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)?

Paniak, C., Toller-Lobe, G., Durand, A., & Nagy, J. (1998). A randomized trial of two treatments for mild traumatic brain injury. *Brain Injury, 12,* 1011–1023.

PROBLEM STATEMENT (JUSTIFICATION OF THE NEED FOR THE STUDY)
State the problem the authors are investigating in this study.

Mild traumatic brain injury (MTBI) accounts for approximately 80% of traumatic brain injury (TBI) cases. Most survivors recover within days or, at most, months after injury. Still, given MTBI's high incidence and the initial period of possible disability, the cumulative human and financial burden is considerable. The need for effective MTBI treatment is apparent. Early educational intervention given soon after injury, along with intensive assessment and treatment, has been found in noncontrol group studies to be effective. Only one study comparing different types of treatment for MTBI has been done. Given this shortage of empirical evidence, it remains uncertain if the relatively intensive treatment is necessary. The present study addressed this question.

RESEARCH OBJECTIVE(S)
List study objectives.

Determine whether extensive treatment (treatment-as-needed) was significantly more effective than a single session of educational and emotionally reassuring intervention.

Describe how the research objectives address the focused question.

Outcome of this cognitive treatment study was measured in terms of community integration as well as other assessments.

DESIGN TYPE:

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.

Drawn from consecutive admissions to 2 hospital emergency wards. Chosen by nurses if patients met the 1993 criteria for MTBI. Potential participants were contacted by phone and letter to see whether they wanted to take part in the study. If interested, the participant telephoned the principal investigator (PI) who did a more exacting interview.

Inclusion Criteria

NR

NR = Not reported.

Exclusion Criteria

History of inpatient treatment for psychiatric disorder; diagnosis of mental retardation; inability to read fluently in English; history of TBI more severe than MTBI in any time of life; a MTBI within 1 year prior to study; any ongoing central nervous system disorder; concurrently pregnant.

Sample Selection Biases: *If yes*, e*xplain.*

Volunteers/Referrals

Yes	✓
No	

Attention

Yes	
No	✓

Others (list and explain):

SAMPLE CHARACTERISTICS

N = 119; mean age = 32.7 for single session (SS) and 33.6 for treatment-as-needed (TAN); education (years = 13.7 for SS and 14.1 for TAN)

% Dropouts	6%		
# (%) Male	52 (47%)	#/ (%) Female	59 (53%)
Ethnicity	NR		
Disease/disability diagnosis	MTBI, diagnosed according to the American Congress of Rehabilitation's 1993 definition		

Check appropriate group:

<20/study group	20–50/study group	51–100/study group ✓	101–149/study group	150–200/study group

Sample Characteristics Bias: *If no*, e*xplain.*

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

Yes	There were no statistically significant differences (P < 0.05) between groups on any potentially confounding variable.
No	

Were the reasons for the dropouts reported?

Yes	
No	✓ the 8 did not differ significantly from those who remained in the study and those who remained did not differ significantly between groups

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

Participants were randomly assigned to one of two interventions. Met with the principal investigator within 3 weeks of injury (mean = 12 days).

Add groups if necessary

Group 1: SS treatment, *N* = 58

Brief Description	Aim was to legitimize the participants' experience as being "real," educate them regarding common complaints following MTBI, provide suggestions regarding coping with common problems, and provide reassurance of a good outcome. Participant met with the PI and discussed any concerns about head injury. They also read the National head Injury Foundations' *Minor Head Injury* brochure and discussed any comments or questions.
Setting	NR
Who Delivered?	Principal investigator
Frequency?	Once
Duration?	One time only

Group 2: TAN treatment, *N* = 53

Brief Description	The same treatment as SS, but also had a 3–4 hour neuropsychological and personality assessment and feedback, a consultation with a physical therapist, and further treatment-as-needed for MTBI complaints.
Setting	Outpatient head trauma program
Who Delivered?	Various professionals
Frequency?	Ad lib; according to diary kept by patients, median of 1 further visit (range 0–10) with neuropsychologist; 0 with physical therapist; and 0 (range 0–6) for telephone contacts.
Duration?	NR

Intervention Biases: *Explain, if needed.*

Contamination

Yes ☐

No ✓

Co-intervention

Yes ☐

No ✓

Timing

Yes ☐

No ✓

Site

Yes	
No	✓ probably not, but site for SS not reported.

