



The Effect of Neurofeedback (NFB) on children with Attention Deficit Hyperactivity Disorder (ADHD)

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

وَعَلَّمَكَ مَا لَمْ تَكُنْ تَعْلَمُ وَكَانَ فَضْلُ اللَّهِ
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Abstract

Background: ADHD is one of the most common neurodevelopmental and psychiatric disorders of childhood. NFB is a comprehensive training system that facilitates changes in brain waves. The aim of this study is to assess whether NFB can be considered a treatment modality for ADHD.

Methods: The present study is a clinical trial randomized study that was conducted on 84 patients who were divided into two main groups: Group (A): freshly diagnosed cases of ADHD patients who were only receiving sessions of NFB. Group (B): cases of ADHD patients who were receiving both NFB sessions and medications. All participants were treated with methylphenidate capsules with a total dose of 1mg/kg/day in the form of long acting capsules. The total dose was between 20-60 mg. compliance and side effects were recorded. Both groups received 20 sessions of NFB.

Results: there was statistically significant improvement in both groups on NFB therapy with a higher reduction rate in the group receiving combined treatment (NFB and medications).

Conclusion: NFB can be considered a treatment modality for improving the symptomatology of ADHD.

Keywords: attention deficit hyperactivity disorder, neurofeedback, theta beta ratio

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List of Abbreviations

Abb.	Full term
<i>ADHD</i>	<i>Attention Deficit Hyperactivity Disorder</i>
<i>ANS</i>	<i>Autonomic Nervous System</i>
<i>BCI</i>	<i>Brain Computer Interface</i>
<i>CNV</i>	<i>Continuous Negative Variation</i>
<i>CNV</i>	<i>Contingent Negative Variation</i>
<i>CPRS-R:L</i>	<i>Conners Parent Rating Scale-Revised- Long Version</i>
<i>CPT</i>	<i>Continuous Performance Task</i>
<i>DSM</i>	<i>Diagnostic And Statistical Manual</i>
<i>EEG</i>	<i>Electro-Encephalogram</i>
<i>FMRI</i>	<i>Functional Magnetic Resonance Imaging</i>
<i>HD</i>	<i>Hyperkinetic Disorder</i>
<i>HEG</i>	<i>Hemoencephalography</i>
<i>HKD</i>	<i>Hyperkinetic Disorder</i>
<i>HKD/HD</i>	<i>Hyperkinetic Disorder</i>
<i>ICD</i>	<i>International Classification Of Disease</i>
<i>ICD</i>	<i>The International Classification Of Diseases</i>
<i>ILF</i>	<i>Infra Low Frequency</i>

Abb.	Full term
<i>LENS</i>	<i>Low Energy Neurofeedback System</i>
<i>LFP</i>	<i>Local Field Potential</i>
<i>LORETA</i>	<i>Low Resolution Brain Electromagnetic Tomography</i>
<i>MPH</i>	<i>Methylphenidate</i>
<i>MTA</i>	<i>Multi-Modat Treatment Study</i>
<i>NFB</i>	<i>Neurofeedback</i>
<i>nirHEG</i>	<i>Near Infrared Heg</i>
<i>pirHEG</i>	<i>Passive Infrared Heg</i>
<i>QEEG</i>	<i>Quantitative Electroencephalogram</i>
<i>RP</i>	<i>Readiness Potential</i>
<i>SCP</i>	<i>Slow Cortical Potential</i>
<i>SD</i>	<i>Standard Deviation</i>
<i>SMR</i>	<i>Sensorimotor Rhythm</i>
<i>TBR</i>	<i>Theta Beta Ratio</i>
<i>WHO</i>	<i>World Health Organization</i>