

Effect of Cognitive Retraining on Cognitive Functioning among Young Adults with Excessive Gadget Usage

Senthil Kumar. S¹, and Deepa Sundareswaran^{2*}

¹Undergraduate student, Meenakshi College of Occupational Therapy, Meenakshi Academy of Higher Education and Research (MAHER), Chennai, India

²Principal, Meenakshi College of Occupational Therapy, Meenakshi Academy of Higher Education and Research (MAHER), Chennai, India

*Corresponding Author
Deepa Sundareswaran

Article History

Received: 03.03.2025

Revised: 20.03.2025

Accepted: 15.04.2025

Published: 10.05.2025

Abstract: Excessive gadget use among young adults has been associated with impairments in attention, memory, and other cognitive domains. This study aimed to evaluate the effect of cognitive retraining on cognitive functioning in young adults with excessive gadget usage. A cross-sectional design was adopted with 20 participants aged 18–25 years, screened using the Smartphone Addiction Scale–Short Version. Cognitive functioning was assessed before and after intervention using the Addenbrooke’s Cognitive Examination III (ACE-III). Participants received 12 cognitive retraining sessions over six weeks, each lasting 45 minutes and targeting attention, memory, fluency, language, visuospatial skills, and problem-solving. Post-intervention results showed significant improvement in all ACE-III domains, with the greatest gains observed in memory, and the overall cognitive score increasing from a mean of 75.35 to 87.10 ($p < 0.001$). No significant differences were found between male and female participants in cognitive improvement. The findings indicate that cognitive retraining is effective in enhancing cognitive functions among young adults with excessive gadget use, highlighting its potential role as an occupational therapy intervention to address cognitive difficulties related to digital overuse.

Keywords: Cognitive retraining, Gadget addiction, ACE-III, Occupational therapy, Young adults.

INTRODUCTION

The widespread use of smartphones and digital gadgets has transformed modern life, offering instant access to information and entertainment. However, excessive gadget use among young adults has been increasingly associated with negative consequences on mental health and cognitive functioning. Studies have shown that overuse of digital devices can lead to attention deficits, impaired memory, reduced executive control, and poor academic or occupational performance. These effects are particularly concerning in young adults, as this age group is in a critical developmental stage for higher-order cognitive processes.

Occupational therapists play a significant role in addressing such issues through cognitive retraining interventions aimed at enhancing or restoring impaired cognitive skills. Cognitive retraining utilizes structured and graded activities designed to improve domains such as attention, memory, language, visuospatial skills, and executive functioning. Previous research highlights its effectiveness in populations with neurological conditions and cognitive impairments, but its application in technology-related cognitive issues remains underexplored.

Given the rising prevalence of gadget addiction and its potential impact on daily functioning, there is a growing need for evidence-based interventions targeting cognitive enhancement in this population. The present study was conducted to evaluate the effectiveness of a structured cognitive retraining program on the cognitive functioning of young adults with excessive gadget usage.

METHODOLOGY

Participants; Twenty young adults aged 18–25 years who scored high on the Smartphone Addiction Scale–Short Version (SAS-SV) were recruited. Participants with neurological or psychiatric conditions were excluded.

Tools

- Smartphone Addiction Scale–Short Version (SAS-SV): Screening tool for excessive gadget usage.
- Addenbrooke’s Cognitive Examination III (ACE-III): Pre- and post-intervention assessment of attention, memory, fluency, language, and visuospatial skills.

Intervention

Participants underwent 12 cognitive retraining sessions over six weeks (two sessions per week, 45 minutes each). Activities targeted:

- Attention: Task switching, digit span, and Stroop tasks.
- Memory: Story recall, word lists, and paired associations.
- Fluency: Category naming and letter fluency tasks.
- Language: Sentence construction, comprehension, and naming tasks.
- Visuospatial Skills: Puzzles, block design, and figure copying.
- Problem-Solving: Sequencing tasks, planning activities, and logical reasoning exercises.

Data Analysis

Paired t-tests were used to compare pre- and post-intervention ACE-III scores.

RESULTS

Significant improvements were observed in all cognitive domains of the ACE-III following cognitive retraining:

- Memory: Mean increase of 5.05 points ($p < 0.001$).
- Attention: Mean increase of 3.60 points ($p < 0.01$).
- Fluency, Language, and Visuospatial Skills: All domains demonstrated statistically significant improvement ($p < 0.05$).
- Overall ACE-III Score: Improved from a mean of 75.35 (pre-test) to 87.10 (post-test) ($p < 0.001$).

No significant gender differences were noted in cognitive gains.

DISCUSSION

This study demonstrates that cognitive retraining can significantly improve cognitive functioning in young adults with excessive gadget use. The greatest improvement was observed in memory, consistent with previous evidence that structured cognitive exercises can enhance encoding and retrieval processes. Enhancements in attention and executive functioning further support the potential of cognitive retraining as a preventive measure for technology-related cognitive decline. Unlike neurological conditions where retraining is rehabilitative, in this context it serves as a preventive and performance-enhancing strategy. The absence of gender differences suggests broad applicability of this intervention.

CONCLUSION

Cognitive retraining significantly improved cognitive functioning among young adults with excessive gadget use. Occupational therapy programs should consider integrating cognitive retraining into interventions for individuals at risk of digital overuse, as it can mitigate cognitive difficulties and enhance overall functioning.

LIMITATIONS

- The present study carried out with a small sample size.
- Study was done on restricted age group 18 to 25.
- Study focused only on participants from one particular region

RECOMMENDATIONS

- A larger sample size could be considered.
- Longer duration of intervention could be considered.
- The present study can be done in a different geographical region.
- Study can be done on different age group.
- An experimental study can be carried out.

•Participants from other professions can be taken into consideration.

DECLARATION: *The authors have no conflict of interest*

REFERENCE

1. Mowshomi ML, Iktidar MA, Roy S, Jallow M, Chowdhury S, Tabassum MN. Gadget addiction among school-going children and its association with cognitive function: A cross-sectional survey. *BMJ Paediatrics Open.* 2023 Feb 8.
2. Diya N, Kumar K. Cognitive retraining in traumatic brain injury. *Neuropsychological Trends.* 2012 Nov.
3. Shahzadi M, Rajender G, Sharma V, Singh TB. Efficacy of cognitive retraining techniques in children with learning disability. *Delhi Psychiatry Journal.* 2009.
4. Yewale PG, Mate S, Khaire U. Correlation of gadget addiction with different Prakriti among children. *Journal of Xi'an Shiyou University, Natural Science Edition.* 2023 Apr.
5. Wilmer H, Sherman LS, Chein JM. Smartphones and cognition: A review of research exploring links between mobile technology habits and cognitive functioning. *Frontiers in Psychology.* 2017 Apr.
6. Rema MK, Bhuvaneshwari D. Impact of intervention in gadget usage among children. *Journal of Women's Health & Safety Research.* 2021 Jan 30.
7. Kumar AK, Sherkhane MS. Assessment of gadget addiction and its impact on health among undergraduates. *International Journal of Community Medicine and Public Health.* 2018 Aug.