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, 201034Wangler, 201135)102GoodRCTb | Neuro-feedback training  | Attention skills training  | 2 months | Effectiveness of treatmentMean = 3.19 (SD = .82)Parent rated motivation of their children to participate in treatmentMean = .64 (SD = .77)  | Effectiveness of treatmentMean = 3.13 (SD = .90)Parent rated motivation of their children to participate in treatmentMean = .56 (SD = 1.13)  | p=.77p = .71 |
| **Behavior changes** |
| Gelade, 201626103GoodRCTb | Neuro-feedback training  | Physical activity | 12 weeks | SWAN-Inattention (parent)Mean = -0.32 (95% CI: -0.53, -0.10SWAN-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) | NSNSNSNS |
| **Changes in standardized symptom scores** |
| Bink, 20153690GoodRCTb | Neuro-feedback plus treatment as usual  | Treatment as usual  | 0 months baseline6 months | ADHD-RS InattentionMean=4.4 (SD=2.49)ADHD-RS Hyperactivity/inattentionMean=3.44 (SD=2.12)Youth Self Report Total scoreMean=48.5 (SD=22.01)CBCL Total scoreMean=60.81 (SD=28.57)ADHD-RS InattentionMean=2.84 (SD=2.59)ADHD-RS Hyperactivity/inattentionMean=2.36 (SD=2.16)Youth Self Report Total scoreMean= 40.43 (SD=18.24)CBCL Total scoreMean= 53.35 (SD= 27.55) | ADHD-RS InattentionMean=5.27 (SD=2.16)ADHD-RS Hyperactivity/inattentionMean=3.27 (SD=2.01)Youth Self Report Total scoreMean=52.58 (SD=18.89)CBCL Total scoreMean=63.77 (SD=27)ADHD-RS InattentionMean=3.62 (SD=2.45)ADHD-RS Hyperactivity/inattentionMean=2.38 (SD=2.14)Youth Self Report Total scoreMean= 46.12 (SD=20.17)CBCL Total scoreMean=52.81 (SD=30.28) | NS |
| Gevensleben, 200933(Gevensleben, 201034Wangler, 201135)102GoodRCTb | Neuro-feedback training  | Attention skills training  | 2 months | German ADHD rating scaleMean within group change = -.39 (SD = .37) | German ADHD rating scale Mean within group change = -.1 (SD = .44) | p<.005 |
| Moreno-Garcia, 20153257FairRCTb | Neuro-feedback  | Standard Pharmacological TreatmentBehavioral Treatment | NR | Integrated Visual and Auditory Continuous Performance Test – Full Scale AttentionMean = 2.1 (SD = 16.88) | Integrated Visual and Auditory Continuous Performance Test – Full Scale AttentionMean = 28.57 (SD = 11.67)Changes in standardized symptom scoresIntegrated Visual and Auditory Continuous Performance Test – Full Scale AttentionMean = 3.88 (SD = 16.24) | p =.002p =.013 |
| Steiner, 201437(Steiner, 201438)104GoodRCTb | Neuro-feedback | Cognitive trainingControl |  | Conner 3 Parent InattentionWithin-group effect size = -0.8Conners 3 Parent Executive FunctioningWithin-group effect size = -0.49Conners 3 Parent Global IndexWithin-group effect size = -0.37Conners 3 Teacher InattentionWithin-group effect size = -0.25 | Conner 3 Parent InattentionWithin-group effect size = -0.46Conners 3 Parent Executive FunctioningWithin-group effect size -0.12Conners 3 Parent Global IndexWithin-group effect size = -0.09Conners 3 Teacher InattentionWithin-group effect size = -0.24Conner 3 Parent InattentionWithin-group effect size = -0.15Conners 3 Parent Executive FunctioningWithin-group effect size = -0.09Conners 3 Parent Global IndexWithin-group effect size = -0.05Conners 3 Teacher InattentionWithin-group effect size =0 | p<.05p<.001p<.001p<.001 |
| **Sleep disturbance** |
| Gelade, 201626103GoodRCTb | Neuro-feedback training | Physical activity | 12 weeks | SDSCMean = -2.16 (95% CI: -4.82, 0.51) | SDSCMean = -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