The Bottom Line is a translation of study findings for application to clinical practice. It is not intended to substitute for a critical reading of the research article. Summaries are written by members of The Bottom Line Committee.


What problems did the researchers set out to study, and why?
Tai chi is believed to be an effective exercise intervention for improving muscle strength, postural control, cardiorespiratory function, and spinal flexibility. Moreover, tai chi has been recently recognized as a potentially effective approach to fall prevention in elderly people. Most of the available evidence regarding its efficacy, however, has come from Western societies in which tai chi is a novel approach to exercise. Although tai chi interventions have been reported to improve balance and reduce fall-related psychological trauma in older adults, its effectiveness for reducing injurious falls remains unclear. These researchers sought an answer to that question and also sought to determine the effects of adherence to a community-based tai chi program on both falls and related functional outcomes, including balance, gait, and fear of falling.

Who participated in the study?
In this population-based study, 1,200 subjects aged 65 years and older were enrolled from 6 villages in Shin-Sher, a rural township located in west central Taiwan. Four villages were designated “control villages,” from which 728 people were enrolled. Two villages were designated “tai chi villages,” from which 472 people were enrolled. Out of the 1,200 subjects, 88 participated in an active tai chi intervention and were designated “tai chi practitioners.” All subjects received an educational program.

What new information does this study offer?
Although an overall reduction in the incidence of injurious falls was observed, this reduction occurred in all participants without statistically significant differences among the 3 groups. It is not possible, therefore, to conclude that participation in a tai chi intervention is effective at reducing injurious falls. Consistent with results from previous studies, the tai chi practitioners demonstrated significant improvements on the Tinetti Balance Scale and Tinetti Gait Scale; however, no significant differences in fear of falling were revealed among the 3 groups.

The unexpected result of this study was the marked decrease in injurious falls in the control villages. One interpretation of this finding is that the educational program was more effective than anticipated. However, because previous research has shown that education on fall prevention is not effective, the researchers attributed this finding to either a Hawthorne effect or to the regular follow-up telephone contacts, which may have served the role of a co-intervention (ie, encouraging subjects to avoid situations that might place them at high risk for falls).

How did the researchers go about their study?
This study was conducted over a 2-year period. Subjects were identified on the basis of census records and were contacted by telephone every 3 months. During the first year of the study, all subjects were interviewed to assess their exercise types and patterns, frequency of exercise in the 2 weeks prior to the interview, fall history, comorbidities, and independence in activities of daily living. During the second year of the study, all subjects in both the tai chi and control villages received an educational program regarding fall prevention, exercises, walking aids, and environmental improvements, such as lighting stairways, using nonskid mats, and keeping objects and cords off the floor. In addition, the tai chi practitioners participated in an active tai chi program lasting 1 hour, 6 days per week.

How might the results of this study apply to patients who are treated by physical therapists from this point forward?
It is noteworthy that, for purposes of this study, the definition of falls was narrowly defined as injurious falls, rather than more broadly defined to include all falls. In this light, education on fall prevention may indeed have a significant, positive effect on certain older populations. Recommendations for safety consciousness were posted publicly, and depictions and

recommendations in pamphlets were clearly and attractively illustrated and simply stated.

As the authors note, members of rural communities tend to be more open to and willing to implement prevention programs. Many of the subjects in this study were farmers and were motivated to avoid injurious falls.

What are the limitations of this study, and what further research is needed?
Some baseline differences were present between subjects in the control villages and those in the tai chi villages, and these differences may have contributed to the marked reduction in injurious falls in the control villages. Furthermore, the narrow definition of falls in this study may have limited the ability to detect differences of the target intervention. Finally, although previous studies have demonstrated that tai chi exercise seems to be more effective for reducing falls in elderly people, these findings are relevant to elderly people who are healthy and include a broader definition of both injurious and noninjurious falls. The combination of the subject characteristics and the study’s operational definitions may have limited the potential to detect differences resulting from the intervention. In addition, the secondary outcome measures for balance, gait, and fear of falling were not sensitive enough to detect differences among the study groups.

Two general issues remain for future study. First, it would be worthy to determine whether an easily understood educational program on fall prevention is effective in reducing the incidence of serious falls in community-dwelling elderly people. Second, it is likely that the tai chi program benefited not only the physical function but the social health of older adults, so the use of multidimensional outcome measures, including health-related quality of life, should be included in future studies.