

## ADHD children and adolescent - Neurofeedback treatment: A randomized controlled clinical trial - Effect of core symptoms

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A randomized controlled study was performed to assess the effectiveness of neurofeedback treatment (NFT) for Attention Deficit/Hyperactivity Disorder (ADHD) children and adolescents. The ADHD population was selected from an outpatient clinic for Child and Adolescent Mental Health in Norway. Ninety-one of 275 children and adolescents ranging in age from 6 to 18 years with a mean of 10.5 years participated in a 30-session program of intensive NFT. It provided reinforcement contingent on the production of cortical beta1 activity (15–18 Hz). Children and adolescents were randomized into three groups: 31 were assigned to the medication (control) group that received methylphenidate (MED), 30 to the neurofeedback and methylphenidate group (NF+MED), and 30 to the neurofeedback group (NF). ADHD core symptoms were addressed using the Clinician's Manual for Assessment and Parent Training from Russell A. Barkley. Ninety-one children and adolescents completed the study and were randomized according to age, gender, intelligence, and distribution of ADHD core symptoms (hyperactivity and inattention). All three types of treatments had a significant effect on hyperactivity within their groups, while no significant effect on attention was observed in the NF group. The best statistical changes were found in tested children from the NF+MED group, with mean values of total score (10.90; SD 10.51;  $p$  0.001), hyperactivity, (7.5; SD 5.73;  $p$  0.001), and attention (3.38; SD 5.52;  $p$  0.008).

After NFT, there was significant improvement in hyperactivity but no improvement in attention. This improvement was equally distributed in all three groups. The largest improvements in core symptoms were found in the combined treatment group (NF+MED).

### Biography

Dr Duric is completing her doctorate in child and adolescent psychiatry with analytical approach on treatment of ADHD with neurofeedback at the University of Bergen. She directed her research further on evaluation if neurofeedback was approximately as effective in treating of ADHD symptoms as medication and if medication could be replaced. Further she made design-multiple measures study to evaluate use of QEEG in differential diagnosis in child and adolescent psychiatry. This leads to the development of extended use of QEEG in diagnostic purpose in child and adolescent psychiatry generally. She joined the international group of researchers for neurofeedback treatment as member of Biofeedback Foundation of Europe. She has also joined the Norwegian Child and Adolescent Association in 1998. She was professional Chief adviser for Clinic for Child and Adolescent Psychiatry Haugesund in many years. Dr. Duric served in United Nation High Commissioner for Refugees Regional Office for Europe in 1994-5 and worked with post traumatic children in war zones. She established and became the first Director of Psycho Social Center for children with PTSD Konjic, European office in 1996.

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