P-18

Usability of Tablet-Based Cognitive Training in Patients with Stroke and Traumatic Brain Injury

국민건강보험 일산병원
National Health Insurance Service Ilsan Hospital

Jae hyun Kim, Min A Kim, Hoo Young Lee, Jong Bum Park. Myeong hwan Bang

Department of Physical Medicine and Rehabilitation, National Health Insurance Service Ilsan Hospital

Objective

This study aimed to evaluate the usability levels of tablet-based cognitive training in patients with stroke and traumatic brain injury(TBI) in a real-world clinical setting and also explore patient-related factors associated with training usability.

Materials and Methods

This single-center cross-sectional study evaluated the usability of tablet-based cognitive training in 50 patients with stroke or TBI, recruited between July and November 2025 using a single-visit protocol. Participants completed 30 minutes of training with the tablet-based program Zenicog® (Mindhub, South Korea), targeting three cognitive domains: attention, memory, and executive function. Usability was assessed through direct observation and classified as independent use, assisted use, or unable to use even with assistance. Baseline demographics were collected, and cognitive function (K-MMSE-2) and digital literacy were evaluated to identify factors associated with usability. Digital literacy was assessed using a study-specific questionnaire developed based on prior with pilot testing and expert review ensuring its clarity and clinical relevance. Statistical analyses, including ordinal logistic regression, were conducted to identify patient-related factor of usability.

Results

A total of 50 patients completed the study, with a mean age of 66.6 years. Overall usability of tablet-based cognitive training was categorized as independent use in 40.0% of participants, assisted use in 42.0%, and unable to use in 18.0%.(Table 1.) Significant differences among usability groups were observed for age, sex, education level, prior experience with computer cognitive training, K-MMSE-2, and digital literacy score(all $p < 0.05$). In post hoc analyses, age and digital literacy differed significantly between the independent and assisted use groups, whereas K-MMSE-2 showed significant differences across all three groups.(Figure 1.) In multivariable ordinal logistic regression, K-MMSE-2 was the only significant predictor of usability (estimate coefficient 0.259, 95% CI 0.117-0.402, $p < 0.001$), indicating that higher cognitive function was associated with greater usability.(Table 2.)

Table 1. Usability of tablet-based cognitive training

	Attention	Memory	Executive	Overall
Independent Use	21(42.0%)	20(40.0%)	19(38.0%)	20(40.0%)
Assisted Use	25(50.0%)	21(42.0%)	28(56.0%)	21(42.0%)
Unable to Use	4(8.0%)	9(18.0%)	3(6.0%)	9(18.0%)
Total number(%)	50(100.0%)	50(100.0%)	50(100.0%)	50(100.0%)

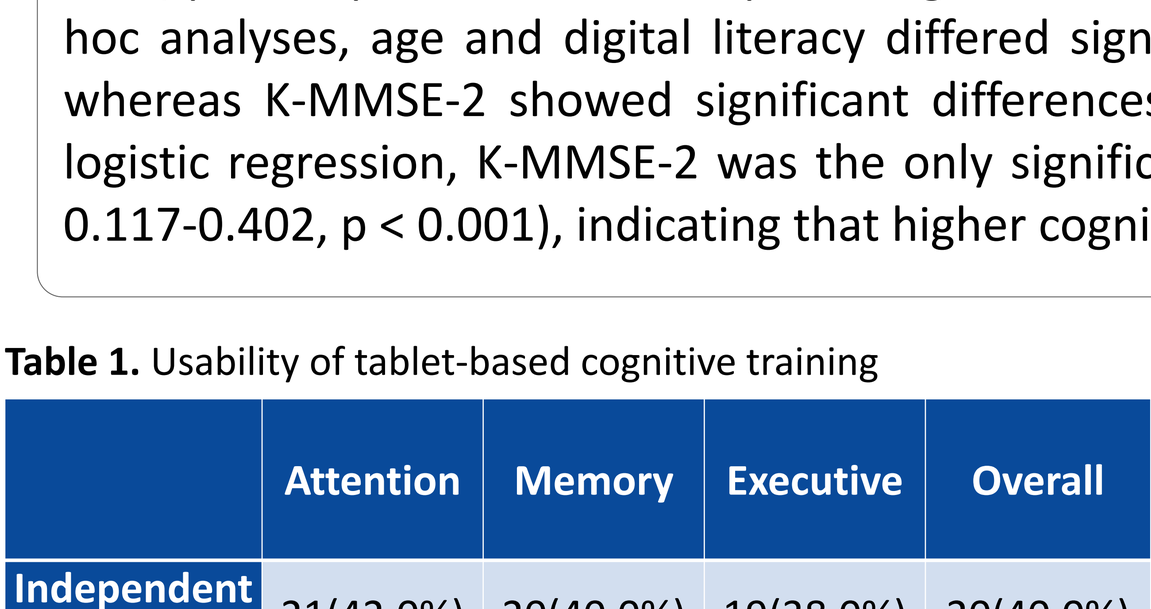

Figure 1. Post hoc comparisons of (A) age, (B) K-MMSE-2, and (C) digital literacy score across usability groups

Table 2. Factors associated with the usability of tablet-based cognitive training

Variable	Categories	Estimate	Standard error	95% CI (Estimate)	Odds Ratio	P-value
Age(years)		-0.047	0.047	-0.140~0.046	0.954	0.320
Sex	Male	1				
	Female	-0.765	0.955	-2.637~1.107	0.465	0.423
Injury type	Cerebral Infarction	0.212	1.320	-2.376~2.800	0.212	0.872
	Cerebral Hemorrhage	0.842	1.371	-1.846~3.529	2.321	0.539
	Traumatic brain injury	1				
Onset duration	Chronic	-0.692	0.973	-2.598~1.214	0.501	0.477
	Subacute	1				
Educational level	College degree or higher	0.744	1.327	-1.857~3.345	2.104	0.575
	Middle or high school graduate	1.915	1.406	-0.841~4.671	6.787	0.173
	Elementary school or below	1				
Aphasia	Yes	-0.360	0.947	-2.216~1.495	0.698	0.704
	No	1				
Visuospatial neglect	Yes	-1.308	1.300	-3.856~1.240	0.270	0.314
	No	1				
Computer cognitive training experience	Yes	0.536	1.103	-1.625~2.697	1.709	0.627
	No	1				
K-MMSE-2	Mean(SD)	0.259	0.072	0.117~0.402	1.296	<0.001*
Digital Literacy Score	Mean(SD)	0.022	0.067	-0.109~0.154	1.022	0.737

Conclusion

The majority of patients with stroke or TBI were able to use tablet-based cognitive training either independently or with assistance. These findings suggest that tablet-based cognitive training may be a feasible and practical option for a substantial proportion of patients with brain injury. Importantly, this highlight the need for individualized rehabilitation strategies tailored to patients' cognitive function and clinical characteristics. Furthermore, the results indicate that simple cognitive screening may help predict the usability of tablet-based cognitive training in advance, providing a basis for more efficient allocation of limited clinical resources.