The Effects of Cognitive Training on Healthy Elderly Thais: Randomized Controlled Trial

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Objective: The main purpose was to evaluate the effects of restorative strategic cognitive training intervention (CTI), involving low-technology devices in healthy elderly Thais in community-based populations.

Methods: This study was a two-arm parallel single-blinded randomized controlled intervention trial. Eighty-six qualified participants aged at least 55 years old were recruited from an elderly club in Bangkok suburbs. The exercises in the CTI combined with complex attention, executive function, learning and memory, language, visuospatial ability, and social cognition. The CTI was run by an audio-visual digital video disk which explained instruction and demonstration in each lesson and involved an individual paper-pencil workbook. The CTI was implemented twice per week with 30 minutes allocated to each session during 12 weeks.

Outcome	CTI Group (n=44) Trend of Mean change	Wait-list Group (n=42) Trend of Mean change	Mean Difference between Group (CTI – WC)
Global cognitive function			
ΔTMSE at T1-T0	↑	↓	0.57* (0.07, 1.08)
ΔTMSE at T2-T0	↑	↓	0.33 (-0.23, 0.88)
Attention-concentration			
ΔDSF at T1-T0	↑	↓	0.69 (-0.18, 1.56)
ΔDSF at T2-T0	↑	↑	0.32 (-0.52, 1.15)
Psychomotor speed			
ΔTMT-A time at T1-T0	↑	↑	-1.47 (-7.94, 5.00)
ΔTMT-A time at T2-T0	↑	↑	-0.46 (-0.76, 6.77)
Executive function			
ΔTMT-B time at T1-T0	↑	↓	-15.89 (-41.18, 9.39)
ΔTMT-B time at T2-T0	↑	↑	-12.06 (-33.77, 9.65)
Visuospatial ability			
ΔConstructional praxis at T1-T0	↑	↑	0.05 (0.14, 0.23)
ΔConstructional praxis at T2-T0	↑	↑	-0.02 (-0.23, 0.19)
Delayed recall memory			
ΔWord Recall at T1-T0	↑	↓	0.32 (-0.21, 0.86)
ΔWord Recall at T2-T0	↑	↑	0.43 (-0.34, 1.19)
Language fluency			
ΔLetter “S” at T1-T0	↑	↓	0.50 (-1.08, 2.08)
ΔLetter “S” at T2-T0	↑	↓	0.78 (-0.91, 2.47)
Depression			
ΔTGDS-15 at T1-T0	↑	↑	-0.07 (-0.74, 0.61)
ΔTGDS-15 at T2-T0	↑	↑	0.08 (-0.58, 0.74)
Quality of Life			
ΔOPQOL-Brief-Th at T1-T0	↓	↑	0.69 (-1.34, 2.72)
ΔOPQOL-Brief-Th at T2-T0	↓	↓	1.14 (-9.99, 3.27)

↑ = improve; ↓ = worsen; TMSE, Thai Mental Status Examination; DSF, Digit span forward; TMT-A, Trail making A test; TMT-B, Trail making B test; TGDS-15, Thai Geriatric Depression Scale-15; OPQOL-Brief-Th, Thai version of Older People’s Quality of Life-Brief; T0, at baseline; T1, at 12th week; T2, at 24th week, *p = 0.026

Results: The average age of the CTI group was 66.6±5.5 years old while that of the wait-list group was 67.5±6.4 years old. At the baseline (T0), the TMSE scores of CTI and wait-list groups were similar (28.8±1.3 and 28.8±1.1, respectively). All participants possessed a good quality of life with no depressive disorder. For the CTI group, the average number of cognitive training visits was 14.8±7.6. At the primary endpoint, the statistical mean difference of TMSE was identified between CTI and wait-list groups by using intention-to-treat analysis (ΔTMSE_{between group at T1-T0} = 0.57; 95%CI = 0.07 to 1.08). At the secondary endpoint, no significant difference of TMSE was found between the two groups (ΔTMSE_{between group at T2-T0} = 0.33; 95%CI = -0.23 to 0.88). Additionally, at both endpoints, the two groups presented no notable discrepancy in six cognitive function subdomains, depression, and quality if life.

Conclusion: CTI posed notable treatment effects (effect size; d=0.56) on the improvement of global cognitive function in healthy elderly Thais but did not demonstrate carryover effects.