Effect of seated Tai Chi on physical functioning among individuals with stroke: Pilot Study

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Purpose

• To test effect of Tai Chi applied stroke rehabilitation program on physical functioning (balance, mobility, flexibility, upper arm strength), activity of daily living, and self-efficacy in individuals with stroke
## Methods

- **Study design:** One-group pre-posttest experimental design

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• Subjects: 10 stroke patients with hemiplegia who are registered as a disabled person at the community service center
Intervention

• Modified Seated Tai Chi program
• Content: Seated tai chi (12 movements) plus Qi Gong, Stretching with meditation music
• Duration/Frequency : 2 sessions per week, 40~60 minutes per session for 48 weeks
• Teaching method: progressive practice in a block unit; using visualization
• Exercise: while being seated or standing
Measurement

• Physical functioning

1) **Upper arm strength**: grip strength

2) **Flexibility**: standard sit-and-reach test

3) **Mobility**: Timed Up and Go Test for 6 meters
4) Balance: Berg balance scale – the gold standard to measure functional balance test

- 15–20 minutes and comprises a set of 14 simple balance related tasks, ranging from standing up from a sitting position, to standing on one foot

- Reliability: excellent inter-rater (ICC = 0.98) and intra-rater relative reliability (ICC = 0.97),
Self-efficacy

- 17-item self-efficacy scale for hemiplegia patients (developed by Lee, 1998 and modified by Choi, 2002)
- 4-point Likert scale
- Cronbach's $\alpha = 0.93$
Activity of Daily Living

- Korean version of Modified Barthel Index (K-MBI) (Jung et al., 2007)
- 10 items: bladder, bowel, grooming, bathing, feeding, toilet use, dressing, stairs, transfer, and mobility
Procedure

• Approval from IRB
• Recruit subjects from community service center
• Explained study purpose and methods and obtained informed consent
• Provided 48-week program by Tai Chi certified instructor
• Study outcomes are measured at pretest and 4 times (12 weeks  24 weeks  36 weeks  48 weeks)
Data Analysis

• Using SPSS WIN version 21.0
• Descriptive statistics for subjects’ characteristics and outcome variables
• Paired t-test for program effects at pretest versus posttest outcomes
• Repeated measures of ANOVA
Results

• Age: 61-70 years (n=5), 71 or older (n=5) mean age: 72.2(9.3)
• Gender: 4 males and 6 females
• 70% living with spouse/family, 30% living alone
• Duration of stroke: 3 months or less: n=5, 3-6 months n=3, 6-12 months n=2
Results

Balance

• Significant improvement from pretest to T2, T3, T4 posttest (paired t-test)
• Not significant from RM ANOVA
Results

Mobility

- No significant improvement from pretest to 4 posttest (paired t-test)
- No significant from RM ANOVA
Timed up and go

[Line chart showing performance over time for different groups labeled A to J.]

pre(M)  3m(M)  6m(M)  9m(M)  12m(M)
Results

Muscle strength (Lt arm)
• No significant improvement from pretest to 4 posttest (paired t-test)
• Not significant from RM ANOVA
Grip strength (Left)
Results

Muscle strength (Rt arm)
• No significant improvement from pretest to 4 posttest (paired t-test)
• Not significant from RM ANOVA
Grip strength (Right)
Results

**Flexibility**
- No significant improvement from pretest to 4 posttest (paired t-test)
- Not significant from RM ANOVA
Flexibility
Results

Activity of daily living
• Not significant improvement from pretest to all posttest
• Not significant from RM ANOVA
Activity of daily living
Results

Self-efficacy
- Significant improvement from pretest to all 4 posttests (p < .05)
- Not significant from RM ANOVA
Conclusion

• Tai Chi can be safely applied to rehabilitation program for individuals with stroke for one year.

• Physically disabled individuals can perform Tai Chi for long term and improved their balance significantly.

• Tai Chi, as a mind-body exercise, can be useful to improve physical function and activities of daily living, consequently leading to the improved quality of life for this population.
Further studies

• Symptom clusters of stroke patients are intercorrelated, therefore further studies is warranted to examine the effect of Tai Chi applied stroke rehabilitation on various symptom clusters.

• Cognitive function may be correlated with movement control, therefore Tai Chi exercise may have positive effect on cognitive function in this population.
Let’s practice

✓ Tai Chi greeting
✓ Tai Chi walking forward, backward, sidesteps
✓ Commencement
✓ Open and close movement
✓ Waving hands in the cloud
✓ Closing