



AOTA Critically Appraised Topics and Papers Series
Traumatic Brain Injury

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

CRITICALLY APPRAISED PAPER (CAP)

Focused Question

What is the evidence for the effect of interventions to address cognitive/perceptual functions (attention, memory, executive functions) on the occupational performance for persons with traumatic brain injury (TBI)?

Freeman, M. R., Mittenberg, W., Dicowden, M., & Bat-ami, M. (1992). Executive and compensatory memory retraining in traumatic brain injury. *Brain Injury*, 6, 65–70.

PROBLEM STATEMENT (JUSTIFICATION OF THE NEED FOR THE STUDY)

State the problem the authors are investigating in this study.

Memory deficits are the most common sequelae of traumatic brain injury (TBI). However, there are few treatment outcome studies that examine the effectiveness of cognitive remediation, in general, or memory retraining, in particular. The studies that exist are not systematic, controlled empirical investigations. Improvement on neuropsychological batteries may say nothing about improved day-to-day functioning of the patient with TBI. Studies assessing improvement on tasks closely resembling those necessary for daily living are needed in order to test the usefulness of a program.

RESEARCH OBJECTIVE(S)

List study objectives.

The purpose of this study was to investigate the efficacy of memory retraining in patients with TBI using executive and compensatory memory retraining strategies.

Describe how the research objectives address the focused question.

This study addresses the areas of memory and executive function. The outcome, however, is not reported in terms of occupational performance.

DESIGN TYPE:

Two group pretest–posttest design

Level of Evidence:

II

Limitations (appropriateness of study design):

Was the study design type appropriate for the knowledge level about this topic? *If no, explain.*

Yes

No

SAMPLE SELECTION

How were subjects selected to participate? Please describe.

The article simply says that participants were selected from the population of a particular center.

Inclusion Criteria

Documented head trauma accompanied by identified cognitive deficits

Exclusion Criteria

Premorbid history of neurological or psychiatric disturbance

Sample Selection Biases: *If yes, explain.*

Volunteers/Referrals

Yes 6 participants were referred for cognitive rehabilitation and assigned to the treatment group; the other 6 participants were referred for neuropsychological testing and assigned to the no treatment group.

No

Attention

Yes

No

Others (list and explain):

SAMPLE CHARACTERISTICS

N =12; mean age: treatment group = 38.5 years, control = 47.8 years ([t (10) = -1.11, p >0.05])

% Dropouts

(%) Male

(%) Female

Ethnicity

Disease/disability diagnosis

Check appropriate group:

<20/study group <input checked="" type="checkbox"/>	20–50/study group	51–100/study group	101–149/study group	150–200/study group
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Sample Characteristics Bias: If no, explain.

If there is more than one study group, was there a similarity between the groups?

Yes Matched on severity of cognitive impairment using the Wechsler Adult Intelligence Scale – Revised (WAIS-R) and the pretest memory scores. WAIS: [t (10) = -0.65, P>0.05]. Memory: [t (10) = -0.70, p > 0.05].

No Treatment group was significantly more chronic. Time since injury: treatment group mean = 33.33 months, control group mean = 11.83 months (t (10) = 3.29, P = 0.009)

Were the reasons for the dropouts reported?

Yes

No

INTERVENTION(S)—Included are only those interventions relevant to answering the evidence-based question.

Add groups if necessary

Group 1 Treatment

Brief Description	Memory remediation treatment including compensatory and executive training skills. Based on Diller & Ben-Yishay, which is the prototype of most programs in the United States, consisting of 7 modules completed over 6 months. One module was devoted to memory retraining, consisting of read-aloud paragraph retention (the experimental intervention). Treatment consisted of repeated presentation of various paragraphs spoken both by trainees and staff. Techniques to enhance paragraph retention included note taking in a memory notebook; self-monitoring skills designed to teach the listener to self-monitor to determine need for clarification and repetition and to request help if necessary; prompting from staff and trainees to “stop and think” to facilitate self-monitoring skills; patients restating presented material in their own words to facilitate meaningfulness and interaction with material and retention; using imagery corresponding to material to facilitate retention; staff and trainees encouraging and reinforcing continued interest and improvement; using other monitoring skills to identify material which is presented poorly in order to ask for clarification and repetition; and getting feedback from the patient and staff designed to evaluate how successfully the patient utilized a skill or why the patient did not utilize a skill.
Setting	Group format
Who Delivered?	Staff and trainees
Frequency?	6 hours/week (2 hours, 3x/week)
Duration?	2½ weeks

