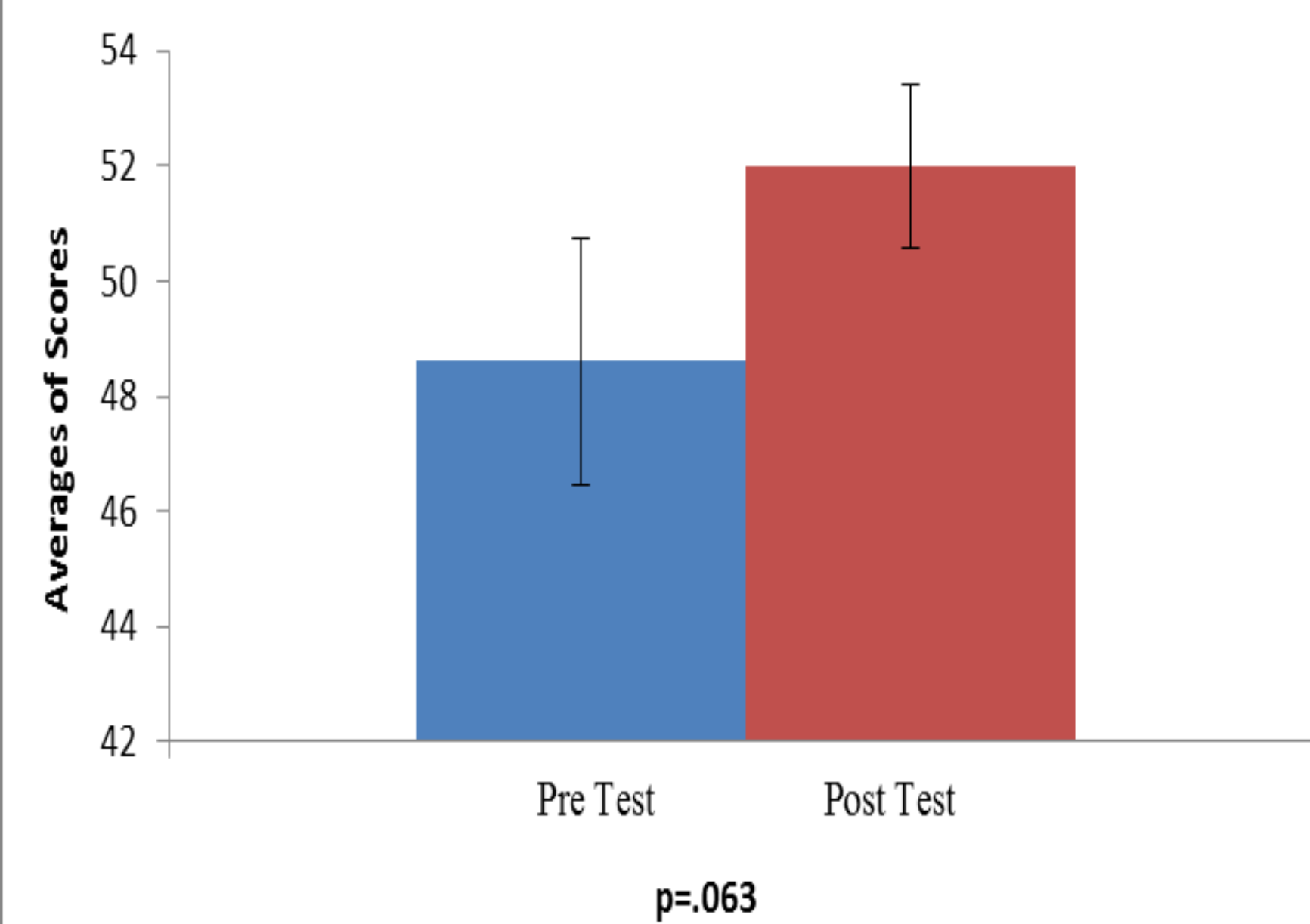
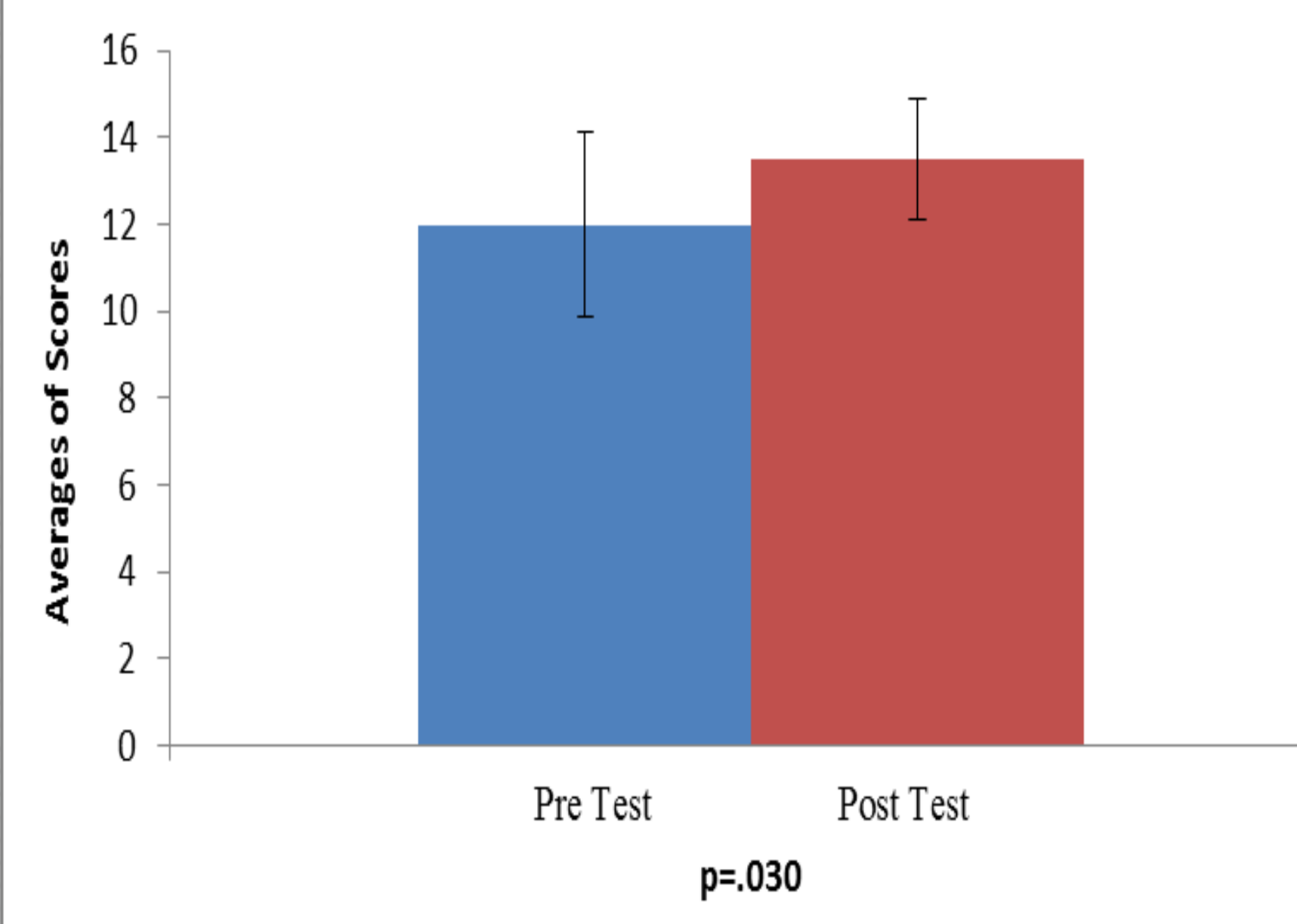


