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Neuropsychological rehabilitation and quality of life: A meta-analysis

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Abstract The purpose of this study was to conduct a meta-analysis on the effects of neuropsychological rehabilitation procedures on the quality of life in non-Spanish-speaking individuals with some cognitive deficit. Sixteen studies published during the 2001-2012 period which yielded relevant information regarding the sample sizes used, the types of statistical contrasts, the evaluation instruments or pathologies among others, were analyzed. We carried out study following the usual estimation procedures, based on the definition of the effect size and the scrutiny of their relationship with relevant variables (e.g., sample sizes, type of population), or methodological variables (e.g., type of research or sampling design). The data analysis shows a statistically significant effect ($r_+ = .38$; $p < .001$) in all the variables associated with the characteristics of the intervention (duration, type of intervention, gender, year of publication and, more importantly, quality of life and neuropsychological outcomes). As a general conclusion, we were able to determine that Quality of Life (QoL) can improve, under certain conditions, through neuropsychological rehabilitation, but this change is not permanent.

PALABRAS CLAVE
Rehabilitación neuropsicológica;
Calidad de vida;
Déficits cognitivos;
Meta-análisis

Rehabilitación neuropsicológica y calidad de vida: una aproximación meta-analítica

Resumen El propósito de este estudio fue generar un meta-análisis sobre los efectos de la rehabilitación neuropsicológica en la dimensión Calidad de Vida en muestras de no hispano-hablantes, con algún déficit cognitivo. Se analizaron dieciséis estudios publicados durante el período 2001-2012, que mostraron información relevante con respecto a los tamaños de muestra utilizados, los tipos de contrastes estadísticos, los instrumentos de evaluación o diagnóstico, entre otros. Se realizó el estudio siguiendo los procedimientos de estimación habituales, sobre

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la base de la definición del tamaño del efecto y el análisis de su relación con las variables relevantes (tamaños de muestra, tipo de población, etc.), o variables metodológicas (tipo de investigación o diseño de la muestra, etc.) El análisis de los datos muestra un efecto estadísticamente significativo ($r_+ = .38$, $p < .001$) en todas las variables asociadas a las características de la intervención (duración, tipo de intervención, género, año de publicación y, más importante, la calidad de vida y los resultados neuropsicológicos). Como conclusión general, la dimensión calidad de vida (QoL) puede mejorar, bajo ciertas condiciones, a través de la rehabilitación neuropsicológica, pero este cambio no es permanente.

Introduction

Health-Related Quality of Life (HRQoL) is a wide concept, but there exists consensus on it being a subjective measure of physical, emotional, and psychological conditions (Londos et al., 2008). Some studies define HRQoL as an assessment of how a disease and its treatment affect a person's capability to develop everyday activities and play valuable roles in their own life (Brissart, Leroy, & Debouverie, 2010; Fergusson et al., 2012). Neuropsychological diseases, like any other diseases, affect the quality of life (QoL) of those who suffer from it (Murell, 1999). In spite of that, the HRQoL of the persons suffering from neuropsychological alterations has not been widely studied, and it is often claimed that rehabilitating treatments in neuropsychological diseases improve the patients' quality of life without actually measuring HRQoL (Londos et al., 2008). Other works (Cicerone, 2005; Wilde et al., 2010) have recommended using HRQoL measures as outcome measures in order to grade the efficacy of neuropsychological rehabilitation in traumatic brain injury (TBI). Few works have studied the possible impact of neuropsychological interventions on the QoL of patients with cognitive alterations. There exist works on patients with epilepsy, TBI, multiple sclerosis, cardiovascular events, mild cognitive impairment, Alzheimer's disease, and persons on chemotherapy. The methodology used in those works includes pre- and post-treatment observational studies (Cohen, Ylvisaker, Hamilton, Kemp, & Claiman, 2010; Londos et al., 2008; Rasquin et al., 2010), case and control studies (Svendsen & Teasdale, 2006), and several clinical trials (Brenk, Laun, & Haase, 2008; Clare et al., 2010; Davis, Massman, & Doody, 2001; Engelberts et al., 2002; Gehring et al., 2009; Hildebrand et al., 2007; Lincoln et al., 2002; Solari, Pucci, Forni, Mancardi, & Pozzilli, 2004; Voght et al., 2009). Those studies present controversial results: whereas some find a positive effect of neuropsychological rehabilitation on QoL (Brenk et al., 2008; Clare et al., 2010; Cohen et al., 2010; Engelberts et al., 2002; Glanz et al., 2010; Melchers, Maluck, Suhr, Scholten, & Lehmkuhl, 1999; Svendsen & Teasdale, 2006), others do not (Davis et al., 2001). This positive effect on the patients' quality of life is observable immediately after rehabilitation but is not persistent in follow-up evaluations (Solari et al., 2004). Other works find a positive effect of cognitive rehabilitation on some, but not all, QoL measures (Seniow, Polanowska, Mandat, & Laudanski, 2003; Sitzer, Twamley, & Jeste, 2006). These are understandable controversies given that most works use small samples of patients with different diseases, have different designs, apply neuropsychological interventions of a different nature, duration, intensity, and use diverse instruments to measure HRQoL.

A previous work (Guàrdia, Jarne, Urzúa, & Gudayol, 2012) dealing with the impact of neuropsychological rehabilitation on QoL intended to approach this phenomenon by using meta-analysis techniques while bearing in mind their possible mediating effects in the analysis, as well as other substantive, methodological, and socio-demographic variables which may be affecting the results of the aforementioned works. That study yielded the following conclusions: the positive effect of the rehabilitating intervention is generally linked to an improvement in the patients' quality of life. Likewise the use of retraining techniques (techniques intended to restore the lost cognitive function) seems to have a positive effect on HRQoL that is more intense than the effect of compensatory techniques (techniques designed to improve specific aspects of everyday life despite the specific cognitive loss experienced by the patient). That positive effect of cognitive rehabilitation on HRQoL tends to decrease as time goes by between the clinical intervention and the follow-up; and when analyzing the data as a whole, each study's sample size and design have a direct influence on the effect size of the QoL improvement. In fact, the above-mentioned work re-analyzes data from Spanish-speaking samples, and as the authors admit, most of the studies included in their study have a pre- post- simple design where the variable control mechanisms are minimal, and they tend to magnify the effect sizes of the phenomenon under study (Ahn, Myers, & Jin, 2012). Moreover the study purposefully excluded the works conducted with non-Spanish-speaking samples, and consequently, it involved relatively few works. On the date of its publication, there existed no other meta-analyses on the subject that allowed the authors to contrast their findings. Therefore their conclusions must be considered preliminary and they should be contrasted with results from non-Spanish-speaking samples, much more common in scientific literature.

Thus, the goal of the present study is to conduct a meta-analysis of the effects of neuropsychological rehabilitation on the QoL of patients with neuropsychological alterations by using non-Spanish-speaking samples, according to the