Evidence-based rehabilitation after Acquired Brain Injury: a clinical trial on a Holistic Neuropsychological Rehabilitation Program

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Introduction

Comprehensive-holistic neuropsychological programs have been recommended as a practice standard during post-acute rehabilitation in order to reduce cognitive and functional disability after moderate or severe brain injury. One major challenge of clinical research is to provide systematic data for the development of evidence-based neuropsychological rehabilitation. Rehabilitation after brain injury is concerned with reducing levels of disability, either through restoration, or the use of adaptive and compensatory strategies. The goal of rehabilitation is not only the remediation of cognitive impairment, but mainly the establishment of a meaningfully and satisfactory life in face of persisting limitations. Outcomes may be assessed at the level of impairment, activity or participation. This study aims to evaluate the efficacy of the Holistic Neuropsychological Rehabilitation Program (HNRP), held in Centro de Reabilitação Professional de Gaia in cognitive performance, emotional stability, functional ability and quality of life.

Methods

Twenty-six patients with Acquired Brain Injury (ABI) were selected for a prospective cohort study assigned in two groups: a treatment group (n = 15 ABI participants) received HNRP, a control group (n = 11 ABI participants) without rehabilitation. Both groups were statistically matched for demographic and clinical factors.

Table 1. Sample description

	N	Age (years) *M/SD*	Gender M/F	Education (Years) *M/SD*	TAI (Months) *M/SD*	Etiology TBI/Stroke	Severity severe/ *moder-ate*
Treatment group	15	29.1/7.5	11/4	9.4/3.4	31.7/20.0	10/5	13/3
Control group	11	35.45*/8.3	8/3	9.8/4.4	41.2/36.9	8/3	8/3

TAI = time after injury; Injury severity: 1=severe 2=moderate

Data was collected in two moments: before and after the program, with a time course of 18 weeks for both groups. Cognitive performance was assessed through neuropsychological standardised tests: *WMS III* for working memory, D2 for sustained attention, and *BADS* for executive functions. Emotional stability was measured by *HADS*. *GOSE* was used to assess functional ability and *Quality of Life* was measured by *QOLIBRI* – a specific scale to assess quality of life after brain injury. *Group*, *Time of Evaluation* and interaction effects were analysed via two-way repeated measures ANOVA.

Results

Concerning attention, a main effect was found for *Time*, with both groups showing better performance in the post-test in concentration [F (1,23)=10.37, *p*=.004). Despite the fact that there was no treatment effect on working memory as a whole, a marginal interaction effect *Group* X *Time* was found for the *Letter-Number Sequencing* subtest [F (1,24)=3.12, *p*=.09], with the Treatment Group reporting a higher score after the program. Regarding executive functions a marginal main effect was found for *Group* X *Time* for the *Rule Shift Cards* subtest with the Treatment Group reporting a higher score after the program [F (1,24)=3.74, *p*=.065]. Concerning emotional stability, an interaction effect *Group* X *Time* was found for depression [F (1,24)=6.11, *p*=.021], with the Treatment Group reporting a lower depression index after the program. As to functional ability and Quality of Life an interaction effect *Group* X *Time* was found, with the Treatment Group reporting an increased Quality of Life [F (1,24)=6.92, *p*=.015] as well as improved functionality after the program [F (1,24)=5.17, *p*=.032].

Conclusions

The results provide clinical evidence that comprehensive holistic neuropsychological rehabilitation improves emotional stability, functionality and quality of life after brain injury. The weak effect on cognitive functioning is probably related with the fact that standardized tests appear not to be the best option when evaluation improvement in daily function. Other cognitive measures of outcome should be considered to assess intervention, such as goal attainment.