



## 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 (published between 2000-2004) to enable persons with traumatic brain injury (TBI) to participate in areas of occupation (activities of daily living [ADL], instrumental activities of daily living [IADL], work, leisure, social participation, and education)?**

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Trombly, C. A., Radomski, M. V., Trexel, C., & Burnett-Smith, S. E. (2002). Occupational therapy and achievement of self-identified goals by adults with acquired brain injury: Phase II. *American Journal of Occupational Therapy*, 56, 489–498.

#### **PROBLEM STATEMENT (JUSTIFICATION OF THE NEED FOR THE STUDY)**

- The effectiveness of the various components of rehabilitation has not been differentiated.
- The value of occupational therapy to effect positive changes on disability and handicap for persons with TBI needs to be demonstrated.
- Current evidence of effect of occupational therapy on disability and handicap is limited to case reports.
- Current higher level evidence focuses on impairment level without relating gains made to improvement in activity or participation.
- The authors' previous study of 16 persons with mild to moderate TBI, using a repeated measures design, indicated that occupational performance improved significantly during the treatment phase for both the acute and chronic stage participants, but there were no changes during the no-treatment phase.

State the problem the authors are investigating in this study.

The purpose of the current study was to replicate the previous study at two additional centers and with a new cohort of participants from the original center to provide robust evidence that goal-specific outpatient occupational therapy is strongly and significantly associated with restoration of valued occupational performance goals and reduction of disability in young adults with mild to moderate acquired brain injury.

## RESEARCH OBJECTIVE(S)

List study objectives.

The hypotheses were:

- Adults with acquired brain injury who participate in goal-specific outpatient occupational therapy will improve significantly in self-identified goals related to activities and tasks of daily life.
- Adults with acquired brain injury will rate their performance and satisfaction with performance of targeted activities significantly higher after a period of goal-specific outpatient occupational therapy compared with a no-treatment period.
- Adults with acquired brain injury will rate their performance on a measure of handicap (participation) significantly higher after a period of outpatient occupational therapy compared to a no-treatment period.

Describe how the research objectives address the focused question.

The research objectives directly relate to the focused question.

## DESIGN TYPE:

Repeated measures design (participants act as their own controls in a treatment–no-treatment design)

## Level of Evidence:

Level III

## 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.

All patients referred for occupational therapy at three sites located in various sections of the United States who met the criteria, were recruited for the study.

## Inclusion Criteria

- Documented TBI
- Level IV or higher on the Rancho Cognitive Scale
- Competent to give informed consent

**Exclusion Criteria**

- Severe behavioral problems
- Current substance abuse
- Previous head injury
- Concurrent neurological or psychiatric disorder
- Lack of self-awareness (unaware of problems related to occupational performance tasks)

**Sample Selection Biases:** *If yes, explain.*

Volunteers/Referrals

Yes

No

Attention

Yes

No

Others (list and explain):

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**SAMPLE CHARACTERISTICS**

N= 41 → 31

% Dropouts

#/ (%) Male

#/ (%) Female

Ethnicity

Disease/disability diagnosis

NR = Not reported.

Check appropriate group:

<20/study group	20–50/study group <input checked="" type="checkbox"/>	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

No  All participants received occupational therapy; however, each center used its own particular protocol. Participants from Center 3 were significantly less chronic (3 months postinjury) than those at the other 2 centers.

Were the reasons for the dropouts reported?

Yes  8 were dropped from the study because they self-discharged from therapy after less than 1 week without warning; data from 2 were lost due to researcher error

No

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

*Add groups if necessary*

*NOTE:* All participants received outpatient occupational therapy focused on training in the use of compensatory strategies and environmental adaptation, the independent variable in this study. However, each center used its own usual protocol.

Group 1 Site 1

Brief Description	Training in compensatory skills for deficits in instrumental activities of daily living (IADL; laundry, meal preparation, scheduling events and appointments, etc.) and cognition and metacognition (activities to improve attention, problem solving, set up and use of a memory notebook system, simulated work tasks to rehearse cognitive skills, etc.)
Setting	Rehabilitation institute in the midwestern United States
Who Delivered?	Occupational therapists
Frequency?	Mean of 12.9 hours; significantly fewer hours of treatment than the other 2 sites; mean of 24.5 treatments
Duration?	Mean of 13.7 weeks treatment; 5.8 weeks no treatment

