



EFFECT OF NEUROPLASTICITY BASED BRAIN FIT MIND EXERCISES IN IMPROVING ATTENTION SKILL AMONG SCHOOLSTUDENTS

Manjula S.^{1*}, P. Senthil Selvam², S. S. Subramanian³, Kumaresan A.⁴ and Shobana P.⁵

¹MPT, Asst Prof, School of Physiotherapy, Vistas, Thalambur, Tamil Nadu- 600130, India.

²PHD, Prof, HOD, School of Physiotherapy, Vistas, Thalambur, Tamil Nadu- 600130, India.

³PHD, Prof & Dean, Sree Balaji College of Physiotherapy, Chennai, Tamil Nadu- 600130, India.

⁴PHD, Prof, Saveetha College of Physiotherapy, Simats, Chennai, Tamil Nadu- 600130, India.

⁵MPT, School of Physiotherapy, Vistas, Thalambur, Tamil Nadu- 600130, India.

***Corresponding Author: Manjula S.**

MPT, Asst Prof, School of Physiotherapy, Vistas, Thalambur, Tamil Nadu- 600130, India.

Article Received on 02/5/2023

Article Revised on 22/5/2023

Article Accepted on 12/6/2023

ABSTRACT

Background of the study: Learning occurs consciously or unconsciously after the interaction with the environment and that the person has cognitive, emotional and deviant changes after learning. Neuroplasticity (brain based) learning theory is defined as biochemical change in increase in the number of synapses to form new neural connections. **Aim & Objective of the study:** The aim of the study was to assess that the effect of neuroplasticity-based brain fit mind exercises in improving the attention skills among school students. **Methodology:** It was an experimental study which was conducted with a total of 50 participants, with 25 samples in experimental group (GROUP A) and 25 samples in control group (GROUP B). Experimental group performed neuroplasticity based brain fit mind exercises and the control group performed brain gym exercises. **Outcome measures:** IVA PLUS (integrated visual and auditory continuous performance test) Attention control scale (ATTC). **Results:** The study proved that the neuroplasticity based brain fit mind exercises improved attention skills among school students.

KEYWORDS: Neuroplasticity, Brain fit mind exercises, Attention, Learning, Cognition, Synapses and Neural connection.

INTRODUCTION

Educational Kinesiology or Brain Gym, is an approach to learning directed toward Specific neurological effects, to the clarification and implementation of life goals. The word kinesiology means “the science of movement”, and so Brain Gym is based on the principle that we can educate the whole person through movement.^[6] Brain Gym is used in school systems around the world to help students achieve more easily. Brain Gym is used in the business world to help workers at all skill levels to do their work more effectively and easily.^[9] Brain Gym is used in athletics, promoting both personal skill and team communication. Brain Gym is a wonderful personal growth tool, allowing people to make rapid changes in areas where they may have felt “stuck” for a long time. Attention is the ability to focus on certain aspects or objects. It includes the abilities to receive the information and to select what is relevant from the incoming stimulation. Attention is the prerequisites of memory to communicate and execute brain function.

Neuroplasticity is ability of the brain to adapt to changes

in an individual’s environment by forming new neural connections over time. Neuroplasticity is sometimes referred to as “brain plasticity”^[1] Aspects of our brain are plastic, meaning they are adaptive and can be altered in response to environmental or structural changes^[7] Brain fit mind exercises include training new language, performing activities in non-dominant hand, aerobic exercises to improve attention skills, brain gym exercises and meditation.^[2] These induce the brain to adapt new skills and in turn improve the neural synapses. Brain gym the phrase usually describes a specific set of movements, processes, programs, materials, and educational philosophy. Improvements in areas such as Concentration and focus then memory also Academics, reading, writing, math, test taking also the physical coordination, self-responsibility, organization skills and attitude.

Aim and Objective of the study

The aim of the study was to assess that the effect of neuroplasticity-based brain fit mind exercises in improving the attention skills among school students.

RESEARCH DESIGN AND METHODOLOGY:

An experimental study design was conducted with 50 samples, who fulfilled the inclusion and exclusion criteria.

Inclusion criteria:

- Primary school students
- Age group between (11 to 12 years)
- Both male and female
- Attention control scale (score >2)

Exclusion criteria:

- Attention control scale(score<2)
- Cognitive impairments like autism, intellectual disability.
- Any neurological deficits like hydrocephalus, craniofacial anomalies, epilepsy and seizures.

Outcome measures

Attention

Material used:

Integrated Visual and Auditory continuous performance TEST (IVA PLUS).