Use of different therapists to provide intervention

Yes	✓ this was part of the difference between treatments
No	

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

Name of measure:

Community Integration Questionnaire (CIQ)

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

13 self-reported items regarding home, social role, or productive activity. Items are in multiple-choice format. Scores on questions for each factor are summed to obtain the domain score. The higher the score, the better the integration.

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?

Preintervention and at 3–4months after the baseline session

Name of measure:

Short Form–36 Health Survey (SF–36)

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

Multi-item self-rating scale assessing 8 health-related concepts (physical functioning, social functioning, role functioning—physical, bodily pain, mental health, role functioning-emotional, vitality, and general health perceptions). Results in two composite scores: mental component summary and physical component summary. Higher scores equal better health or less impact of health problems on functioning.

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?

By telephone at 3–4 month follow-up

Name of measure:

Problem Checklist (PLC)

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

43 items, each item being a common TBI complaint. Three factors in the instrument: affective/behavioral, cognitive, and physical/dependency. Each item had 2 responses: whether the participant is currently experiencing any problems and how much of a problem each experienced problem is with regard to daily functioning. Percentage of problems experienced = problem experience score; problem severity = average score for all the items on that factor.

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?

By telephone at 3–4 month follow-up

Measurement Biases

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

Yes	✓ unknown, but the questionnaires were administered by a research assistant who was not involved in any of the treatment
No	

Recall or memory bias *If yes, explain.*

Yes	✓ possibly, but unlikely to remember answers after 3–4 months
No	

Others (list and explain):

The participants may have been injured too recently to realize their problems in integration and answered the CIQ questionnaire (by phone) in terms of what they could or did do before the injury rather than what they were doing presently.

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

A repeated measures MANOVA on the 3 CIQ scores failed to show a statistically significant effect for any of the factors: time ($F_{(3,107)} = 0.96$, $p > 0.05$); group ($F_{(3,107)} = 1.80$, $p > 0.05$); or group by time interaction ($F_{(3,107)} = 0.46$, $p > 0.05$). Repeated measures ANOVA on preinjury, baseline, and follow-up occupational status indicated a statistically significant effect for time ($F_{(2,108)} = 16.36$, $p < 0.001$), but not for treatment group ($F_{(1, 109)} = 0.46$, $p > 0.05$) or treatment by time interaction. The scores fell from preinjury to baseline, but recovered at 3 months and did not differ significantly from preinjury level. Mean number of days before return to full time preinjury vocational activity averaged 28.7 days and did not differ between groups ($t_{(109)} = -0.29$, $p > 0.05$).

SF–36: Statistically significant effect for time, but not group or time by group interaction.

PCL: Statistically significant effect for time, but not group or time by group interaction.

No significant difference between groups in satisfaction with treatment scores, rated on a 1–5 scale 1 month after first visit.

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.

These results indicate that, when applied within 3 weeks of MTBI, a brief educational and reassurance-oriented intervention is just as effective and highly patient-rated as a potentially more intensive and expensive model patterned after treatment for more severe TBI. We cannot conclude that the brief SS intervention was more effective than no specialized treatment. The results suggest that future research for treatments applied soon after MTBI should focus more on refining early, brief treatments than researching more extensive and expensive rehabilitation models for all MTBI survivors.

Reviewer's comment: Neither group improved in community integration (occupational performance) as a result of either treatment. The researchers do not mention ceiling effects on the CIQ, which would indicate that the participants were already operating at full integration; therefore, one must conclude that these treatments may have addressed physical concerns of the participants but not community integration. Participants may have been injured too recently to realize their problems in integration and answered the questionnaire in terms of what they could and did do before the injury rather than what they were doing presently.

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 ✓ maybe not; the participants in the TAN group did not avail themselves of many other treatments beyond the first; therefore, the independent variable (amount and type of treatment) may be compromised (equalized between groups), leading to false conclusions. However, the TAN group did have the opportunity to call on whichever professional service they felt they needed and they did not.

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.

Neither group improved in community integration (occupational performance) as a result of these treatments. In light of this, occupational therapists should investigate what the minimal effective therapy is for patients with MTBI; document the improvements in occupational performance as a result of this therapy; and ascertain the profile of patients both who are satisfactorily helped to recover in all areas of their occupational performance by a brief engagement in occupational therapy and who require more therapy aimed at organizational and other executive skills that may be deficient secondary to MTBI.

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.