Treatment & Research

Multiple Sclerosis

happyneuron

Duration, Frequency, Intensity Meta-Analysis

This complied meta-analysis aims to identify structures necessary for maximizing the effectiveness of an adaptable cognitive training program for different disorders and diseases.

More specifically, we compiled the current research to answer these overarching questions:
- How much should someone train to significantly improve his/her cognitive profile?
- Is there an ideal regimen or approach to brain training that produces the optimal results?

Research has proven that brain training conducted in certain criteria may yield positive results for certain populations. As with any form of rehabilitation, cognitive training exercises' duration, frequency, and intensity should be determined based on appropriate diagnosis/assessment. These assessments and diagnoses should be completed by a trained professional with the individual functional needs of the individual in mind.

Disclosure:
This meta-analysis aims to create a place for clinicians to find the research connected with brain training easily. HappyNeuron is not claiming that participating in any form of brain training will result in higher functions, full recovery, or delayed disease onset. The information below is non-bias compliance of the evidence of computerized brain training to be used as a source reference or a supporting document for clinicians to use to help with the care of their clients. Some of this research uses our product, while others use other digital tools.

Multiple Sclerosis (MS)

Multiple sclerosis (MS) is an autoimmune disease where the immune system attacks the fatty coating around the brain and spinal cord nerves known as myelin. This process is known as demyelination or the removal of myelin. As multiple sclerosis progresses, people living with multiple sclerosis may experience muscle weakness, spasms, paralysis, seizures, depression, and cognitive changes in memory. Multiple sclerosis has no cure, but the current treatment involves a combination of therapies and medications to prevent disease progression and manage symptoms.

What are the normal cognitive deficits of individuals with MS?

The cause of MS is still unknown. Researchers are looking at the influence of genetic mutations and environmental factors as contributors. They currently know that MS may debilitate motor skills and cognitive functions as the disease progresses. Patients may experience fatigue, speech problems, **depression**, and cognitive dysfunction. Cognitive areas affected by MS include **processing speed, memory, visual attention**, and **visuospatial skills**. Cognitive decline is experienced by at least 50% of patients, with severity increasing as the disease progresses (Menascu).

Prevention of cognitive decline in Multiple Sclerosis (MS) is of major importance. This paper explores the effect of a 6 months computerized game training program (HappyNeuron Pro) on cognitive performance in MS patients with mild cognitive impairment.

Results/Conclusion

In the referenced study on individuals with MS, ***Executive Function performance significantly increased at as early as 3 months, while in non-training patients, executive function performance significantly decreased at 6 months***. Information processing speed significantly increased over 3 and 6 months, while in non-training patients, information processing speed performance mildly decreased at 6 months. These findings imply that cognitive training can contribute to better performance in daily activities that require these cognitive capabilities (Menascu, 2021).

Further studies may be required to assess the longevity of that effect. However, we still highly recommend that MS patients be engaged in a cognitive training practice as part of an approach to treating their condition.

Research

This was a randomized prospective study. Enrolled in this study were 100 eligible MS patients who each had mild cognitive impairment in either executive function or information processing speed. Patients were randomized 1:1 to either use the cognitive games platform by HappyNeuron (HN) or receive no intervention. Executive function and information processing speed scores were measured at 3 and 6 months from baseline to evaluate the effect of game training on cognitive scores. (Menascu, 2021).

