



AOTA Evidence Briefs

Older Adults

**A product of the American Occupational Therapy Association's Evidence-Based Literature Review Project*

OA#11

Cognitive remediation may improve the cognitive performance of patients with schizophrenia

Wykes, T., Reeder, C., Corner, J., Williams, C., & Everitt, B. (1999). The effects of neurocognitive remediation on executive processing in patients with schizophrenia. *Schizophrenia Bulletin*, 25, 291–307.

Level: IIB2c

Nonrandomized control trial, two groups, less than 20 participants per condition, moderate internal validity, low external validity

Why research this topic?

Patients with schizophrenia experience cognitive deficits, most commonly reductions in executive functioning (i.e., how they control and process information). Evidence indicates that these deficits affect patients' social functioning. Researchers have studied the effectiveness of cognitive remediation in diminishing the deficits and thereby improving social functioning, but they have not yet isolated the variables that contribute to positive results.

Although approaches to cognitive remediation vary, this form of intense therapy is concerned with improving memory, attention, and concentration (Centre for Evidence-Based Mental Health, 2001).

What did the researchers do?

Wykes and his colleagues (1999), all affiliated with the Institute of Psychiatry (London), compared the effectiveness of cognitive remediation with that of intensive occupational therapy in reducing deficits and improving social functioning. They recruited participants for their study from community psychiatric clinics serving an area in South London. To be eligible, patients had to have a diagnosis of schizophrenia and show evidence of cognitive problems and problems with social functioning. Thirty-three patients met the criteria. Twenty-five were men, 8 were women. Their average age was 38.5 years.

The researchers randomly assigned the participants to one of two treatment groups: cognitive remediation or intensive occupational therapy. The cognitive remediation group was trained using three modules: cognitive flexibility, working memory, and planning. The modules consisted of tasks ranging from extremely easy to easy, assuring the participants of error-free learning. During the cognitive flexibility module, the participants practiced engagement, disengagement, and re-engagement activities. For example, participants practiced alternatively crossing off even or odd numbers, depending on therapist instruction. During the working memory module, participants practiced simultaneously maintaining and transforming two sets of information. For example, participants recall the number of objects in a series of lines. However, they were asked to transform this information by recalling lines in different orders (i.e., begin by recalling objects in line three rather than line one). During the planning module the participants practiced planning a series of steps to reach a goal. The training was offered 1 hour a day for 40 days. The participants were encouraged to attend at least 3 days a week and preferably 5. The intensive occupational therapy group engaged in occupational therapy activities frequently offered in a psychiatric setting, such as relaxation, assertiveness training, comprehension of social information, life diary, and role-playing.

The outcome areas of interest were as follows:

- *Cognitive performance*, specifically *cognitive flexibility* (as measured or indicated by the Hayling Sentence Completion Task, Trails A and B of the Halstead-Reitan battery, response inhibition, the Controlled Oral Word Fluency Test, the Stroop Neuropsychological Screening Test, and the Wisconsin Card Sorting Test); *working memory* (as measured by a test of participants' ability "to reproduce from memory increasingly complex figures presented on a grid" (p. 294), a test of participants' ability to "recall the last word in each sentence" after hearing a group of sentences, the Digit Span subtest of the Wechsler Adult Intelligence Scale–Revised, and a test of participants' ability to carry out a visual task and a verbal task at the same time); and *planning* (as measured by the Tower of London task and a six-element modification of the Shallice and Burgess test).
- *Symptoms and social functioning* (as measured by the Social Behaviour Schedule, the Present State Examination, the Brief Psychiatric Rating Scale, and the Rosenberg Self-Esteem Schedule).

Measurements were taken before treatment began, after treatment ended, and 6 months after treatment ended.

What did the researchers find?

The two groups together showed **significant** (see *Glossary*) improvement in cognitive flexibility as measured by four of the six tests, in working memory as measured by one of the four tests, in planning as measured by one of the two tests, and in symptoms and social functioning as measured by one of the four tests.

Significant treatment effects were present for the cognitive remediation group over the intensive occupational therapy group in cognitive performance as measured by the Wisconsin Card Sorting Test, the Digit Span subtest, and the six-element modification; and in symptoms and social functioning as measured by the Rosenberg Self-Esteem Schedule.

Significantly more participants in the cognitive remediation group than in the intensive occupational therapy group showed improvement in cognitive flexibility and working memory.

Cognitive remediation had no generalized effect on social functioning, but results suggested that changes in social functioning might occur after attainment of a threshold in cognitive performance.

What do the findings mean?

For therapists and other providers, the findings suggest that cognitive remediation may be effective for improving self-esteem in patients with schizophrenia. It may also produce slight, short-term improvements in cognitive flexibility and working memory. However, cognitive remediation does not appear to benefit social functioning or symptoms.

What are the study's limitations?

The study has several limitations. First, the sample may not be large enough to detect statistically significant or clinically important differences between groups. Second, not all evaluators were **blind** (see *Glossary*) to group assignments, and this may have unconsciously influenced group assessments. Last, both intervention groups were receiving medications and additional treatments (outpatient and residential services) that may have influenced the results of the study.

Reference

Centre for Evidence-Based Mental Health. (2001). Evidence-based treatment summaries: Cognitive remediation. Retrieved September 26, 2003 from <http://cebmh.warne.ox.ac.uk/cebmh/elmh/nelmh/schizophrenia/treatment/talking/cogremediation2.html>

Glossary

blinded/blinding—Blinding refers to the practice of keeping members of the research study unaware of which group a participant is assigned to (treatment or control) in the study. Single blinding usually refers to keeping study participants unaware of whether they are receiving the experimental or the sham treatment. Double blinding usually refers to keeping the participants and those who are administering the treatment unaware of who is receiving the experimental and who is receiving the sham treatments. In some cases, where it is impossible to blind those administering treatment, the individuals who are administering the outcome measures can be blinded to group status.

Studies in which blinding does not occur can have significant biases. When the participants know that they are receiving the experimental treatment, they often get better because they think they ought to (this is often referred to as the placebo effect). When researchers know that a participant is receiving the experimental treatment, they often subconsciously favor those participants when evaluating them on outcome measures. For instance, when timing a participant in the treatment group, researchers may unknowingly stop the watch a little faster or slower so the treatment participant seems to do better.

significance (or significant)—A statistical term, this refers to the probability that the results obtained in the study are not due to chance, but to some other factor (such as the treatment of interest). A significant result is one that is likely to be generalizable to populations outside the study.

Significance should not be confused with clinical effect. A study can be statistically significant without having a very large clinical effect on the sample. For example, a study that examines the effect of a treatment on a client's ability to walk may report that the participants in the treatment group were able to walk significantly longer distances than the control. However, if you read the study you may find that the treatment group was able to walk, on average, 6 feet, while the control group was able to walk, on average, 5 feet. While the outcome may be statistically significant, a clinician may not feel that a 1-foot increase will make his or her client functional.

■ Terminology used in this document is based on two systems of classification current at the time the evidence-based literature reviews were completed: *Uniform Terminology for Occupational Therapy Practice—Third Edition* (AOTA, 1994) and *International Classification of Functioning, Disability and Health (ICIDH-2)* (World Health Organization [WHO], 1999). More recently, the *Uniform Terminology* document was replaced by *Occupational Therapy Practice Framework: Domain and Process* (AOTA, 2002), and modifications to *ICIDH-2* were finalized in the *International Classification of Functioning, Disability and Health* (WHO, 2001).

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For more information about the Evidence-Based Literature Review Project, contact the Practice Department at the American Occupational Therapy Association, 301-652-6611, x 2040.



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