

ORIGINAL RESEARCH

Moderators, Mediators, and Nonspecific Predictors of Treatment Outcome in an Intervention for Everyday Task Improvement in Persons With Executive Deficits After Brain Injury



Dirk Bertens, MSc,^a Luciano Fasotti, PhD,^{a,b} Danielle H. Boelen, PhD,^{b,c}
Roy P. Kessels, PhD^{a,c,d}

From the ^aDonders Institute for Brain, Cognition and Behaviour, Radboud University, Nijmegen; ^bRehabilitation Medical Centre Groot Klimmendaal, Arnhem; ^cDepartment of Medical Psychology, Radboud University Medical Center, Nijmegen; and ^dVincent van Gogh Institute for Psychiatry, Venray, The Netherlands.

Abstract

Objective: To identify moderators, mediators, and predictors of everyday task performance after an experimental combination of errorless learning and goal management training.

Design: Predictor analysis of a randomized controlled intervention trial.

Setting: Outpatient rehabilitation centers.

Participants: Patients (N=60) with acquired brain injury of nonprogressive nature with a minimal postonset time of 3 months.

Interventions: Participants were randomly allocated to 8 sessions of errorless or conventional goal management training.

Main Outcome Measure: Everyday task performance, assessed at baseline and after treatment by evaluating correct, ineffective, and missing task steps.

Results: Demographic variables, neuropsychological test performance, subjective cognitive function, and quality of life were selected as candidate predictors. The results showed that age ($P=.03$) and estimated intelligence quotient (IQ) ($P=.02$) emerged as moderators. Higher age was associated with better everyday task performance after conventional goal management training, whereas higher IQ was associated with better performance after errorless goal management training. Higher executive function scores after training predicted improved everyday task performance across the 2 treatment conditions ($P=.04$).

Conclusions: The identified predictors may contribute to a more tailored cognitive rehabilitation approach in which treatments and patients are better matched when clinicians decide to train everyday tasks.

Archives of Physical Medicine and Rehabilitation 2016;97:97-103

© 2016 by the American Congress of Rehabilitation Medicine

Many individuals with acquired brain injury experience difficulties when performing daily life activities because of problems with formulating goals and planning and initiating behavior.¹⁻³ These executive deficits are commonly observed in persons with brain injury referred for outpatient rehabilitation.⁴ Because even

subtle executive impairments may have an impact on everyday functioning,⁵ investigated interventions aimed at overcoming these problems have been developed.⁶ A well-studied intervention is goal management training (GMT),^{7,8} in which a cognitive strategy is practiced to keep a goal (ie, a complex daily task) and its corresponding subgoals and task steps actively in working memory.⁹ Patients are taught to monitor their own performance by using an algorithm in which not only the task steps are carried out, but also checking moments after each task step are trained to increase cognitive control.⁹ The application of GMT in individuals

Supported by the National Initiative Brain and Cognition (grant no. 056-11-011).
This project is embedded in the pillar The Healthy Brain, Program Cognitive Rehabilitation.
The Netherlands Clinical Trials Registration No.: NTR3567.
Disclosures: none.

with brain injury has been evaluated in several studies. In general, positive effects have been reported on self-report questionnaires, standardized cognitive tests,¹⁰⁻¹² and real-life activities (eg, financial management,¹³ meal preparation⁹). Recent evidence suggests that combining GMT with other training methods may increase its effectiveness.⁷

Recently, we performed a randomized controlled trial (RCT) to investigate the efficacy of GMT and errorless learning on everyday task performance in individuals with brain injury. This combined approach was compared with conventional GMT.¹⁴ Errorless learning refers to the prevention of errors that occurs during task acquisition in contrast with traditional trial-and-error learning in which errors occur naturally.¹⁵ The main aim was to train 2 individually selected everyday tasks (eg, meal preparation, online banking, cleaning a room). Thirty participants received the experimental combination of GMT and errorless learning, whereas 30 participants received conventional GMT. Those who were administered the experimental errorless GMT improved to a larger extent on everyday task performance than the participants who only received conventional GMT, in the absence of any baseline differences between the 2 groups.

