



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) WORKSHEET

Focused Question

What is the evidence for the effect of interventions to address psychosocial, behavioral, and social functions on the occupational performance for persons with traumatic brain injury (TBI)?

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Powell, J., Heslin, J., & Greenwood, R. (2002). Community based rehabilitation after severe traumatic brain injury: A randomized controlled trial. *Journal of Neurology, Neurosurgery, and Psychiatry*, 72, 193–202.

PROBLEM STATEMENT (JUSTIFICATION OF THE NEED FOR THE STUDY)

State the problem the authors are investigating in this study.

The current trend is toward shortening inpatient rehabilitation while enhancing the provision of community-based interventions. Evidence supports this for mild to moderately involved patients, but there is no good evidence of the effectiveness of this approach with patients with severe TBI.

RESEARCH OBJECTIVE(S)

List study objectives.

Evaluation of a multidisciplinary community-based outreach rehabilitation program for persons with severe traumatic brain injury (TBI). It was hypothesized that participants with severe traumatic brain injury randomized to a multidisciplinary community-based outreach program would make significantly greater gains in activities of daily living, social participation, and psychological well-being than those receiving only information about sources of existing help.

Describe how the research objectives address the focused question.

The objectives of the study directly address the focused question in that psychological and social functions are measured outcomes of the targeted intervention. Two occupational therapists were part of the 6.5 person team; the team leader was a clinical psychologist.

DESIGN TYPE:

Randomized controlled trial

Level of Evidence:

Level 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.

All patients who met inclusion criteria and for whom there were definable treatment goals after about 2 weeks of assessment at home were selected.

Inclusion Criteria

- Verified moderate to severe TBI (post traumatic amnesia [PTA] > 24 hours or other neurological evidence)
- Aged 16 to 65 years
- Lived within 1 hour travel time to the hospital
- Had long-term treatment goals agreed within the team as being amenable in principle to intervention

Exclusion Criteria

Concurrent neurological diagnosis

Sample Selection Biases: *If yes, explain.*

Volunteers/Referrals

Yes

No

Attention

Yes

No

Others (list and explain):

The participants and therapists were aware of the treatment condition. The assessor was blinded to patient assignment through the data entry stage of the study.

SAMPLE CHARACTERISTICS

N= 110 (54 in the outreach—experimental—group; 56 in the information only—control—group)

% Dropouts 11% in the experimental group; statistical tests of difference between the remaining groups on 22 demographic and all baseline scores were not significant, indicating that attrition probably did not affect results. Additionally, 13 experimental and 6 control participants were lost to analysis of main outcome measure due to unavailability of baseline measurement.

#/ (%) Male 71/75.5%

#/ (%) Female 23/24.5%

Ethnicity NR

Disease/disability diagnosis Moderate to severe TBI; mean time since onset was 1.3 years (range = 0.2–20.3 years) for the experimental group and 1.4 (range = 0.3–16.4 years) for the control group.

Check appropriate group:

<20/study group	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

No

Were the reasons for the dropouts reported?

Yes See above box Sample Characteristics % Dropouts

No

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

Add groups if necessary

Group 1

Brief Description	Programs were individualized. “A goal planning framework, ‘contracting organized goal setting,’ was developed within which long-term goals valued by the client and their careers and considered amenable to intervention by the team were worked towards via a series of written contracts which specified interim and short term goals achieved over 6–12 weeks” (p. 193). The methods used to work toward those goals were not reported.
Setting	Own home or other community setting (day center, colleges, work place)
Who Delivered?	The team, which was comprised of two occupational therapists, a physical therapist, a speech and language therapist, a clinical psychologist, and .5 of a social worker.
Frequency?	2–6 hours per week (seen twice weekly).
Duration?	An average of 27.3 (\pm 19.1) weeks.

Group 2

Brief Description	The participants were assessed and given some limited assistance with pursuing referrals to outpatient services.
Setting	Living at home
Who Delivered?	The team (as described above)
Frequency?	NR
Duration?	1 month immediately after discharge from inpatient rehabilitation

Intervention Biases: *Explain, if needed.*

Contamination

Yes

No NR; appears not to have occurred.

Co-intervention

Yes

No Possibly; the authors state that 6 patients in the outreach group received less than 6 weeks of treatment while some in the informational group undoubtedly received appropriate help from other sources (p. 201).

Timing

Yes The control group received less duration of treatment.

