IS TRUNK STRENGTH ASSOCIATED WITH FUNCTIONAL MOBILITY IN OLDER WOMEN?

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BACKGROUND AND AIM: Age-related declines in muscle strength have been associated with reduced functional capacity, postural instability and increased risk of falls in older adults. Studies have generally focussed on the significance of lower limb strength, however more recently the importance of trunk muscle strength has been explored, which may have been previously overlooked (Granacher et al., 2013). A limited number of studies have investigated the relationship between trunk strength and function, but this was tested under isometric contractions (Shahtahmassebi et al., 2017). Therefore, the purpose of this study was to investigate the relationship between dynamic (concentric) trunk strength and functional mobility in older women.

METHODS: A sample of 40 older women (age: 68.9±3.73 years) participated in this study. To assess functional mobility, participants completed the timed up and go (TUG), 30 second chair stand test (CST), and a timed stair climb task (ascent and descent). Both self-selected normal and fast gait speed (GS) were also recorded. Concentric trunk flexion and extension strength data were collected using an isokinetic dynamometer (Biodex, USA). Measurements were conducted in the seated-compressed position in line with the manufacturer's guidelines. Following five sub-maximal trials, peak torque was recorded during three maximal flexion and extension trials at two testing speeds (20°/s and 45°/s). Peak torque was then normalised to body mass. Pearson's correlations were performed to investigate relationships between trunk strength and functional mobility measures. The level of significance was set at $p \leq 0.05$.

RESULTS: A number of associations between trunk strength and functional mobility measures were revealed. Greater trunk extension strength was correlated with superior performance in the CST (45°/s: r=0.33, p=0.037), stair ascent (20°/s: r=-0.32, p=0.043; 45°/s: r=-0.56, p=<.001) and stair descent tasks (45°/s: r=-0.47, p=0.002). Trunk extension strength was also associated with GS during normal (20°/s: r=0.37, p=0.019; 45°/s: r=0.48, p=0.004) and fast trials (45°/s: r=0.34, p=0.034). Trunk flexion strength was correlated with TUG (45°/s: r=-0.42, p=0.007), stair ascent (20°/s: r=-0.41, p=0.008; 45°/s: r=-0.47, p=0.002) and stair descent times (20°/s: r=-0.44, p=0.005; 45°/s: r=-0.42, p=0.007). Trunk flexion strength was also associated with normal (20°/s: r=0.55, p=<.001; 45°/s: r=0.56, p=<.001) and fast GS (20°/s: r=0.32, p=0.047; 45°/s: r=0.34, p=0.031).

CONCLUSIONS: These findings suggest that there is a moderate-strong relationship between muscle strength in the trunk area and a range of functional mobility measures in older women. These results have important practical implications which could be used to inform the inclusion of trunk exercises in interventions targeting functional mobility for older adults.

REFERENCES: Granacher et al. Sports Med (2013) 43:627-641; Shahtahmassebi et al. Scientific reports (2017) 7:10907