Table H-7. Findings on neurofeedback interventions for ADHD

| **Study**  **(Companion)**  **N**  **Qualitya**  **Design**  **Age Categoryb** | **Intervention** | **Comparison** | **Follow-up Times** | **Findings–Intervention** | **Findings–Comparison** | **Between group P value** |
| --- | --- | --- | --- | --- | --- | --- |
| **Acceptability of treatment** | | | | | | |
| Gevensleben, 200933  (Gevensleben, 201034  Wangler, 201135)  102  Good  RCT  b | Neuro-feedback training | Attention skills training | 2 months | Effectiveness of treatment  Mean = 3.19 (SD = .82)  Parent rated motivation of their children to participate in treatment  Mean = .64 (SD = .77) | Effectiveness of treatment  Mean = 3.13 (SD = .90)  Parent rated motivation of their children to participate in treatment  Mean = .56 (SD = 1.13) | p=.77  p = .71 |
| **Behavior changes** | | | | | | |
| Gelade, 201626  103  Good  RCT  b | Neuro-  feedback  training | Physical activity | 12 weeks | SWAN-Inattention (parent)  Mean = -0.32 (95% CI: -0.53, -0.10  SWAN-Hyperactivity/Impulsiveness (parent)  Mean = -0.29 (95% CI: -0.50, -0.07)  SWAN-Inattention (teacher)  Mean = -0.10 (95% CI: -0.31, -0.11)  SWAN-Hyperactivity/Impulsiveness (teacher)  Mean = -0.03 (95% CI: -0.28, 0.23) | SWAN-Inattention (parent)  Mean = -0.17 (95%CI: -0.37, 0.02)  SWAN-Hyperactivity/Impulsiveness (parent)  Mean = -0.21 (95% CI: -0.41, -0.01)  SWAN-Inattention (teacher)  Mean = -0.05 (95% CI: -0.23, -0.12)  SWAN-Hyperactivity/Impulsiveness (teacher)  Mean = -0.02 (95% CI: -0.18, 0.13) | NS  NS  NS  NS |
| **Changes in standardized symptom scores** | | | | | | |
| Bink, 201536  90  Good  RCT  b | Neuro-feedback plus treatment as usual | Treatment as usual | 0 months baseline  6 months | ADHD-RS Inattention  Mean=4.4 (SD=2.49)  ADHD-RS Hyperactivity/inattention  Mean=3.44 (SD=2.12)  Youth Self Report Total score  Mean=48.5 (SD=22.01)  CBCL Total score  Mean=60.81 (SD=28.57)  ADHD-RS Inattention  Mean=2.84 (SD=2.59)  ADHD-RS Hyperactivity/inattention  Mean=2.36 (SD=2.16)  Youth Self Report Total score  Mean= 40.43 (SD=18.24)  CBCL Total score  Mean= 53.35 (SD= 27.55) | ADHD-RS Inattention  Mean=5.27 (SD=2.16)  ADHD-RS Hyperactivity/inattention  Mean=3.27 (SD=2.01)  Youth Self Report Total score  Mean=52.58 (SD=18.89)  CBCL Total score  Mean=63.77 (SD=27)  ADHD-RS Inattention  Mean=3.62 (SD=2.45)  ADHD-RS Hyperactivity/inattention  Mean=2.38 (SD=2.14)  Youth Self Report Total score  Mean= 46.12 (SD=20.17)  CBCL Total score  Mean=52.81 (SD=30.28) | NS |
| Gevensleben, 200933  (Gevensleben, 201034  Wangler, 201135)  102  Good  RCT  b | Neuro-feedback training | Attention skills training | 2 months | German ADHD rating scale  Mean within group change = -.39 (SD = .37) | German ADHD rating scale  Mean within group change = -.1 (SD = .44) | p<.005 |
| Moreno-Garcia, 201532  57  Fair  RCT  b | Neuro-feedback | Standard Pharmacological Treatment  Behavioral Treatment | NR | Integrated Visual and Auditory Continuous Performance Test – Full Scale Attention  Mean = 2.1 (SD = 16.88) | Integrated Visual and Auditory Continuous Performance Test – Full Scale Attention  Mean = 28.57 (SD = 11.67)  Changes in standardized symptom scores  Integrated Visual and Auditory Continuous Performance Test – Full Scale Attention  Mean = 3.88 (SD = 16.24) | p =.002  p =.013 |
| Steiner, 201437  (Steiner, 201438)  104  Good  RCT  b | Neuro-feedback | Cognitive training  Control |  | Conner 3 Parent Inattention  Within-group effect size = -0.8  Conners 3 Parent Executive Functioning  Within-group effect size = -0.49  Conners 3 Parent Global Index  Within-group effect size = -0.37  Conners 3 Teacher Inattention  Within-group effect size = -0.25 | Conner 3 Parent Inattention  Within-group effect size = -0.46  Conners 3 Parent Executive Functioning  Within-group effect size -0.12  Conners 3 Parent Global Index  Within-group effect size = -0.09  Conners 3 Teacher Inattention  Within-group effect size = -0.24  Conner 3 Parent Inattention  Within-group effect size = -0.15  Conners 3 Parent Executive Functioning  Within-group effect size = -0.09  Conners 3 Parent Global Index  Within-group effect size = -0.05  Conners 3 Teacher Inattention  Within-group effect size =0 | p<.05  p<.001  p<.001  p<.001 |
| **Sleep disturbance** | | | | | | |
| Gelade, 201626  103  Good  RCT  b | Neuro-  feedback  training | Physical activity | 12 weeks | SDSC  Mean = -2.16 (95% CI: -4.82, 0.51) | SDSC  Mean = -1.03 (95% CI: -2.86, 0.80) | NS |

a See Methods section “Quality Assessment of Individual Studies” for definitions of quality assessment ratings.

b Age categories: a = children aged ≤6 years, b = children aged 7-17, c = children of all ages ≤17.

Abbreviations: ADHD=attention deficit hyperactivity disorder; CBCL=Child Behavior Checklist; RS=rating scale; SD=standard deviation