

Implementing an Evidence-Based Fall Prevention Intervention in Community Senior Centers

Take Away Points

- It is feasible to implement the Tai Ji Quan: Moving for Better Balance (TJQMBB) fall prevention program in community senior centers
- TJQMBB is a safe and cost-effective program to reduce and, potentially, prevent falls in older community-dwelling adults
- Additional physical benefits of TJQMBB include improved functional reach and measures of time of chair to stand, 50-foot speed walk, and timed Up & Go

The Issue

Exercise interventions reduce the risk and incidence of falls. However, the majority of studies evaluating exercise have been efficacy studies (i.e., randomized controlled trials) versus effectiveness studies targeting older adults in their communities. The current study builds on previous work that shows the feasibility of the Tai Ji Quan: Moving for Better Balance (TJQMBB) program. The overall objective of this study was to assess the implementation of TJQMBB in community senior centers. The primary aim was to evaluate the program's adoption and reach with a secondary aim that focused on the effectiveness and maintenance of the program's implementation. The third, and final, aim was to assess the cost-effectiveness in senior center settings.

Source

Li F, Harmer P, Fitzgerald K. Implementing an evidence-based fall prevention intervention in community senior centers. *AJPH*. 2016, 106(11): 2026-2031.

<http://ajph.aphapublications.org.ezproxy.uky.edu/doi/pdf/10.2105/AJPH.2016.303386>

Study Methods and Design

This study used a single-group, active intervention and post-intervention follow-up design. The intervention duration was 48 weeks and program maintenance was evaluated at a 6-month post-intervention follow-up. Thirty-six community senior centers from 4 Oregon counties were approached to be part of this study from 2012-2016. Individual participants eligible for TJQMBB were at least 65 years old, physically mobile (i.e., could walk 1 or 2 blocks without an assistive device), had no severe cognitive deficits as defined by the Mini-Mental State Examination (score ≥ 19) and able to obtain medical clearance from a health care provider.

TJQMBB was delivered in group sessions with 3 main components: (1) 5-10 minutes of preparatory exercises based on tai ji quan movements, (2) 40-45 minutes of teaching and practicing a set of 8 single forms constituting the core routine along with a set of therapeutic movements, and (3) 3-5 minutes of simple breathing exercises. There were also chair supported progressions from completely seated to sit-and-stand to chair assisted. Four to six weeks into the program participants were provided with a DVD showing samples of the program's forms and movements and were encouraged to use the DVD for 15 minutes each day.

Evaluation procedures were developed using the Reach, Evaluation, Adoption, Implementation, Maintenance (RE-AIM) public health model. Descriptive statistics were used as means and standard deviations or percentages for demographic and study outcome measures. Fall incidence rate over the

48-week intervention and estimated change and annual rate of change using a latent growth curve modeling approach on repeated measures of physical performance outcomes at midpoint (24 weeks) and completing (48 weeks) was used to determine the program's effectiveness. Further analysis was conducted to account for nonindependence of observations due to cluster sampling. Given the single-group design, an average cost-effectiveness method was used to derive a cost-effectiveness ratio on the outcome of interest (i.e., cost per fall prevented).

Key Findings

- Excluding dropouts, the average number of classes attended was 73 sessions (SD=1.5; median=77; range=21-96) with 66% of participants attending more than 75% of the 96 intervention sessions.
- Of the 413 participants who completed an exit survey 94% enjoyed the program and felt that the exercises helped their balance (93%), leg strength (81%), and mobility (84%).
- Of the 263 participants who reported at least 1 fall at baseline, 141 (54%) reported no falls during the 12-month intervention period.
- At the end of the intervention there were 327 fewer falls than at baseline (n=672) resulting in a 49% reduction in the number of falls.
- Latent slope means indicated a significant change in all outcomes at each 6-month interval with estimated reduction rates of:
 - 0.13 seconds for the timed Up & Go
 - 0.10 seconds for chair stand
 - 0.14 seconds for 50-foot speed walk
- There was an increase in functional reach of 0.09 inches at each 6-month interval
- During the 6-month post-intervention follow-up, 55% of centers continued to offer TJQBMM program and 65% of participants continued to practice tai ji quan (68% in class and 32% on their own)
- The cost-effectiveness of the 48-week TJQBMM program was \$917 per fall prevented and \$676 per fall prevented for those who reported multiple falls at baseline

Limitations

- The intervention was limited to a single state where tai ji quan is relatively well known and the program has been well-received in communities
- There was no comparison group and thus causality cannot be assumed.
- The robustness of the cost-effectiveness needs to be evaluated through more rigorously designed trials

Final Thoughts

The 48-week TJQBMM program is a low-cost fall prevention program that allows older adults to “age in place”. Along with fall reduction and prevention, the TJQBMM program improved functional reach and time of chair to stand, 50-foot speed walk, and timed Up & Go indicating that participants may receive additional physical benefits that can have positive long-term health implications. Though further research is needed in a variety of community-based aging services, the current study shows that community senior centers is an appropriate setting for this type of program.