Long-term Tai Chi practitioners have superior visuospatial ability and postural stability during standing with upper body movements

Zhufeng Shao, Qipeng Song

Shandong Sport University, Jinan 250000

Abstract: Objective: Falls is directly related to the visuospatial ability and postural stability, the perturbation of upper body motion is challenging for older adults to cause falls. This study was to explore the effects of long-term Tai Chi (TC) practice on visuospatial ability and postural stability among older adults during standing with upper body movements. **Methods:** Thirty-seven TC and no-exercise (NE) practitioners aged from 65 to 77 years were recruited from local communities. Touch task (TT) and blind touch task (BTT) were performed in an fixed order. The target positioning error, time to stabilization (TTS) and center of pressure (COP)-related variables during the task were recorded and compared. **Result:** Under both TT and BTT conditions, TC practitioners had less target positioning error in up-down (UD) direction ($p = 0.005$) and in 3-dimensional space ($p = 0.003$), shorter time to stabilization (TTS) in anterior-posterior (AP) ($p = 0.001$, $\eta^2_p = 0.458$) and mediolateral (ML) directions ($p<0.001$, $\eta^2_p = 0.557$), smaller 95% confidence ellipse area (Area) ($p < 0.001$, $\eta^2_p = 0.757$), maximum distance (D_{max}) in AP ($p = 0.025$, $\eta^2_p = 0.263$) and ML ($p = 0.014$, $\eta^2_p = 0.304$) directions, root mean square (RMS) in AP ($p = 0.02$, $\eta^2_p = 0.280$) and ML ($p < 0.001$, $\eta^2_p = 0.718$) directions, compared to NE practitioners. **Conclusion:** Long-term TC practitioners have superior visuospatial stability and postural stability, indicated that long-term TC practice could decrease the fall risks among older adults.

Key words: Tai Ji Quan, Coordination, Postural balance