**Cognitive Remediation Interventions in Schizoaffective Disorder: A Systematic Review.**

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Abstract:

Background:

Patients with schizoaffective disorder (SAD) suffer from cognitive impairment, which negatively influences their functionality. Cognitive remediation (CR) interventions have been shown to be effective in patients with schizophrenia (SZ) and bipolar disorder (BD), but evidence in SAD is limited so far. The aim of this study is to systematically review the published data on CR interventions, either in neurocognition or social cognition, in patients with SAD.

Methods:

We conducted a comprehensive, computerized literature search using terms related to CR interventions in psychotic and affective disorders, and particularly in SAD. Pubmed, Embase, and Web of Knowledge databases were used up to February 28th, 2018 according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement. The search returned 2672 articles of which four were finally selected meeting the inclusion criteria.

Results:

Cognitive Enhancement Therapy, computerized Cognitive Remediation Therapy and Cognitive Training showed positive results in subsamples of patients with SAD regarding neurocognition and functioning in comparable terms to patients with schizophrenia as well as in a greater extent in quality of life. Benefits in social cognition were also described when Social Cognition Interaction Training was considered in patients with SAD.

Conclusions:

CR interventions seem to improve neurocognition and social cognition in patients with SAD as well as functioning and quality of life. However, further randomized controlled trials on CR interventions with an optimized design focusing on selected sample of patients with SAD are imperative.

In this article, the study selection criteria, CR intervention and analysis methods were described in detail. 4 articles were selected as the below:

**Table 1**

Characteristics of the studies selected on Cognitive Remediation interventions in schizoaffective disorder.

| **Study** | **Sample characteristics** | **Sample diagnosis (n)** | **Design** | **Outcome measures** | **Results summary** | **Limitations** |
| --- | --- | --- | --- | --- | --- | --- |
| Lahera et al. ([54](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6180287/#B54)) | 37 outpatientsAge = 39.2 (10.4) years oldGender = 64.9% femaleIllness = 13.3 (7.8) years | BDI = 28BDII = 5SAD = 4 | SCIT vs. TAU*n* = 21/16SAD: 14.3% /6.3%Quasi-experimental study | **Social cognition**Emotion cognition: FEIT and FEDTEmotion recognition: ER40ToM: Hinting taskSocial cognitive biases: AIHQ**Psychosocial functioning**: FAST and GAF | Significant group effects on every social cognitive outcome measure except for the AIHQ Intentionality subscale.No evidence of effects on aggressive attributional biases or on global functioning.Similar pattern of results with SAD excluded except no longer a significant group effect on AIHQ Intentionality or FEIT scores. | Quasi-experimental design (5 subjects reassigned after random)Heterogeneous sampleNo follow-up assessment |
| Lewandowski et al. ([8](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6180287/#B8)) | 58 outpatientsAge = 25.9 (6.3) years oldGender = 31.0% femaleIllness = 3.2 (2.2) years | SZ = 38SAD = 20 (12 depressed type, 8 bipolar type) | CET vs. EST*n* = 31/27SAD: 32.3%/37.0%Subanalysis of RCT | **Processing speed:** Simple reaction time, choice reaction time and Visual-spatial scanning**Neurocognition:** WMS-R, California Verbal Learning Test, WAIS-R, TMT B, Wisconsin card sorting test, Tower of London, Neurological evaluation scale**Cognitive style:** Cognitive style and social cognition eligibility interview, Cognitive styles inventory**Social cognition:** Mayer-Salovey-Caruso Emotional Intelligence Test, social cognition profile, Cognitive style and social cognition eligibility interview**Social adjustment:** Social adjustment scale-II, Major role inventory, Global assessment scale, performance potential inventory, DHHS | SZ and SAD improved in multiple neurocognitive and social cognition domains after CET. Diagnosis did not significantly moderate this improvement. SAD had less improvement on neurocognition and cognitive style than SZ.No significant effects in processing speed.SAD groups exhibited significantly greater improvement on symptoms, specifically on depression and anxiety. | Small sample and unequal between groupsDiagnostic stability was unclear in the sample (some patients changed symptoms over the study period) |
| Scheu et al. ([56](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6180287/#B56)) | 32 in- and outpatientsAge = 33.4 (10.4) years oldGender = 46.9% female | SZ = 22SAD = 10 | cCRT (CogPack). 70 CogPack-tasksRetrospective study | **CRT response:** % of improved tasks based on the amount of completed tasks without initial ceiling effects.**Verbal intelligence:** MWT-B**Attention**: Test d2, parameter concentration performance (KL)**Verbal memory:** RBMT**Processing speed and executive functioning:** TMT | The improvement rate was 68% (improved tasks based on the amount of completed tasks without initial ceiling effects). No significant differences between SZ and SAD.No significant relationship between any of the baseline cognitive or symptom measures and improvement rates. | No control groupSmall sampleDichotomous primary outcomesTasks assessment only three times |
|  |  |  |  |  | Better baseline cognition was associated with a higher percentage of tasks with initial ceiling effects.Improvement from baseline to the second assessment after 4 weeks on all neurocognitive functions. Greater improvement in poor cognitive performance or higher values on the PANSS scores at baseline. |  |
| Twamley et al. ([57](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6180287/#B57)) | 89 outpatients51 study completersAge = 47.3 (9.8) years oldGender = 35% femaleIllness = 25.4 (19.2) years | SZ = 45SAD = 39PNOS = 5 | CT+SP vs. SPSubanalysis ofRCT | **Prospective memory**: MIST,**Attention and vigilance**: WAIS-III**Verbal Learning and memory**: HVLT-R**Executive functioning:** WCST-64**Quality of life**: QOLI.**Functional capacity:** UPSA**Cognitive insight**: Beck Cognitive Insight Scale | CT associated improvement was correlated with worse baseline scores on measures of cognitive performance, symptom severity, functional capacity, and self-rated quality of life, cognitive problems, and strategy use.SAD got more improvement than SZ in subjective quality of life at 6 months. | Small samplePassive control group was treatment as usualNo previous measures of motivation or cognitive improvement insight |