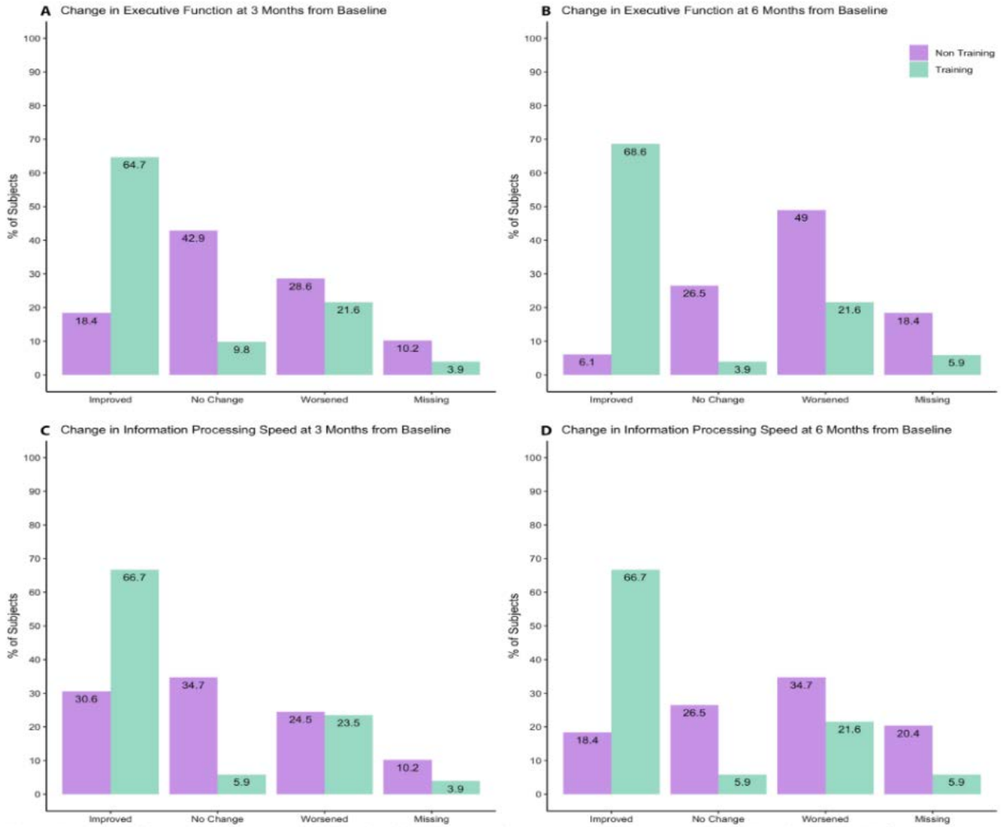
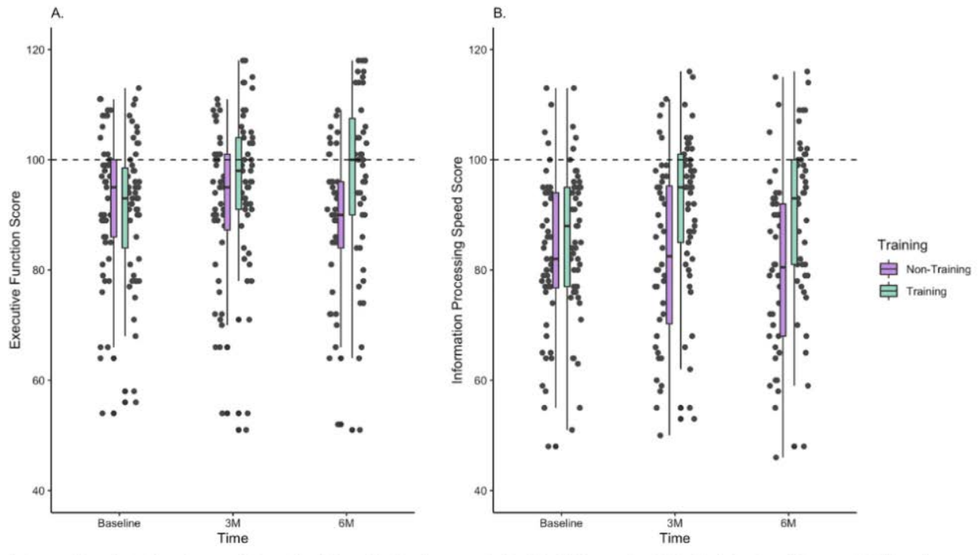


Fig. 2 Frequency of patients who improved/remained stable, or worsened in executive function at 3 months (**A**) and 6 months (**B**) from baseline, and information processing speed score at 3 months (**C**) and 6 months (**D**) from baseline, in Training and Non-Training groups



Scatter and box plots at baseline, 3 and 6 months, **A** Executive function scores in Training (light green) and Non-Training (purple) groups. **B** Information processing speed in Training (red) and Non-Training (blue) groups. Box plots include median, IQR, minimum and maximum values

References

Menascu, S. (2021). Targeted cognitive game training enhances cognitive performance in multiple sclerosis patients treated with interferon beta 1-a. Journal of NeuroEngineering and Rehabilitation, 175. https://jneuroengrehab.biomedcentral.com/articles/10.1186/s12984-021-00968-3

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