Figure 2: Comparison of Pre and Post Intervention of Perceived Stress Evaluation Averages



## Conclusion

Our results did not show statistical significance for the Berg Balance scale assessment. However out of the 10 subjects tested 9 showed an increase of balance determined by their post-test Berg Balance scale results. Our results did not show significance for the Quality of Life assessments perceived Physical State or perceived Mental/Emotional evaluation. Results did however show significance for the Quality of life Assessments perceived Stress evaluation. Decreased levels of stress reduces the risk for cardiovascular diseases that could lead to the likelihood of sarcopenia and other physiological diseases. Though significance was not found in balance during the 5 week intervention, we hypothesize that a long-term core exercise program may show an increase in balance.

## Results

The analysis was carried out using a Paired Sample t-test with an accepted statistical significance of  $p \leq 0.05$ . Our Paired Sample t-test of the Balance Berg Scale Test results of all 10 participants resulted in ( $p=.063$ , Pre Test=48.6±2.121, Post Test=52±1.414). When measuring the quality of life assessment, 8 of the 10 participants results were used to measure their perceived Physical State, ( $p=.52$ ). Perceived Stress evaluation, 6 of the 10 participants results were used ( $p=.030$ , Pre Test=12±2.12, Post Test=13.5±1.414). Perceived Mental/Emotional evaluation of the quality of life assessment 7 of the 10 participants results were used ( $p=.718$ ).

## References

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