Group 2 Site 2

Brief Description	Program of classes to facilitate assimilation into the college community, including adapted computer technology, problem solving of common problems of persons with TBI, independent living skills, and organizational strategies (IADL such as budgeting, assertiveness and advocacy, how to use campus resources, how to find one's way using a map, use of bus transportation, time management, etc.)
Setting	2-year college in southwestern United States
Who Delivered?	Occupational therapists
Frequency?	Mean of 84.2 hours; mean of 63 treatments
Duration?	Mean of 20.9 weeks treatment (one semester); 19.6 weeks of no treatment

Group 3 Site 3

Brief Description	Independent living skills (homemaking; money management; self-care and nutrition; community locomotion as a pedestrian, bus user, or driver), compensatory time-use planning, compensation for visual deficits or visual processing deficits
Setting	Outpatient program that was an extension of the inpatient program at a rehabilitation facility in northwestern United States
Who Delivered?	Occupational therapists
Frequency?	53.1 mean hours, mean of 49.9 treatments
Duration?	Mean of 12.3 weeks; 9.9 weeks no treatment

Intervention Biases: Explain, if needed.

Contamination

Yes

No

Co-intervention

Yes

No  Participants received other therapies directed at non-occupational therapy goals

Timing

Yes

No

Site

Yes

No  3 sites were used, but participants acted as their own controls and the results from each site were studied separately, then combined metaanalytically

Use of different therapists to provide intervention

Yes  Each participant was assigned a particular therapist according to the assignment procedures of the institution

No

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

Name of measure:

Canadian Occupational Performance Measure (COPM)

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

The participant's perceived estimate of performance of occupational tasks identified as problems and the participant's satisfaction with perceived performance of the tasks.

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?

At intake, at end of treatment, at end of no-treatment period (by phone)

Name of measure:

Community Integration Questionnaire (CIQ)

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

Handicap (participation); status of home and social integration and productive activity

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?

At intake, at end of treatment, at end of no-treatment period (by phone)

Name of measure:

Goal Attainment Scaling (GAS)

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

Progress in achieving targeted goals

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?

The GAS scales were prepared at the beginning of treatment; outcome measured at the end of treatment.

### Measurement Biases

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

Yes

No  Each treating therapist administered the outcome measures to his or her own patient.

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

Yes

No

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

The total number of goals identified by all participants was 149, 81% of which were achieved. All participants, except one, achieved at least one goal. Fifteen participants achieved 100% of goals, 11 achieved 80% of goals, and 2 achieved 60%. The improvement in GAS scores from admission to discharge was significant ( $Z = 7.52, P < .001$ ), combined effect size:  $r = .94$ .

Significant differences were found in gain scores for the COPM-Performance ( $Z = 4.13$ ,  $P < .001$ ) and COPM-Satisfaction ( $Z = 4.25$ ,  $p < .001$ ) between the treatment and no-treatment periods, with the greater improvement occurring during the treatment periods and no improvement occurring during the no-treatment period. The combined effect sizes were  $r = .71$ ,  $.76$  respectively.

The gain scores of nontargeted community and home integration skills measured by the CIQ were not significantly different between treatment and no-treatment periods ( $Z = .75$ ,  $P = .22$ ,  $r = .29$ ).

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 major findings of the first study (Phase I) were confirmed by this study. That is, participants in a goal-specific program of outpatient occupational therapy, as represented by these sites, significantly improved during the treatment period in (a) achievement of self-identified goals (Phase I:  $r = .93$ ; Phase II:  $r = .91$ ), (b) perception of ability to perform targeted behaviors (Phase I:  $r = .69$ ; Phase II:  $r = .84$ ), and (c) satisfaction with performance of those tasks (Phase I:  $r = .78$ ; Phase II:  $r = .89$ ). As in the first study, the scores of perception of performance, satisfaction with performance, and community skills were sustained during the no-treatment period, but little further improvement occurred spontaneously after discharge from therapy. The lack of significant improvements during the no-treatment period suggests that occupational therapy effectively facilitated the improvements that occurred during the treatment period.

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.

The implication stated by the authors was: “Occupational therapy directed at specific goals valued by the client and using training of compensatory strategies as intervention is likely to result in achievement of targeted goals.” (p. 496). The interventions used by the therapists at the three sites were different, but all were aimed at targeted goals identified by the client in collaboration with the occupational therapist. The results (effect sizes) indicate a strong relationship between independent variable (occupational therapy) and outcome.

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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