No

Site

Yes

No

Use of different therapists to provide intervention

Yes

No

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

Name of measure:

Brain Injury Community Rehabilitation Outcome-39 (BICRO-39)

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

Levels of activity, participation, and psychological aspects of functioning in the community. There are 6 subscales: personal care, mobility, self-organization (bill paying, medicine administration, etc.), socializing, productive employment (education, work, or child care), and psychological well-being, each scored on a 0 [with no help] to 5 [can't do at all] scale. A maximum gain index was calculated for each participant to identify the subscale on which the person showed the greatest improvement from intake to follow-up. They also calculated the total change score.

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; once at intake and once at follow-up, which occurred between 18 and 40 months postrandomization. The scale was completed by both the participant and the primary caregiver.

Name of measure:

Hospital Anxiety & Depression Scale (HADS)

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

A self-report of the intensity and frequency of 7 symptoms each of anxiety and depression experienced over the preceding week. Maximum score for each mood state is 21; scores of 10 or below fall within normal range.

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?

NR

Name of measure:

Barthel Index

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

Ability to undertake basic activities of daily living (grooming toileting, mobilizing, etc.). Maximum score of 20 indicates physical independence in basic self-care and mobility.

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: at intake by the assessing therapists and at follow-up by the research assessor.

Name of measure:

The Functional Independence/Assessment Measure (FIM + FAM)

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

Five subscales were used: personal care (7 items), mobility (7 items), communication (5 items), cognition functions (5 items) and psychological adjustment (4 items). Each item is scored between 1 and 7. Subscale scores were averaged rather than summed; thus, scores on each scale can range from 1 to 7, where 7 represents maximum independence and no disability. Total scale score (sum of scores on the 5 subscales) and maximum gain index (as for BICRO-39) were calculated.

Is the measure reliable (as reported in article)?

Yes

No Probably not in this situation, due to community setting and language differences.

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 (as for Barthel).

Measurement Biases

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

Yes

No

Recall or memory bias *If yes, explain.*

Yes

No Probably not

Others (list and explain):

Floor and ceiling effects for 70–75% of participants on personal care and productivity subscales.

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

Did the measures adequately measure the outcome(s)?

Yes Within the limitations of questionable reliability and floor and ceiling effects

No

RESULTS

Analysis was by intention-to-treat

List results of outcomes relevant to answering the focused question

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

Include effect size if reported

BICRO-39: 80% of the experimental group and 70% of the control group improved on the total score. Maximum gain index was 1.5 for the experimental group and 0.5 for the control group. Mann-Whitney U Test on ranked change scores: $U = 481$ (mean rank for outreach group = 44.3 vs. 32.5 for the information only group), $p < 0.05$. Total change score was significantly better for the outreach group vs. the control group. $U = 517$ (mean rank for the outreach group = 43.2 vs. 33.4 for the information only group), $p = 0.05$.

HADS: Most participants scored below clinical cut off values: 71% fell within normal range for anxiety and 65% for depression. The two groups did not differ in extent of change from intake to follow-up for either mood state.

Barthel: 60% of participants scored at ceiling at intake, with a further 14% scoring near ceiling (18 or 19). Therefore, the median change score is 0 in both groups. 35% of the outreach group showed improvement from intake to follow-up as compared to 20% of the information group. Mann-Whitney U test (including all scores) = 831)mean ranks: information = 41.6 & outreach = 53.2), $p < 0.05$.

FIM + FAM: The personal care, mobility, and communication subscales showed pronounced ceiling effects: 79%, 69%, and 54% of participants, respectively, scoring 6 and [AU: Should this be “6 or 7”?] 7 (maximum). 13% and 27% of participants scored at ceiling for psychological adjustment and cognitive functions, respectively. There was modest and similar improvement in both groups (mean ranks: outreach = 46.5, information = 47.4, U = 1058.5, NS). The maximum gain score was significantly greater in the outreach group than the information group (mean ranks: outreach = 53.2, information = 40.4, U = 782, $p < 0.025$).

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 present data present the strongest confirmation to date that structured multidisciplinary rehabilitation delivered in community settings can improve social functioning after severe brain injury. Within this randomized controlled trial, significantly greater gains were made by outreach treated participants than by those given only written information about alternative resources” (p. 199).

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 “However, the outreach group did not make substantive gains in terms of returning to paid employment, school and/or childcare nor in terms of improving non-family social contact, two key indicators of successful community integration” (Dawson, 2002, p. 84).

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 exact role of occupational therapy and the occupational intervention used in this study were not described. However, we can assume that the occupational therapists used functionally based interventions. “Functionally based rehabilitation shows promise for improving day to day life for people with severe TBI even many years after injury” (Dawson, 2002, p. 84).

Reference

Dawson, D. R. (2002). Commentary: A multidisciplinary community based rehabilitation programme improved social functioning in severe traumatic brain injury. *Evidence Based Mental Health, 5*, 84.

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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