



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)?

Novack, T. A., Caldwell, S. G., Duke, L. W., Bergquist, T. F., & Gage, R. G. (1996). Focused versus unstructured intervention for attention deficits after traumatic brain injury. *Journal of Head Trauma Rehabilitation, 11*(3), 52–60.

PROBLEM STATEMENT (JUSTIFICATION OF THE NEED FOR THE STUDY)

State the problem the authors are investigating in this study.

Disruption of attentional skills is common after severe traumatic brain injury and a potential barrier to full participation in a rehabilitation program and community activities. Any means of expediting recovery of attention skills would improve the rehabilitation program and ultimate outcome. Several studies have approached remediation of attentional deficits in a controlled fashion. Based on available studies, treatment effects associated with remediation of attention are equivocal. When successful, cognitive remediation for attention has been applied in a systematic, hierarchical fashion. In contrast, studies that present isolated training activities with no logical progression in skill levels are more likely to obtain negative results.

RESEARCH OBJECTIVE(S)

List study objectives.

Compare the effects of a focused attention remediation program to an unstructured stimulation program on attentional skills among individuals undergoing acute rehabilitation after traumatic brain injury (TBI), with the expectation that the focused program will promote more extensive recovery. Examine functional recovery using the Functional Independence Measure (FIM) with the expectation that improved attentional skills resulting from the focused program will be associated with greater functional independence.

Describe how the research objectives address the focused question.

The study intends to examine the effectiveness of a particular therapy program on the functional independence of the participants.

DESIGN TYPE:

Matched pairs; randomized controlled trial

Level of Evidence:

I

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.

Inclusion Criteria

Ability to communicate in some fashion.

Exclusion Criteria

None

Sample Selection Biases: *If yes, explain.*

Volunteers/Referrals

Yes

No

Attention

Yes

No

Others (list and explain):

Subjects gathered over a 3-year period; the rehabilitation center and program (other than experimental program) may have differed over that time. The outcome measure of interest (FIM) was not introduced until midway through the project.

SAMPLE CHARACTERISTICS

44 out of 61 patients seen for cognitive rehabilitation were selected for matched pairs (matched on age, education, time since injury when remediation began, number of remediation sessions). Mean age ~ 27 yrs; mean education = 11.5 years; mean onset to intervention ~ 6 weeks; mean number of sessions received prior to selection ~ 20.5.

% 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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* The FIM (outcome measure of interest to this review) was introduced halfway through the study; therefore, data only available on 24/44 subjects, 12 in each group.

Sample Characteristics Bias: *If no, explain.*

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

Yes matched on 4 important variables

No

Were the reasons for the dropouts reported?

Yes did not meet matching criteria. These 17 people did not differ from the 44 test subjects except for matching variables. The FIM was introduced at the facility halfway through the project.

No

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

Add groups if necessary

Group 1 Experimental: Focused Stimulation Program

Brief Description	Individual treatment. Participants were screened for level of attentional skill, and treatment was conceptualized on the hierarchy of attentional skills described by Sohlberg and Mateer ¹ . The beginning level of treatment for each patient was the highest level in which at least 40% accuracy was achieved on screening. To progress to more complex tasks, the participant had to achieve 80% accuracy on 2 consecutive trials or perform within specified limits on 2 consecutive trials or no more than 2 errors on a discriminative task. Computer-based programs were used with therapist intervention to improve performance, with gradual withdrawal of cues.
Setting	NR
Who Delivered?	Master's degree level educator and psychometrician
Frequency?	30 min, 5 days per week
Duration?	1–15 weeks

Group 2 Control: Unstructured Stimulation Program

Brief Description	Individual treatment; atheoretical; tasks generally focused on memory or reasoning skills and were not presented in a hierarchical or sequential fashion. Tasks included orientation questions, games, and verbal reasoning tasks such as categorization, similarities, and cause/effect relations. Emphasis was on language-based tasks. Also included computer games involving memory and/or reasoning.
Setting	NR
Who Delivered?	Master's degree level educator and psychometrician
Frequency?	30 min, 5 days per week
Duration?	1–15 weeks

Intervention Biases: *Explain, if needed.*

Contamination

Yes

No

NR

¹ Sohlberg, M. M., & Mateer, C. A. (1987). Effectiveness of an attention-training program. *Journal of Clinical and Experimental Neuropsychology*, 9, 117–130.

Co-intervention

Yes

No

NR assume the patient was enrolled in all other rehabilitation services

Timing

Yes

No

NR

Site

Yes

No

NR

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 of interest:

FIM (available for 24 of 44 patients)

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

Independence in activities of daily living

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?

Twice: admission and discharge

Measurement Biases

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

Yes

No

NR

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

Yes

No unlikely that the participants could have remembered—they were unstable for many of the neuropsychological tests at admission.

NR

Others (list and explain):

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

Did the measures adequately measure the outcome(s)?

Yes

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

There was no significant difference between groups at admission or at discharge. There was a significant effect for time ($F_{(7,36)} = 14.21, p < .0001$) because the participants performed significantly better at discharge than at admission. This was true for all scores, including the FIM. (Spontaneous recovery is suspected.)

There was no significant difference between groups on either the motor or cognitive subtests of the FIM at admission or at discharge. Participants made an average of a 30-point improvement in the motor portion of the FIM and a 10-point improvement on the cognitive portion of the FIM over the treatment period.

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

Yes

No Unknown; could not calculate effect sizes from data supplied.

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

Yes

No

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

Yes

No few actual statistical tests were reported. No focused tests (that allow calculation of effect size) were reported.

CONCLUSIONS

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

Results of the study indicate that focused remediation is no more effective than unstructured stimulation in improving the attentional skills of individuals undergoing acute rehabilitation following severe TBI. Both groups improved significantly. There was no difference in neuropsychological functioning at discharge or in functional outcomes measured by the FIM.

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

Yes

No

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.

This study offers no guidance for therapy because the effects seen may be accounted for by spontaneous recovery. It does indicate that patients with severe TBI can improve in their activities of daily living, although we do not know whether that was due to spontaneous recovery or to the assistance of rehabilitation since there was no no-treatment group.

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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