

PICO Question: For a community dwelling patient that is 60+ yrs old, and deconditioned with increased fall risk, would a general group exercise class with fall prevention education or a multifactorial intervention approach decrease fall risk more in 6-8wks?

Author/ Year	Design/ Subjects	Intervention or description	Measurements	Outcomes	Comments /limitations/applicable
Wolf SL, 2003	RCT, 311 community dwelling elderly participants,	Intense tai chi 2x/wk 60-90m, over 48wks, control had 1x/wk education and handouts	# of falls, elements of the BERG, functional reach, gait speed, FES, ABC scale, health related QOL(Sickness Impact Profile, and Center for Epidemiologic Studies-Depression Scale) MMSE, MMT, ROM, vitals, sensation, grip strength, injurious falls, death/hospitalizations Taken pre and post	# of falls decreased overall, although there were increased # of falls in the first month, control group also saw a decrease in falls in the regular attenders There was not significant difference between the groups.	Participants were thought to have increases in falling in the first month due to complications learning the forms. It appears that TC will be a better intervention in more active elderly, or with more TC experience.
Taylor D, 2012	RCT, 228 participants were 65 or greater with at least 1 fall within the last year Three groups TC 1x/wk, TC 2x/wk, and exercise class 1x/wk	10-form suns style TC 1hr/session for 20 wks, control group had low level exercises for strength, endurance, and stretching	# of falls, TUG, 30 sec chair stand test, step test taken pre, post, 11mths, and 17mths	There was a reduction in # of falls, but not rate of falls between the groups. TUG showed no significance, step tests showed improvement but not significantly different, chair stand test improved overall but no significant difference.	Their results show long term benefits in fall reduction, as well as longterm adherence of program, but there doesn't seem to be a difference between low-level exercise and TC
Freiberger E, 2012	RCT, 70+ with 1 fall in last year, had a fear of falling, 4 groups- CG no intervention, SBG progressive strength balance, FG progressive strength balance and endurance MG strength, balance, and education	16wks with 2x/wk 1hr/session, discussion time then warmup, 30min of exercises, cool down, then discussion SBG- WBing exercises, obstacle courses, coordination exercises FG- as above plus walking MG- SBG plus "matter of balance program"	TUG, 5x sit to stand, 10mwt, modified rhomberg, # of falls, ABC scale, consequence of falling scale. Taken baseline, 6, 12, 24 mths	FG showed the greatest improvement in performance measures at 24mths, reduction in falls, but there was no significant difference in falls between the groups,	This study had a large drop out rate, mainly in MG group. Also, the MG group only had 1hr to fit all their interventions in so this would support reasoning as to the decreased performance measure scores, they also don't report if participants adhered to the programs
Steinberg M, 2000	RCT, 250 elderly subjects, split into 4 groups Education and fall awareness Strength and balance Home safety advice Medical assessment	1 st - oral presentation on home safety, fall risks, with handout 2 nd - 1 st , plus 1hr exercise/mth, and encouraged to exercise in between classes 3 rd - 1 st and 2 nd , plus home safety eval, and financial aid assistance handout for modifications 4 th - 1 st , 2 nd , and 3 rd plus medical assessment and medical risk factors for falls	Prevalence of slips, trips and falls Taken monthly by self-reported diaries	Falls had 18-40% reduction throughout groups 2,3, and 4. slips and trips were significantly reduced.	All groups have a factor in preventing falls, but I feel that this study should have had a higher number of subjects to increase its accuracy and power. I also feel that they should have added more valid and reliable outcome measures, other than just slips, trips and falls.
Franco MR, 2013	PEDro systematic review, only RCTS and quasi-RCTS were allowed, Participants in trials were considered community dwelling older adults for a total of 79,193 across the studies reviewed, 70% were women	Studies reviewed included interventions of multi-component exercise groups and at home, tai chi, gait, balance, functional training, strength and balance, and general physical activity(walking)	Predominant measures were rate of falls, and # of falls, # of fractures was also recorded in a majority of the studies	Multi-component programs showed the greatest benefit of reduction in falls and rate of falls at p=.86. TC and regular exercising had lesser though significant effects. Fracture rate also decreased with exercise groups	They make a point to say that TC seems to have better results in lower risk populations. Multicomponent programs seem to be the best way to decrease falls and risk of falls.

