**The effects of a supervised multimodal exercise program on anterior and lateral abdominal muscles size and functional ability in older adults: A randomized controlled trial**

**Background:** Age-related decline in the size of anterior and lateral abdominal muscles [1] are associated with reduced balance and increased falls risk [2]. The effectiveness of training the peripheral musculature for falls prevention in older adults is well-established [3]. However, little is known about the effect of exercise programs targeting lower trunk musculature particularly anterior and lateral abdominal muscles on functional ability in older adults. **Objectives**: To explore the effectiveness of including trunk strengthening/motor control exercises into a 12-week supervised exercise program comprising walking and balance exercises, on anterior and lateral abdominal muscles size, and functional ability in healthy older adults. **Methods:** This study involved a single-blinded parallel group randomized controlled trial. Sixty-four older adults (mean (SD) age: 69.8 (7.5) years; 59.4% female) were randomized to receive a 12-week supervised multimodal exercise program comprising walking and balance exercises with or without trunk strengthening/motor control exercises. Lateral abdominal muscles thickness and Rectus abdominis cross-sectional area (CSA), were assessed using ultrasound imaging. Functional and balance outcomes were assessed using 30-second Chair Stand Test, Sitting and Rising Test, Berg Balance Scale, and Multi-Directional Reach Test. Consistent with the intention-to-treat principle, all data was analyzed using a linear mixed model. **Results:** After 12 weeks of the exercise program, the trunk strengthening exercise group experienced larger increases (mean difference[95% CI]) in the thickness of total lateral abdominal muscles (0.63[0.40 to 0.85] cm) and the CSA of rectus abdominis muscle (2.08 [1.28 to 2.89] cm2) as well as 30-Second Chair Stand Test (5.9[3.3, 8.4] repetitions), Sitting and Rising Test (1.2 [0.22, 2.2] points), Forward Reach Test (4.2 [1.8, 6.6] cm), and Backward Reach Test (2.4 [0.22, 4.5] cm) outcomes, compared to the walking-balance exercise group. **Conclusion:** These findings support the inclusion of trunk strengthening/motor control exercises as part of a multimodal exercise program in older adults.

**References:**

[1] Y. Fukumoto, T. Ikezoe, Y. Yamada, et al. Age-Related Ultrasound Changes in Muscle Quantity and Quality in Women. *Ultrasound Med Biol*., 2015, 41(11), pp 3013-7.

[2] DE. Anderson, E. Quinn, E. Parker, BT. Allaire, JW. Muir, CT. Rubin, et al. Associations of Computed Tomography-Based Trunk Muscle Size and Density With Balance and Falls in Older Adults. *J Gerontol A Biol Sci Med Sci*., 2016, 71(6), pp 811-6.

[3] C. Tofthagen, C. Visovsky, DL. Berry. Strength and balance training for adults with peripheral neuropathy and high risk of fall: current evidence and implications for future research. *Oncol Nurs Forum*., 2012, 39(5), pp 416-24.

Which of the following methods you prefer for your presentation:

Poster Oral