Group 2 Control

Brief Description	No treatment
Setting	
Who Delivered?	
Frequency?	
Duration?	2½ weeks

Intervention Biases: *Explain, if needed.*

Contamination

Yes

No

Co-intervention

Yes

No

Timing

Yes

No

Site

Yes

No

Use of different therapists to provide intervention

Yes

No

NR

MEASURES AND OUTCOMES—Included are measures relevant to answering the focused question.

Name of measure:

Paragraph Memory Task

Outcome(s) measured (what was measured?):

Memory: Retention of facts from a paragraph read aloud. Each paragraph had 2 secondary ideas, which comprised one main idea and four details. Each secondary idea reported = 30 points; each reported detail = 10 points. Total score = 100.

Is the measure reliable (as reported in article)?

Yes

No

NR

Is the measure valid (as reported in article)?

Yes

No

NR

How frequently was the measure used for each group in the study?

Pre- and post-paragraph (similar but not significantly different paragraphs as determined on 12 normal subjects [$t_{(11)} = -0.27, P > .05$], were used)

Measurement Biases

Were the evaluators blinded to treatment status? *If no, explain.*

Yes

No

NR

Recall or memory bias? *If yes, explain.*

The test was directed at memory.

Yes

No different paragraphs used in pre- and posttests; neither of these used in training

Others (list and explain):

Limitations (appropriateness of outcomes and measures) *If no, explain.*

Did the measures adequately measure the outcome(s)?

Yes very limited to specific training

No

RESULTS

List results of outcomes relevant to answering the focused question

Include statistical significance where appropriate ($p < 0.05$)

Include effect size if reported

Independent t test
Effect size not reported; calculated from data supplied.
There was a significant difference between groups at posttest ($t_{(10)} = 2.32, p = 0.02, r = .59$). The treatment group significantly improved memory scores compared to the control group.

Was this study adequately powered (large enough to show a difference)? *If no, explain.*

Yes

No

Were appropriate analytic methods used? *If no, explain.*

Yes

No

Were statistics appropriately reported (in written or table format)? *If no, explain.*

Yes

No

CONCLUSIONS

State the authors' conclusions that are applicable to answering the evidence-based question.

The results suggest that inclusion of memory retraining in cognitive remediation programs can improve memory function in patients with traumatic brain injury. Because participants in the treatment group were in chronic stage, the significant improvement can be attributed to the training rather than spontaneous recovery. The authors further concluded that the significant gains demonstrated will transfer to everyday living.

Were the conclusions appropriate for the study design (level of evidence)? *If no, explain.*

Yes —the first conclusion

No —the second conclusion; not tested in this study

Were the conclusions appropriate for the statistical results? *If no, explain.*

Yes

No

Were the conclusions appropriate given the study limitation and biases? *If no, explain.*

Yes

No

IMPLICATIONS FOR OCCUPATIONAL THERAPY

This section provides guidance about clinical practice, program development, and other implications of the study findings as they relate to the focused question.

Task-specific training was shown to cause improvement in the particular tasks that were included in the training in persons who had long-standing brain injury. However, whether that improvement generalizes to everyday tasks, as suggested by the authors, cannot be determined from this study, as it did not test that question.

This work is based on the evidence-based literature review completed by Catherine Trombly, ScD, OTR/L, FAOTA.

CAP Worksheet adapted from: Critical Review Form – Quantitative Studies ©Law, M., Stewart, D., Pollack, N., Letts, L., Bosch, J., & Westmorland, M., 1998, McMaster University. Used with permission.

For more information about the Evidence-Based Literature Review Project, contact the American Occupational Therapy Association, 301-652-6611, x 2052.



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