A systematic review of cognitive remediation for schizo-affective and affective disorders
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CRD summary
The authors concluded that there was preliminary evidence to support cognitive remediation to improve short-term cognitive functioning in patients with schizoaffective and affective disorders. This cautious conclusion seems to be appropriate, but the reliability of the review may be affected by some weaknesses in the methods.

Authors' objectives
To evaluate the effect of cognitive remediation for patients with schizoaffective disorder, affective psychosis, unipolar or bipolar disorder, or any combination of these.

Searching
PubMed, EMBASE, PsycINFO, Web of Science, Current Contents Connect, and Index to Theses were searched for articles from 1990 to 2010. Search terms were reported. The reference lists of included studies and review articles were scanned for further studies. Conference websites and published proceedings were searched.

Study selection
Eligible for inclusion were randomised or quasi-randomised controlled trials, or open studies, of interventions with a manual, to improve cognitive functioning, that were published in English. Eligible patients were those diagnosed with schizoaffective disorder, affective psychosis, unipolar or bipolar disorder, or manic depression, using Research Diagnostic Criteria, the Diagnostic and Statistical Manual of mental disorders (DSM)-III, the revised DSM-III, the DSM-IV, the International Classification of Diseases (ICD)-9, or the ICD-10. Studies had to report between-group or within-subject data, before and after the intervention, with separate data for patients with affective or schizoaffective disorders. Neuropsychological assessments had to include at least one accepted standardised test of cognitive functioning, from the Measurement and Treatment Research to Improve Cognition in Schizophrenia (MATRICS) categories.

Most of the included studies were of patients with schizophrenia or schizoaffective disorders; four included only patients with affective disorders. The mean age of patients was 38.6 years (SD 8.1); and 39% were female. Interventions were varied in their frequency and format (individual or group; computerised or non-computerised). Treatment duration ranged from five to 104 weeks. The study designs were not reported.

It appears that more than one reviewer was involved in the selection of studies.

Assessment of study quality
There was no reported formal assessment of study quality.

Data extraction
Data were extracted on the means and standard deviations of the neuropsychological test results, to enable the calculation of effect sizes and 95% confidence intervals. Statistical parameters (t and F values) were used, where means and standard deviations were not available.

Two reviewers independently extracted the data, and the reliability of this process was checked.

Methods of synthesis
Effect sizes were pooled in a fixed-effect meta-analysis, and 95% confidence intervals were presented. The effect sizes were classified as small (0.2), medium (0.5), or large (0.8). Cochran's Q was used to assess statistical heterogeneity. Where this was detected, the analysis was repeated using a random-effects model, with outliers excluded.

Subgroup analyses were conducted to explore whether the number of affective cases influenced the outcomes: where studies included unipolar and bipolar cases, the effect size was weighted for the percentage of affective disorder cases; for randomised trials with schizoaffective and schizophrenia only, effect sizes were weighted for the proportion with...
schizoaffective disorder. The influence of the diagnostic mix (schizoaffective and affective combined) was explored in analysis of the correlation between the effect size and the proportion of affective cases (with mean age, gender, and treatment duration as covariates).

Publication bias was assessed in a funnel plot, and with Rosenthal's file drawer method.

**Results of the review**

Twenty-one studies, with 940 patients (range nine to 131) were included in the review. Eighteen studies (881 patients) were included in the meta-analysis. The authors referred to methodological weaknesses in the included randomised controlled trials, but no further details were reported.

The effect sizes ranged from -0.16 to 0.66. Most studies indicated low or low-to-medium improvements in cognitive functioning following their intervention. The pooled effect size significantly favoured the intervention (0.31, 95% CI 0.24 to 0.37; 18 studies; significant heterogeneity p<0.01). Due to the heterogeneity, the analysis was repeated after excluding two outlying studies. The result remained significant in favour of the intervention (0.32, 95% CI 0.20 to 0.43; 16 studies). It appears that publication bias was not a substantial threat.

Subgroup analyses showed that the pooled effect, weighted for the proportion of affective cases with unipolar or bipolar disorder, remained significant at 0.44 (95% CI 0.28 to 0.59; seven studies; no significant heterogeneity). The pooled effect, weighted for the proportion of patients with schizoaffective disorder, in studies of patients with schizoaffective disorder or schizophrenia, was 0.41 (95% CI 0.30 to 0.51; six studies; no significant heterogeneity). There was a significant positive correlation between the effect size for cognitive functioning and the total proportion of cases with schizoaffective and affective disorders, and statistical significance remained when the analysis was controlled for covariates.

**Authors' conclusions**

There was preliminary evidence to support the use of cognitive remediation to improve short-term cognitive functioning in patients with schizoaffective and affective disorders.

**CRD commentary**

The review question was clear and the inclusion criteria were sufficient to enable replication. A number of relevant sources were searched to locate published and unpublished studies, but only published studies in English were included, and this was not explained. The processes of study selection and data extraction appear to have included attempts to minimise error and bias. The study designs were not reported and the absence of a formal quality assessment, limits the interpretation of the reliability of the review findings. Some study details were presented. Clear evidence of clinical and statistical heterogeneity across the studies means that a fixed-effect meta-analysis might not have been appropriate, but some potential moderating factors were explored.

The authors came to a cautious conclusion, which seems to be appropriate, but the reliability of the review may be limited by some of the weaknesses in the methods.

**Implications of the review for practice and research**

**Practice:** The authors stated that it might be relevant to examine the addition of cognitive remediation to other psychological therapies, such as psycho-education or cognitive-behavioural therapy, for patients with more difficult problems.

**Research:** The authors stated that studies should examine the long-term effects of cognitive remediation for patients with affective disorders. Research should examine if changes in cognitive deficits lead to improvements in symptoms or functioning, and if these changes are different from those in patients with schizophrenia.

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