Cognitive rehabilitation in schizophrenia: a quantitative analysis of controlled studies

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CRD summary
This review assessed the effect of cognitive rehabilitation in schizophrenia on performance tasks. The authors concluded that cognitive remediation had the potential to improve performance. Given the lack of details about the patient population and methodology, the reliability of the conclusion is uncertain and should be treated with caution.

Authors' objectives
To quantitatively review the controlled studies on cognitive rehabilitation in schizophrenia for the effect of training on performance for tasks other than those practised in the training procedure.

Searching
MEDLINE and PsycLIT were searched from 1980 to August 2001; the search terms were reported. The reference lists of recent reviews were checked, and abstracts presented at the International Congress on Schizophrenia Research (1999 and 2001) were also searched. Only articles published in peer-reviewed English language journals were eligible for inclusion.

Study selection
Study designs of evaluations included in the review
Studies where cognitive remediation was compared with a placebo, another intervention, or standard treatment, were eligible for inclusion. Parallel and crossover designs were eligible for inclusion.

Specific interventions included in the review
Studies of cognitive remediation that involved practising or learning cognitive skills in individual or group formats, where the intervention was not limited to one cognitive task, and included training methods that were different from the tests used to measure the outcome, were eligible for inclusion. In addition, cognitive remediation had to be compared with a placebo, another intervention, or standard treatment. Studies evaluating the impact of operant behavioural techniques were excluded, except when behavioural reinforcement was combined with cognitive remediation.

The interventions evaluated in the included studies were of strategy or rehearsal training. Comparisons were made with standard care, performing tasks, work therapy, games, videos, handicrafts, support group, leisure group, or occupational therapy. The number of sessions ranged from 1 to 78.

Participants included in the review
Studies of people with schizophrenia were eligible for inclusion.

Outcomes assessed in the review
No specific inclusion criteria for the outcomes were reported. The outcome reported in the review was task performance.

How were decisions on the relevance of primary studies made?
The authors did not state how the papers were selected for the review, or how many reviewers performed the selection.

Assessment of study quality
The authors did not state that they assessed validity.
Data extraction
The authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction. Data were extracted on study design and training intervention.

The standardised mean difference (SMD) was calculated for individual studies. Where the mean and standard deviation were not available, Cohen's d-values were calculated. These were calculated either by dividing the difference between intervention and control means by the pooled standard deviation, or from P-, t- or F-values, or from treatment-control group differences at baseline and end point, where the first d-value was subtracted from the latter.

Methods of synthesis
How were the studies combined?
When multiple tests were reported, Cohen's d-values were combined into one d-value. The pooled SMD and 95% confidence intervals (CIs) were calculated using a random-effects model. The authors stated that a Cohen's d of 20 is considered a small effect and a Cohen's d of 80 is considered a large effect, and used these guidelines to evaluate their SMD.

How were differences between studies investigated?
Heterogeneity was assessed using the Q-statistic, with studies weighted on variance. Separate analyses were performed to determine the effects of rehabilitation approach and duration of training, with the QB statistic used to investigate whether there was a significant difference between groups in terms of the SMD.

Results of the review
Twelve studies (n=543) were included in the review: 10 randomised controlled trials (RCTs, n=503), one non-randomised controlled trial (n=30) and one matched control trial (n=10).

Training resulted in a medium effect on task performance, with a pooled SMD of 0.45 (95% CI: 0.26, 0.64) and no significant statistical heterogeneity (QW=14.3, P=0.43). Training of less than 15 sessions resulted in a medium effect on task performance, with a pooled SMD of 0.44 (95% CI: 0.01, 0.85). Training of 15 sessions or more resulted in a medium effect on task performance, with a pooled SMD of 0.45 (95% CI: 0.18, 0.85). There was no significant difference between the groups (QB=0.001, P=0.978). Rehearsal training resulted in a low-to-medium effect on task performance, with a pooled SMD of 0.34 (95% CI: 0.03, 0.70). Strategy training resulted in a medium effect on task performance, with a pooled SMD of 0.52 (95% CI: 0.25, 0.78). There was no significant difference between the groups (QB=0.95, P=0.36).

Authors' conclusions
Cognitive remediation has the potential to improve performance on tasks other than those used in the training procedure.

CRD commentary
The review question and the inclusion criteria were clearly stated. Two relevant electronic databases and other sources were searched. However, only published articles in English were included, which might have led to publication bias and some studies being missed. The authors did not report details of how the study selection and data extraction processes were carried out, thus it is unclear whether attempts were made to minimise error and bias. The authors did not report a systematic validity assessment of the studies, but they did state whether the participants of the included studies were randomised.

It was unclear whether it was appropriate to pool the included studies, as there were no details of the patient population, and therefore, it was not possible to assess the studies for clinical heterogeneity. In addition, statistical heterogeneity was not assessed in the subgroup analyses. These factors, along with the lack of methodological detail, mean that the results of the review should be treated with caution. The authors' conservative conclusions appear appropriate given the evidence presented.
Implications of the review for practice and research
Practice: The authors did not state any implications for practice.

Research: The authors stated that more research is needed to confirm their findings, and that future studies should include more real-world outcomes and perform longitudinal measurements. They also stated that future studies on the effects of cognitive training on patterns of brain activation may yield insight into the nature of training effects in schizophrenia.

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