Procedure:

It was an experimental study, where the samples were recruited based on the inclusion and exclusion criteria. Written informed consent was obtained from the samples. The total number of samples 50 was divided into two groups, Group A and B namely experimental and control group, 25 samples in each group. Both the groups were initially assessed for attention deficits by means of integrated visual and auditory continuous performance test. Attention control scale which is a questionnaire, used to examine the level of attention and focusing skills in the individual. The experimental group

were given brain fit mind exercises which includes training a new language, performing activities in non-dominant hand, aerobic exercises, brain gym exercises, and meditation. Experimental group performed the exercises for about 45 min/day, 5 days /week for 11 weeks. The control group performed the brain gym exercises alone, each for about 5 minutes and totally of 45 minutes /day, 5 days /week for 11 weeks. Pre and post test scores was analysed.

Treatment protocol:**Group A-Experimental group****It includes:**

- Training new language
- Performing activities in non dominant hand
- Aerobic exercises
- Brain gym exercises
- Meditation
- Experimental group performed the exercises for about 45 min/day, 5 days /week for 11 weeks.

Group B-Control Group**Brain gym exercises:**

Activities	
1. Drinkingwater	6. Belly breathing
2. Crosscrawl	7. Brainbuttons
3. Think OF 'X'	8. The thinkingcap
4. Lazyeight	9. Calfpumps
5. Neckrolls	10. The Energizer

Brain gym exercises alone, each for about 5 minutes and totally of 45 minutes /day, 5 days /week for 11 weeks

Data analysis

Data analysis was done. Pre-test and post-test values of the control group and experimental group were statistically analyzed by means of t-test. The significance levels used for this study was $P < 0.05$

Table 1: Experimental group.

Iva Group a	Mean	Standard Deviation	P value	Significance
Pre test	75.9	9.1	0.00000135	$P < 0.001$
Post test	84	6.7		

Table 2: Control group.

Iva Group b	Mean	Standard Deviation	P value	Significance
Pre test	74.8	7	0.0001235	$P < 0.001$
Post test	75.4	6.9		

RESULT

On comparing the mean values of group A & B on IVA continuous performance test, there was a significant increase in post-test mean in both the groups, but group A (experimental group) was more effective than group B (control group) at $p < 0.001$. From the pre and post test scores, it was evident that Neuroplasticity based brain fit mind exercises was more effective in improving attention

among school students.

CONCLUSION

This study concluded that Neuroplasticity based brain fit mind exercises was more effective in improving attention among school students.

REFERENCES

1. Ge S., Yang C., Hsu K., Ming G., Song H. A critical period for enhanced synaptic plasticity in newly generated neurons of the adult brain. *Neuron*, 2007; 54: 559–566. 10.1016/j.neuron.2007.05.002
2. Chudler, E. H. Brain Plasticity: What Is It? Learning and Memory. Retrieved from, 2016. (02.06.2017)
3. Corbett, B. A., & Constantine, L. J. Autism and attention deficit hyperactivity disorder: Assessing attention and response control with the integrated visual and auditory continuous performance test. *Child Neuropsychology*, 2015; 12(4-5): 335-348.
4. Czéh, B., Michaelis, T., Watanabe, T., Frahm, J., de Biurrun, G., van Kampen, M., Fuchs, E. Stress-induced changes in cerebral metabolites, hippocampal volume, and cell proliferation are prevented by antidepressant treatment with tianeptine. *Proceedings of the National Academy of Sciences*, 2001; 98(22): 12796- 12801.
5. Fisher, M., Holland, C., Merzenich, M. M., & Vinogradov, S. Using neuroplasticity-based auditory training to improve verbal memory in schizophrenia. *American Journal of Psychiatry*, 2017; 166(7): 805-811. doi:10.1176/appi.ajp.2009.08050757
6. Hensch, T. K. The power of the infant brain. *Scientific American*, 2016; 314(2): 64-69.
7. Hornickel, J., Zecker, S. G., Bradlow, A. R., & Kraus, N. *Proceedings of the National Academy of Sciences*, 109(41), 167doi:10.1073/pnas.1206628109.
8. Hyde, K. L., Lerch, J., Norton, A., Forgeard, M., Winner, E., Evans, A. C., & Schlaug, G. Musical training shapes structural brain development. *Journal of Neuroscience*, 2009; 29(10): 3019-3025. doi:10.1523/JNEUROSCI.5118- 08.2009
9. Kalia, M. Brain development: anatomy, connectivity, adaptive plasticity, and toxicity. *Metabolism*, 2018; 57: S2-S5. doi:10.1016/j.metabol.2018.07.009
10. Keleş, E., & Çepni, S. Beyin ve öğrenme. *Türk Fen Eğitimi Dergisi*, 3(2).
11. Mundkur, N. Neuroplasticity in children. *Indian journal of pediatrics*, 2015; 72(10): 855-857.