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Computer program in the treatment for major depression and cognitive impairment in university students

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Abstract

Introduction: A depressed patient presents cognitive impairment that remains in spite of depression's remission. This study intends to evaluate the impact of cognitive training in the treatment of depression, and also of the impairment that depression causes.

Method: A program for cognitive training (Alcor) was designed for and applied to a group of patients ($n = 10$) with non-medicated MDD; a group ($N = 10$) with MDD that was treated with the program and with anti-depressants, and to another group ($n = 11$) that was given anti-depressors only. The impact of this intervention was assessed by applying the following instruments: Beck Depression Inventory, WAIS, Spielberger State-Trait Anxiety Inventory, Externalized Problems Assessment Scale for Adolescents and Young Adults, and Attention Problems Assessment Scale. The program was applied to University students with MDD twice a week, until they had reached adequate levels of execution.

Results: The patients of all three groups showed MDD event remission. Those who received cognitive training showed a substantial increase of intellectual performance. The cognitive treatment group increased IQ in 12.9 units and the combined group increase in 13.3 units. There was a slight decrease of 1.9 units within the anti-depressant treatment group. The changes in attention and in externalized problems showed the same trends.
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1. Introduction

This study makes a proposal to improve cognitive functioning in subjects with Major Depression Disorder (MDD), through a cognitive treatment assisted by a software designed and developed for this purpose.

In Mexico, depression has a prevalence of 7.9% in general population (Secretaría de Salud, 2003), and in university students it increases up to 11.8% (Manelic & Ortega-Soto, 1995).

Patients with major depression disorder (MDD) show cognitive deficits (Austin, Mitchell, & Goodwin, 2001; Austin et al., 1992), for instance, failures in executive functions such as cognitive flexibility, problem solving (Merriam, Thase, Haas, Keshavan, & Sweeney, 1999; Paelecke-Habermann, Pohl, & Leplow, 2005), psychomotor speed (Sobin & Sackeim, 1997), deficits in domains in memory (Marcos, Salamero, Gutiérrez, Catalán, & Lázaro, 1994; Weiland-Fiedler et al., 2004), and deficits in domain of attention (Marcos et al., 1994; Weiland-Fiedler et al., 2004). As a consequence of these failures, depression also causes disabilities in cognitive functioning which will then lead patients to show social, working performance, academic and intellectual impairment. Massel et al. (1990) evaluated work efficiency in 600 subjects with mental disorders and found that there was a significant relationship between the severity of psychiatric symptoms and productivity. Among depressed patients, psychomotor retardation was the most important factor in work reduction. Mintz, Mintz, Arruda, and Hwang (1992) evaluated the effects of anti-depressants and psychotherapy on work impairment in depressed patients. Original databases from 10 published treatment studies were compiled and analyzed ($N = 827$). Functional work impairment was common at baseline, manifested by unemployment (11%) or on-the-job performance problems (absenteeism, decreased productivity, interpersonal problems, 44%), only 55% fulfilled the criteria required to go back to work after treatment. According to the Global Burden Disease Study (GBD), MDD ranks fourth as a cause for loss of years due to work disability; in the projection towards 2020 it is considered as the second cause (Murray & Lopez, 1996; Murray & López, 1997a, 1997b).

Academic deterioration is evidenced mainly in absenteeism, low academic performance, bad interpersonal relationships and wrong perception of academic competence. Rapport, Denney, Chung, and Hustace (2001) presented a lineal structural model which co-relates children's school performance with anxiety and depression. They used intellectual quotient as the control variable of the model and conjectured that academic performance is related to the severity of depression and to the child's isolation due to his/her classroom execution and cognitive functioning. Children who were most depressed presented deficiencies in cognitive functioning and those more introverted had the worst performance in the classroom. On the other hand, depression in university students affects academic performance, satisfaction with studies and social relationships which, in turn, generate stress and thus reinforce the depressive state (De la Peña, Estrada, Almeida, & Paez, 1999); Heiligenstein, Guenther, Hsu, and Herman (1996) found out that 92% of the students diagnosed with depression presented academic impairment. Cognitive damage persists in spite of the