

Exercise is Medicine: Is there a Dose-response for Major Depression?

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Editorial

Major Depression (MD) is a common and disabling disease, affecting more than 100 million people worldwide [1], associated with impairments in patients' cognitive abilities, and reduced health and quality of life (QoL) [2]. The prevalence of depression is around 15% to 20%, with females experiencing rates that are 1.5 to 3 times higher than those of males, with predominance on adolescence [3].

MD is usually treated with antidepressant medications and psychotherapy, but only 25% of the population has access to these types of intervention [4]. However, the rate of remission of patients undergoing antidepressant treatment is approximately 50%, which encourages investment in alternative therapies [5,6], such as aerobic exercise (AE).

AE is considered a relevant therapeutic option, available as a form of effective treatment in mild to moderate depression [7,8], and its regular practice can bring physiological, psychological and social benefits to practitioners [9,10]. Studies show that AE is an important factor in the treatment of depression [11], providing positive physiological and psychological changes involved in mood enhancement.

AE contributes to autonomic balance and its effects can extend to improve mental health with reduction of symptoms [8,12], of weight gain induced by antipsychotics [13], and of cardiovascular risk [14], and increase in cardiorespiratory fitness (APCR) [15]. However different methods and intensities may provide different psychological responses to exercise, interfering with adherence [16].

Regarding the AE methods, Ekkekakis [16] demonstrated that self-selected AE, i.e., when intensity is selected by the practitioner, can provide superior psychological responses compared to the imposed or prescribed exercise (i.e., externally defined intensity). Some authors have suggested that self-selected exercise is more effective in improving depressed mood and well-being when compared to exercise prescribed in a given intensity range [17,18]. Callaghan et al. [19] identified that 12 sessions of self-selected AE provided a superior effect in reducing depression compared to exercise at prescribed intensity. However, Knapen et al. [20] and Meyer et al. [21] have identified that self-selected AE does not generate superior effects in reducing depression. Nevertheless, Meyer et al. [21] demonstrated that self-selected AE, when compared to the prescribed exercise, provided a lower post-exercise BDNF (brain-derived neurotrophic factor) plasmatic response.

In addition, high-intensity exercise has been shown to be effective in clinical populations [22]. In this sense, Jung et al. [23] reported that individual sessions of high intensity interval exercise resulted in a more positive affective response than continuous exercise at moderate or vigorous intensity. Nelson and Morgan [24] and Meyer et al. [25] did not find differences between self-selected AE performed in mild, moderate and high intensity on mood, well-being and depression.

In another experiment, Meyer et al. [21] examined the relationship between changes in serum total BDNF and acute post-exercise mood in depressed women and identified that the exercise led to improvement in depression irrespective of intensity, providing significant acute

increases in BDNF serum levels, which were also not dependent on intensity. In addition, Bartholomew et al. [26] AE performed on treadmill with moderate intensity are sufficient to improve mood and well-being in depressed individuals. However, increased exercise intensity may lead to more vagal withdrawal, not being interesting in depressed patients with cardiovascular comorbidities. Therefore, findings seem to be inconsistent and do not allow establishing the appropriate dose-response. It is important to identify them so that professionals involved with the prescription can provide benefits with safety, aiming to increase the adherence of this population to regular physical exercises.

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