

Yoga for Prevention of fall

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Community dwelling older adults can be defined as individuals over the age of 65 who reside independently in the community [1,2]. One third of all these individuals fall at least one time per year [1]. A fall is defined as a person's trunk, knee or hand, unintentionally coming to rest on the ground or some level below the waist. Thirty three percent of people over 65 and 49% of the community dwelling elderly over 72 fall [3]. The US Department of Public Health estimates that 2/3 of falls are potentially preventable [4]. Risk factors for falls include (but are not limited to) decreased balance, decreased strength, decreased gait speed and fear of falling [5-8]. The use of therapeutic yoga to prevent falls and reduce the risk of falling in community dwelling older adults has gained popularity. A PubMed search using the key word "yoga" yielded 2,257 studies since 1948. Adding the keyword "falls" narrowed the yield to 10 studies. Of these 10 studies, five did not actually use yoga, one was a systematic review, one used chair yoga and one study was a study of fear of falling, not actual falls. The remaining two are included in the following review along with several additional studies that focus on community dwelling older adults and falls. These studies have examined the efficacy of using yoga to prevent falls and reduce the risk of falling in community dwelling older adults. The following paper will review these studies.

Zettergren et al. [9] conducted a pilot study with 13 participants aged 62–82. A sample of convenience was used from a local continuing care retirement community. Subjects participated in a 60 minute yoga session one hour per week for four weeks. A statistically significant increase on scores of the Balance and Mobility [10] test was found, revealing a reduced risk of falling after four weeks of yoga. Zettergren et al. [11] conducted a similar study.

The authors recruited 8 subjects aged 84 (± 4.6 years) to participate in a therapeutic yoga program and 8 subjects aged 81.3 (± 4.9 years) to serve as controls. Subjects were recruited via advertisements at a local continuing care retirement community. All subjects were volunteers. Subjects in the yoga program participated in bi-weekly, 80 -minute yoga program for 8 weeks. Control subjects received no intervention but were allowed to continue with regular exercise. Paired t-tests revealed improvements in Berg balance scale scores ($t=4.51$, $p<.0003$) and fast gait speed ($t=2.69$, $p<.031$) of yoga participants only. The floor-to-stand transfer also approached significance. Overall, yoga participants reported feeling steadier and less fearful of falling. The authors included both standing and seated asana, which may have contributed to the reduced time in the floor-to stand transfer.

DiBenedetto et al. [12] used a sample of convenience to conduct a study evaluating the effects of yoga on gait speed and hip extension. Although the authors did not directly measure falls or risk of falling, improving gait speed and hip extension ROM reduces the risk of falling [13,14]. The authors recruited 19 subjects aged 62–83 to participate in a 90-minute yoga program, 2X per week X 8 weeks. The authors noted improved hip extension ROM, improved stride length at comfortable walking speed and a non-significant increase in self-selected gait speed. The authors specifically outlined the use of rajakapotasana, parsvotanasana and virabhadrasana to target the pelvic region and improve mobility.

Brown et al. [15] recruited 22 subjects aged 69–90 to participate in

a 12-week yoga program specifically designed for older adults. Using non-parametric statistics, the authors noted that 63.6% of subjects showed improved scores on the Berg Balance scale, 59.1% of subjects improved on the Activities specific Balance Confidence Scale and 68.2% of subjects improved their times on the one-legged standing test. The authors included Vrksasana and Ardha Chandrasana in their program, which may have contributed to both, improved Berg Balance Scale Scores and improves ability to stand on one leg.

Several authors have shown that including specific asana in an overall yoga program for older adults may improve balance [9,11,15], hip ROM [12] and gait speed [11]. Yoga programs designed specifically for older adults should include a combination of sitting and standing asana and modifications such as warming up with heel raises and the use of a chair to reduce the fear of falling during the practice. These programs must be well documented in the literature (and provided in an appendix) when published so clinicians and yoga teachers can plan programs based on systematic data. Programs specifically designed to target the impairments that contribute to falls and the risk of falling appear to reduce both and should be considered a viable alternative to traditional exercise programs when advising older adults. An untapped wealth of data exists regarding the qualitative improvements people experience after yoga, such as greater connection and sense of well-being. More research is needed to cement the need for yoga in the prevention of falling in older adults. This research should include randomized control trials. Control groups should receive a group-based exercise program of equivalent time and length to the yoga programs. Finally, authors should discuss both statistical and clinically meaningful differences found. Statistical differences (or lack there of) often do not highlight important changes noted in performance after intervention. Using measures such as MDD (Minimal Detectable Difference) or MCD (Minimal Clinical Difference) will provide treating therapists with more insight into the efficacy of yoga than statistically significant data alone.

References

1. Brown CJ, Gottschalk M, Van Ness PH, Fortinsky RH, Tinetti ME (2005) Changes in physical therapy providers' use of fall prevention strategies following a multicomponent behavioral change intervention. *Phys Ther* 85: 394-403.
2. 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. *Phys Ther* 7: 46-57.
3. Braun BL (1988) knowledge and perception of fall-related risk factors and fall-reduction techniques among community-dwelling elderly individuals. *Phys Ther* 78: 1262-1276.

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4. Chandler JM, Duncan PW, Sander L, Studenski S (1996) The fear of falling syndrome: relationship to falls, physical performance, and activities of daily living in frail older persons. *Top Geriatr Rehabil* 11: 55-63.
5. Fritz S, Lusardi M (2009) White Paper: "Walking speed: the 6th vital sign". *J Geriatric Phys Ther* 32: 1-5.
6. Friedman SM, Munoz B, West SK, Rubin G, Fried LP (2002) Falls and fear of falling: which comes first? A longitudinal performance model suggests strategies for preliminary and secondary prevention. *J Am Geriatric Soc* 50: 1329-1335.
7. Tinetti M, Speechley M, Ginter S (1988) Risk factors for falls among elderly persons living in the community. *N Engl J Med* 319: 1701-1707.
8. Tinetti M (2003) Preventing falls in elderly persons. *N En J Med* 348: 42-50.
9. Zettergren K, Moriarty E, Zabel A (2006) The Effectiveness of therapeutic yoga on community dwelling older adults with and without balance deficits. *J Neuro PT* 29: 216.
10. Tinetti M (1986) Performance-oriented assessment of mobility problems in elderly patients. *J of AmerGerSoc* 34: 119-126.
11. Zettergren K, Viverito J, Lubeski J (2011) Effects of a yoga program on postural control, mobility, and gait speed in community living older adults: A pilot study. *J Geriatr Phys Ther* 34: 88-94.
12. DiBenedetto M, Innes KE, Taylor AG, Rodeheaver PF, Boxer JA, et al. (2005) Effect of a gentle Iyengar yoga program on gait in the elderly: An Exploratory Study. *Arch Phys Med Rehabil* 86: 1830-1837.
13. Kerrigan DC, Todd MK, Della Croce U, Lipsitz LA, Collins JJ (1998) Biomechanical gait alterations independent of speed in the healthy elderly: evidence for specific limiting impairments. *Arch Phys Med* 79: 317-322.
14. Kerrigan DC, Lee LW, Collins JJ, Riley PO, Lipsitz LA (2001) Reduced hip extension during walking: Healthy elderly and fallers versus young adults. *Arch Phys Med* 82: 26-30.
15. Brown KD, Koziol JA, Lotz M (2008) A yoga based exercise program to reduce the risk of falls in seniors: A pilot and feasibility study. *J Alt Comp Med* 14: 454-457.