Barnett, A. et al 2003	RCT/ 163 subjects, 65+ yrs old, 83 in intervention group, 80 in control	Intervention: 1hr group exercise session with a median 23 sessions per subject, exercises included warmup stretch, balance, strength, coordination, and aerobic capacity. Taught by 3 similarly trained instructors. also told strategies of how to avoid falls. HEP.	3 blind assessors, used knee ext. strength, Simple reaction test, swaying on foam eyes open/closed, leaning balance, Berg alternate step-up, sit-to-stand, and walking speed. SF-36, PASE reported activity level. assessed at baseline, 6months and recorded falls for 12 months.	There was a 40% reduction in the risks of falls, and a 34% reduction in injurious falls compared to the control group.	they focused mainly on balance exercises, and kept the intensity low. There could have been more intensity to try to gain strength. They aren't able to single out which factor worked the best, but it is an effective cost effective program to implement that can be related to any population.
Miller, K.L. et al 2010	A pilot study, quasi-experimental single group pre-to posttest. 14 recently home bound subjects, 9 male, 5 female between the ages 71-85.	home based standing exercise and balance training program performed twice daily for about 1 hour each. exercises included: 4 standing exercises(partial squats, heel raises, hip abd, and flexion), and 6 balance exercises(side stepping, tandem walking, retro-walking, crossovers, SLS, and standing pertubation). Family was trained by PT to assist. They were taught safety awareness.	Falls Efficacy Scale, Performance Oriented Mobility Assessment, One-leg stance test. Measured at baseline and at the end of 4 week program.	Wilcoxon signed rank test and the 2 tailed paired t-test had statically significant improvements. They reported feeling more confident in balance and they were able to become more active outside the house.	The exercises used are commonly used in clinics now, and would be easy to implement. Small size but other research suggests the same results. There was nothing said of subject verifying that they complied with protocol. Also family members could affect outcome depending on their desire to see them get better or not.
Halvarsson, A. et al 2010	Prospective RCT 59 >65 yr old subjects recruited by advertisement, randomly assigned intervention n=38, control=21	Individually adjusted, progressive and specific balance group training given 3x45 min/wk for 3 months. Exercises focused on ADLs, and incorporating loss of balance during dual or multiple tasks. Typical exercises were given but incorporated counting, repeating words, reading newspaper, buttoning shirt, carrying trays of glasses. Each exercise was adjusted individually by changes in support area, arm position, head movements, and speed of movement.	Reaction time for a rapid step forward was measured with a step execution test during single and dual tasks. Force plates measured the data. A Falls Efficacy Scale-international screened fear of falling. Gait was measured with GAITRite.	At three months the intervention group showed significant positive changes in the FES-I, the step-execution phase of dual task performance, and in gait at preferred and fast speed with cadence. The likelihood of depression also decreased.	This study seemed to cover many of the limitations that other studies had. Some of which were the incorporation of individualized exercises, and dual/multiple task oriented exercises. They focused mainly on balance and reaction tests and had positive outcomes. This kind of balance program seems to work well at decreasing falls because of it's specificity to everyday living.
Nitz, J.C. et al 2004	Pilot RCT 73 males and females, age >60. recruited by newspaper ads, fliers in clinics/recreation centers. Inclusion consisted of a recent fall, excluded if they hadn't fallen or unstable cardiac condition. 37 intervention group, and 36 in control.	Fall reduction booklet, 1hr/sessions 1x/wk 10wks intervention group, split into workstations of Exercises including: sit-to-stand, stepping in all directions, reaching to limits, step ups, balance strategy practice, sideways reach task, ball games with cognitive tasks, treasure hunts to promote irregular positions. Control received 10 standard PT sessions with common balance and strengthening exercises.	FES, Clinical Outcomes Variable Scale, reach tests, step tests, TUG. Other tests were software based Neurocom Balance Master, and the Sensory Integration of Balance.	Overall both groups got better, but the balance group did better. The results power level was reduced due to drop outs from deaths, serious illness, and inability to get to clinic. FES had improvement for both groups with the balance group more so. Balance group also had significant improvements in reach and step tests, over the control group.	I like the idea of workstations, makes it sound fun, especially the treasure hunt idea, very creative. The stations incorporated reaction practice, balance, strength, flexibility, and endurance. Conditioning is something I haven't thought of when relating it to balance. Limitations were the drop outs affecting what they said would have been better results had they not happened.
Li et al 2005	RCT 2 armed parallel intervention group. Participants recruited from health system in Oregon. 256, b/w 70-92 Inclusion: >70 inactive, independent ambulator, able to perform mod-intensity exercise, no cognitive impairments.	6 month 3/week. Intervention: Yang style tai chi, which emphasizes weight shifting, body alignment awareness, multisegment movement, and breathing control. 5-10 warm ups and cool down. Stretch group: idea was to get to get the same social interaction, low intensity stretches with same format.	Measurements were taken at baseline 3&6 months. Fall counts were recorded, and classified on severity. Other tests BBS, dynamic gait index, functional reach, 50-foot speed walk, TUG, SAFFE. Intention to treat analysis, ANOVA, chi-square and Fisher's exact test.	At 6 months, Tai chi showed significant increases in performance tests as well as reduced falls and injurious falls. The risk of multiple falls was also 55% lower.	This study was well done, very detailed. Tai chi seems to be a great intervention that promotes social interaction, as well as confidence all the reducing falls and the risks of injurious falls needing medical care. This provides evidence that fall prevention interventions can reduce medical costs.

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Soon to be added References

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