*AIHQ, Ambiguous Intentions Hostility Questionnaire; BD, Bipolar Disorder; BDI, Bipolar Disorder Type I; BDII, Bipolar Disorder Type 2; CET, Cognitive Enhancement Therapy; cCRT, Computerized Cognitive Remediation Therapy; CT, Cognitive Training; d2, Aufmerksamkeits-Belastungs-Test; DHHS, Department of Health and Human Services; ER40, Emotion Recognition; EST, Enriched Supportive Therapy; FAST, Functioning Assessment Short Test; FEDT, Face Emotion Discrimination Test; FEIT, Face Emotion Identification Task; GAF, Global Assessment of Functioning scale; HVLT-R, Hopkins Verbal Learning Test-Revised; KL, Concentration Performance value; MIST, Memory for Intentions Screening Test; MWT-B, Mehrfachwahl-Wortschatz-Intelligenztest test B; PNOS, Psychosis Non Specified; QOLI, Quality of life; RBMT, Rivermead Behavioral Memory Test; RCT, Randomized Controlled Trial; SCIT, Social Cognition and Interaction Training; SD, Standard Desviation; SP, Standard Pharmacotherapy; SZ, Schizophrenia; SAD, Schizoaffective disorder; TAU, Treatment As Usual; TMT, Trail Making Test; TMT A, Trail Making Test A; TMT B, Trail Making Test B; ToM, Theory of Mind; UPSA, University of California Performance-Based Skills Assessment; WAIS-III, Wechsler Adult Intelligence Scale Third Edition; WAIS-R, Wechsler Adult Intelligence Scale-Revised; WCST-64, Wisconsin Card Sorting Test-64 Card Version; WMS-R, Wechsler Memory Scale-Revised*.

Very few studies on CR interventions in SAD were included in this article. But all of them suggest that CR interventions not only improve neurocognition and social cognition, but also improve functioning and quality of life of patients with SAD. However, further relevant high quality RCT studies need to be performed to confirm the conclusion.