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ORIGINAL RESEARCH

Replication of a Prospective Randomized Controlled Trial of Resource Facilitation to Improve Return to Work and School After Brain Injury

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Abstract

Objective: To determine the extent to which previous findings on the effectiveness of resource facilitation to impact return to work and school could be replicated.

Design: Randomized controlled trial.

Setting: Outpatient rehabilitation clinic.

Participants: Outpatients with acquired brain injury (N=44).

Intervention: Fifteen months of resource facilitation services.

Main Outcome Measures: A revised version of the Vocational Independence Scale and the Mayo-Portland Adaptability Inventory-4 Participation Index.

Results: Participants randomized to the resource facilitation group demonstrated a significant advantage in terms of rate and timing of return to productive community-based work relative to control participants. When examining only return to competitive work (and not return to school), 69% of the resource facilitation group was able to return compared with 50% of the control participants. Analyses of measures of participation in household and community activities revealed that both groups improved significantly over the 15-month study period, but no significant advantage for either group was demonstrated.

Conclusions: This study replicates the positive impact of resource facilitation in improving productive community-based activity, including competitive employment and volunteering in the community.

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Studies have revealed significant variability in rates of return to work after brain injury, ranging from 10% to 70%, potentially because of methodologic differences in the sample characteristics (eg, severity, differences in measurement, classification of return to work) and differences in treatment received (eg, specialized vocational programs).[1] A relatively recent systematic review of research on return to work after both traumatic brain injury (TBI) and non-TBI demonstrated that at 2 years postinjury, 40.8% of the participants with TBI were able to return to work and 39.3% of the participants with non-TBI were able to return to work.[2]

A number of factors that contribute to employment outcome after brain injury have been identified previously in the literature. These include initial injury severity, preinjury employment, and education and other cognitive, emotional, and behavioral outcomes that probably interact with employment. The complexity of these relations is best captured in the recent structural equation model from Schonberger et al.[3] To some degree, many of these factors are represented by a postacute measure of disability. To that point, a prior study of resource facilitation found that a global disability assessment with the Mayo-Portland Adaptability Inventory predicted employment outcome and superseded other variables, including injury severity and preinjury employment in a regression analysis.[4] For this reason, we characterized the current sample using a global measure of disability.

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Resource facilitation broadly refers to promoting access to services and coordinating care specific to the needs of a person with brain injury that proactively bridge medical and community-based services. The first study of resource facilitation was conducted by Malec et al.[4] This study demonstrated that 80% of patients with acquired brain injuries were employed in the community after receiving vocational case coordination. These investigators replicated their findings and reported that at the time of admission, 84% were unemployed, whereas at follow-up after treatment, 80% of the participants had obtained community-based employment.[5]

An initial randomized controlled trial with 22 participants with acquired brain injury who received 6 months of resource facilitation[6] demonstrated a significant statistical difference in return to work, with 64% of the resource facilitation participants competitively employed at follow-up compared with 36% of the control group. This study also showed significantly more improvement on a measure of community participation for the resource facilitation group relative to controls. The present study was conducted however because the sample size in this initial study was quite small, and consequently, the extent to which these findings would be generalizable to the population of people with acquired brain injury was questionable. Further, in our previous study, the intervention time was limited to 6 months based on available funding, and in the present study we were able to provide 15 months of resource facilitation services, which was thought to more accurately reflect clinical need. It was hypothesized that the treatment group would show better vocational independence than the control group at the end of the study; the treatment group would show increased productivity compared with the control group when split by goal (return to work vs return to school); the treatment group would demonstrate less psychological distress at the end of treatment relative to the control group; and the treatment group would show greater home and community participation measured by the Mayo-Portland Adaptability Inventory-4 Participation Index (M2PI).

Methods

Participants

Forty-four patients with acquired brain injury were recruited while participating in inpatient or outpatient programs. Inclusion criteria for the study were as follows: TBI or diffuse encephalopathy, including metabolic, infectious, or toxic (but not because of alcohol abuse) encephalopathy, or intracranial hemorrhage; between 18 and 60 years old; English as a native language or nonnative speaker with the assistance of a relative who is an English speaker or a translator; the individual with a brain injury has been employed and/or has attended school for 2 years prior to the injury; the individual has a return-to-work or return-to-school goal; and the participant or legal proxy consents to study participation. Exclusion criteria included the following: presence of acute psychosis or the emergence of psychosis during the course of the study and history of treatment received for substance abuse within the preceding 2 years.

List of abbreviations:

BSI-18	**Brief Symptom Inventory-18**
GSI	**Global Severity Index**
M2PI	**Mayo-Portland Adaptability Inventory-4 Participation Index**
TBI	**traumatic brain injury**
VIQ	**Verbal Intelligence Quotient**

Measures

Vocational and academic outcome

The primary dependent measures were a revision of the Vocational Independence Scale,[4] time to return to work (days from enrollment to starting community-based employment as classified by the Vocational Independence Scale), and the M2PI.[7] The Vocational Independence Scale was revised for purposes of this study to include levels of academic reentry (table 1).

Home and community participation

The Mayo-Portland Adaptability Inventory-4 was designed specifically for measurement of cognitive and physical abilities, psychosocial adjustment, and participation in activities at home and in the community.[8] Ratings from the participant were obtained for the M2PI, which includes items concerning social contact, self-care, recreational activities, management of finances, and transportation and types of productive activity, including work, homemaking, student activities, and volunteering.

Secondary measures

The Global Severity Index (GSI) of the Brief Symptom Inventory-18 (BSI-18)[9] was used to obtain data on the participant's psychological adjustment. The Orientation Log[10] and Cognitive Log[11] were used to obtain a rudimentary measure of the level of cognitive functioning. Data to further compare severity of injury and disability were retrospectively culled for available discharge scores on the FIM.[12] Additionally, when available, outpatient neuropsychological test results were retrieved from the medical records. Data from neuropsychological testing were available for measures of overall intellectual functioning, memory, problem-solving, speed of eye-hand coordination, and cognitive flexibility (table 2). Most subjects had outpatient neuropsychological testing within 2 months of being recruited for this study. Finally, type of work was categorized using the occupational classification scheme used by the Traumatic Brain Injury Model Systems[19] that was based on the 2009 Standard Occupational Classification, Bureau of Labor Statistics, U.S. Department of Labor.

Primary and secondary measures have demonstrated acceptable psychometric properties as described in greater detail in the references cited.[4,7-12]

Procedures

The study was approved by the Indiana University Institutional Review Board.

Consent/assent

Measures of cognitive functioning (Orientation Log and Cognitive Log; see Measures section) were obtained to provide objective measures for determining ability to consent to participate in the study. Potential participants who scored $\geq$25 on the Orientation Log and $\geq$15 on the Cognitive Log were considered able to consent to participate in the study. For those patients who did not meet these criteria, a legally authorized representative was given the option to consent for the person with brain injury.