

Impact of Tablet-Computer based Cognitive Therapy on Caregiver Burden in Brain Injury Patients

¹Jee Hyun Suh, MD, PhD, ²Yuji Han, MD

¹Department of Rehabilitation Medicine, Seoul National University Bundang Hospital

²Department of Rehabilitation Medicine, Ewha Womans University Mokdong Hospital

Objective

- **Acquired brain injury (ABI)**
 - leads to significant disability and caregiver burden, with high levels of anxiety and depression in caregivers
- **Aim of this study:** to investigate the effects of a tablet-based cognitive therapy program on depression, anxiety, and quality of life in caregivers of ABI patients

Methods

- The study enrolled caregivers of ABI patients at a tertiary hospital from August 2024 to December 2024
- **Inclusion criteria**
 - the primary caregiver of an adult ABI patient
 - ≥ 18 years of age
 - having no significant mental or cognitive impairments
- Caregivers completed questionnaires to assess their quality of life, depression, and anxiety at baseline and after two weeks of participation in a tablet-based cognitive therapy program (Mind Rx)
- **Statistical analysis**
 - using the Wilcoxon signed-rank and Mann-Whitney U tests

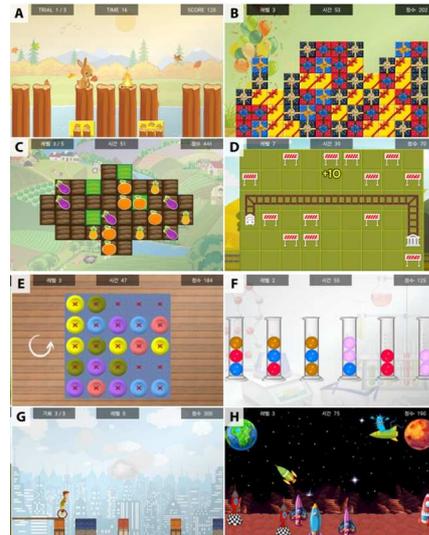


Figure 1. The leaflet provided to the leaflet group in this study

Results

| Variables | All (N=10) | Cognitive treatment group (N=4) | Control group (N=6) |
|---|------------------|---------------------------------|---------------------|
| Caregiver's age (years)* | 50.60±15.95 3 | 65.75±5.56 | 40.50±11.55 |
| Caregiver's sex (Male: Female) | 2:8 | 1:3 | 1:5 |
| Patient's age (years) | 57.90±15.808 | 56.50±23.90 | 58.83±10.23 |
| Patient's sex (Male: Female) | 8:2 | 3:1 | 5:1 |
| Diagnosis | | | |
| Infarction | 2 | 0 | 2 |
| Hemorrhage | 3 | 2 | 1 |
| Hypoxic brain injury | 2 | 1 | 1 |
| Traumatic brain injury | 2 | 1 | 1 |
| Encephalitis | 1 | 0 | 1 |
| Duration since onset (month) | 3.04±5.81 | 0.71±0.49 | 4.59±7.31 |
| Patient's initial MBI | 15.70±16.10 | 18.50±14.39 | 13.83±18.23 |
| Patient's initial MRC sum scale | 31.70±16.95 | 44.25±8.88 | 23.33±16.12 |
| Patient's initial MMSE | 13.10±13.03 | 15.25±11.76 | 11.67±14.72 |
| Caregiver's initial PF of SF 36 | 92.50±16.20 | 86.25±24.28 | 96.67±8.17 |
| Caregiver's initial RP of SF 36 | 88.13±31.52 | 100.00±0.00 | 80.21±40.00 |
| Caregiver's initial BP of SF 36 | 71.75±30.09 | 72.60±36.69 | 71.25±28.67 |
| Caregiver's initial GH of SF 36 | 73.00±24.63 | 82.50±11.90 | 66.67±29.78 |
| Caregiver's initial VT of SF 36 | 63.13±25.59 | 73.44±24.14 | 56.25±26.22 |
| Caregiver's initial SF of SF 36 | 57.50±31.29 | 78.13±25.77 | 43.75±28.23 |
| Caregiver's initial RE of SF 36 | 66.67±47.14 | 75.00±50.00 | 61.11±49.07 |
| Caregiver's initial MH of SF 36 | 65.00±26.56 | 81.25±25.94 | 54.17±22.67 |
| Caregiver's initial PCS of SF 36 | 81.34±20.05 | 85.31±16.13 | 78.70±23.37 |
| Caregiver's initial MCS of SF 36 | 63.07±26.74 | 76.95±15.98 | 53.82±29.65 |
| Caregiver's initial Beck depression inventory | 11.30±10.85 | 4.50±3.00 | 15.83±12.040 |
| Caregiver's initial Beck anxiety inventory | 8.70±11.03 | 2.75±2.63 | 12.67±12.96 |

Table 1. Demographic data of the participants

- **Ten** caregivers participated in the study
- After two weeks, the cognitive treatment group showed improvements in both physical and mental components of quality of life, as measured by the SF-36, compared to the control group : **not statistically significant**
- No significant differences in depression (BDI) or anxiety (BAI) scores between the two groups

Table 2. Comparison of Improvement in Quality of Life, Anxiety, and Depression Between the Cognitive Treatment Group and the Control Group

| Variables | All (N=10) | Cognitive treatment group (N=4) | Control group (N=6) | p-value |
|--|--------------|---------------------------------|---------------------|---------|
| △Caregiver's PF of SF 36 | 1.50±19.59 | 12.50±25.33 | -5.84±12.01 | 0.257 |
| △Caregiver's RP of SF 36 | -14.37±35.85 | -6.25±12.50 | -19.79±46.17 | 0.914 |
| △Caregiver's BP of SF 36 | 3.00±31.90 | 21.87±37.38 | -9.58±22.77 | 0.114 |
| △Caregiver's GH of SF 36 | 1.00±12.20 | 3.75±11.09 | -0.83±13.57 | 0.352 |
| △Caregiver's VT of SF 36 | -6.25±13.18 | 1.56±3.13 | -11.46±15.01 | 0.114 |
| △Caregiver's SF of SF 36 | 10.00±16.46 | 9.37±18.75 | 10.42±16.61 | 0.914 |
| △Caregiver's RE of SF 36 | -3.33±48.30 | 16.67±57.73 | -16.67±40.82 | 0.610 |
| △Caregiver's MH of SF 36 | -2.00±13.37 | 2.50±2.89 | -5.00±17.03 | 0.171 |
| △Caregiver's PCS of SF 36 | -2.22±20.03 | 7.97±19.31 | -9.01±18.97 | 0.171 |
| △Caregiver's MCS of SF 36 | -2.52±17.59 | 7.53±18.14 | -10.56±13.80 | 0.190 |
| △Caregiver's Beck depression inventory | -0.60±4.25 | -1.75±5.50 | 0.17±3.54 | 0.610 |
| △Caregiver's Beck anxiety inventory | -1.40±2.72 | -1.25±2.63 | -1.50±3.02 | 0.914 |

Values are mean \pm SD. PF: physical functioning, RP: role limitations due to physical health, BP: bodily pain, GH: general health perceptions, VT: vitality, SF: social functioning, RE: role limitations due to emotional problems, MH: mental health, PCS: Physical Component Summary, MCS: Mental Component Summary.

Conclusion

- A 2-week tablet-based cognitive therapy program
- showed trends toward improving quality of life and preventing worsening depression in caregivers, though results **were not statistically significant**
- Future studies should focus on longer intervention periods and cognitive training programs tailored to address both cognitive enhancement and therapeutic techniques for managing depression and anxiety in caregivers