Although the evaluation of the efficacy of treatments is important, it is also (clinically) relevant to investigate for whom or under what conditions a treatment works (ie, moderators of treatment outcome¹⁶) and through which possible mechanisms beneficial effects are achieved (ie, mediators of treatment outcome¹⁷). Knowledge concerning patient characteristics that predict or moderate improvement in everyday life activities could contribute to a more tailored approach and therefore to more effective and efficient rehabilitation treatments. Although the efficacy of GMT interventions or errorless learning has been studied previously, predictors for treatment success have not been reported.

The main aim of this study is to identify mediators and moderators of treatment outcome (ie, everyday task performance) in the aforementioned RCT. For the present analyses, we followed the guidelines of Kraemer et al¹⁷ for analyzing mediators and moderators in RCTs. Because studies investigating predictors in GMT and errorless learning are lacking altogether, we adopted a hypothesis-generating approach with an exploratory analysis. We selected several variables as possible predictors that could generate specific hypotheses for predicting treatment success.

Methods

Procedure

The protocol and rationale of the RCT were described in detail,¹⁸ and the effects on primary and secondary outcome measures were published elsewhere.¹⁴ Four outpatient rehabilitation centers participated in the study (Rehabilitation Medical Centre Groot Klimmendaal, Arnhem, The Netherlands; Sint Maartenskliniek, Nijmegen, The Netherlands; Don Calabria, Verona, Italy; Dacapo, Padua, Italy). All participants were aged between 18 and 70

years, lived independently at home, and had executive impairments caused by acquired brain injury (≥ 3 mo postinjury). The study is registered at the Dutch Trial Register (NTR3567) and approved by the Medical Review Ethics Committee region Arnhem-Nijmegen (NL38019.091.11). Participants gave written informed consent before engaging in the study, and data were obtained in compliance with the Helsinki Declaration. Executive impairments were assessed using an extensive neuropsychological test battery, including 7 executive function tests. Specifically, patients were included when they either performed >1.5 SD below the normative mean on at least 2 of the 7 executive tests or between 1 and 1.5 SD below the normative mean on at least 4 of those 7 tests. Moreover, memory and attention were assessed. Exclusion criteria were neurodegenerative disorders, substance abuse, severe premorbid psychiatric problems, or severe cognitive comorbidity. Participants were randomly assigned to 1 of the 2 treatment conditions (conventional GMT or the experimental combination of GMT with errorless learning) using a computerized block randomization procedure with a block size of 4. Sixty participants completed the study. The first 2 training sessions were identical for both treatment arms. During the second session 2 individually chosen treatment goals (ie, everyday tasks, such as cleaning a room, preparing a meal, and conducting an online transaction; for an overview see Bertens et al¹⁴) were selected by each participant. The remaining 6 sessions were dedicated to the training of these tasks. Execution of each task was filmed and assessed at baseline (after the second session) and after training. Neuropsychological assessment, consisting of parallel forms of the same tests when applicable, was administered after treatment as well. Moreover, participants and their proxies completed several questionnaires at baseline (before the videotaping of each task) and after treatment.

Treatments

The aim of both treatments was the training of 2 individually selected treatment goals, namely the successful completion of everyday tasks (eg, cleaning a room, preparing a meal, conducting an online banking transaction). Both interventions consisted of a form of GMT, including the use of information texts and (exercise) schemes, developed by the researchers and based on its original clinical manual.⁸ Both treatment arms consisted of eight 1-hour individual sessions given twice a week by trainers (trained occupational therapists or psychologists). The first 4 sessions took place in the participating centers, whereas the remaining 4 sessions were carried out at the participants' homes. The 2 treatments are described in detail elsewhere.¹⁸ Briefly, in conventional GMT, patients were taught a strategy to keep the selected everyday goal and the corresponding task steps active in working memory. Patients were trained to monitor their performance during the execution of the task steps and to check if they were still aware of all further steps that led to the goal.⁹ GMT was combined with errorless learning in the experimental condition. Here, acquisition and execution of task steps were trained using errorless learning techniques, such as the use of visual and verbal (feed-forward) instructions and cue cards.¹⁹

Moderators, mediators, and nonspecific predictors

In our exploratory analysis, demographic characteristics, baseline neuropsychological test performance, baseline subjective cognitive complaints, and baseline quality of life were selected as

List of abbreviations:

GMT goal management training
IQ intelligence quotient
RCT randomized controlled trial

Download English Version:

<https://daneshyari.com/en/article/3448022>

Download Persian Version:

<https://daneshyari.com/article/3448022>

[Daneshyari.com](https://daneshyari.com)