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Investigation of associations between recurrence of major depressive disorder and spinal posture alignment: A quantitative cross-sectional study

Janette Z. Canales[a,*], Juliana T. Fiquer[b], Rodolfo N. Campos[c],
Márcio Gerhardt Soeiro-de-Souza[a], Ricardo Alberto Moreno[a]

[a] Mood Disorders Unit (GRUDA), Department of Psychiatry, School of Medicine, University of São Paulo, R. Dr. Ovídio Pires de Campos 785, 05403-010 São Paulo, Brazil
[b] Laboratory of Medical Investigation (LIM 23), Department of Psychiatry, School of Medicine, University of São Paulo, R. Dr. Ovídio Pires de Campos 785, 05403-010 São Paulo, Brazil
[c] Department of Psychiatry, Federal University of Goiás, Primeira Avenida, Sem Número, Setor Universitário, 74000-000 Goiânia, Goiás, Brazil

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ABSTRACT

The aim of this study was to investigate associations between poor spinal posture and the recurrence of major depressive episodes and severity of symptoms in patients with major depressive disorder (MDD). This was a cross-sectional quantitative study of MDD patients. Outpatients were recruited from consecutive admissions at a mood disorders unit of a tertiary psychiatric hospital. Of 136 MDD patients, 72 (53 women, 19 men; mean age, 42.4 ± 9.1 years) met all the criteria and completed the study. Forty-one patients were classified with a recurrent episode (RE) of MDD and 31 with a single episode (SE). Quantitative assessments of postural deviations were made using photogrammetry, including kyphosis, shoulder protraction, and head inclination. The severity of depressive episodes was assessed using the Hamilton Depression Rating Scale. The diagnosis and classification of patients were performed according to DSM-IV-TR and SCID criteria. Multivariate analysis of variance indicated that the RE group had greater anterior head inclination (35.39; SD: 1.57), greater scapular abduction (1.69; SD: 0.93), and worse thoracic kyphosis (139.38; SD: 1.19) than the SE group ($p < 0.001$ for all). Multivariate analysis of covariance showed an interaction between the severity of depressive symptoms and the degree of thoracic kyphosis ($p = 0.002$). Recurrence of depressive episodes is associated with measures of postural misalignment.

1. Introduction

Major depressive disorder (MDD) is a serious health problem and will be the second leading worldwide disease burden by 2030 [1]. According to the Diagnostic and Statistical Manual of Mental Disorders Edition IV-Text Revised (DSM-IV-TR), MDD comprises diminished interest in all/most activities, depressed mood for most of the day, insomnia or sleeping too much, psychomotor retardation, loss of energy, diminished concentration ability, and recurrent thoughts of death [2]. MDD is more common in women than men and is highly recurrent [3].

Individuals who suffer from a first depressive episode have a 40%–60% chance of experiencing a subsequent episode. Individuals with two previous episodes have approximately a 60% chance of a further episode, and for individuals with three episodes the risk is as high as 90% [4–6].

The physical symptoms of depression include psychomotor delay, fatigue, diminished energy, and pain. Depressed patients demonstrate alterations in their motor and cognitive functioning, which can affect adaptation to variations in the everyday environment. Motor retardation is a prominent clinical feature of major depression [7], and depressed individuals tend to have slower gait, slumped posture, and less steadiness when walking than normal individuals [8,9].

Correct upright posture is an important health marker [10]; some deviations in body posture can be unsightly and can adversely affect muscular efficiency [11]. Posture may be defined as the composition of the positioning of all body segments at a given point in time [12]. Intrinsic and extrinsic factors that can

* Corresponding author.
  E-mail address: janettecanales@gmail.com (J.Z. Canales).

influence posture include heredity, socioeconomic level, and emotional factors [13]. Posture can reflect biomechanical aspects of the body such as misalignment, shortening, and pain, but also reflects emotional state through non-verbal communication [14,15]. When an individual cannot express their feelings using facial gestures, posture becomes an ideal vehicle for bodily expression. [16]. Postural assessment can be an important clinical diagnostic tool in therapeutic practice, useful for comparing and verifying the efficacy of interventions such as physical exercise [17]. Clinical use of postural assessment includes physiotherapeutic assessment of body posture and psychological and psychiatric assessment of body language. One study showed that reduced walking speed and slumped posture unambiguously characterized the gait patterns of sad and depressed individuals [9]. Static body posture is a reliable source of emotional information and can indicate how emotion is expressed through the body [16]. In addition to motor impairment and gait, poor posture is associated with MDD. Therefore, postural assessment is clinically relevant and may reflect both physical aspects and emotional expression [18].

One study of athletes and non-athletic male students found no relationship between depression and thoracic kyphosis [19]. In contrast, another study [20] reported a positive relationship between increased angle of curvature of kyphosis and depressive symptoms in students. A relationship between low self-esteem and elevated thoracic kyphosis has also been documented [21].

Rosário et al. [22] investigated the association between depression and body posture in 40 women, in the absence of neurological, psychiatric, or musculoskeletal disorders. Relationships were found between depression scores and the angle of Tales (a scoliosis marker); current depression and inclination of the head and shoulders; chronic depression and shoulder protraction. Evidence therefore suggests that depression and sadness may change posture.

Previous studies have suffered from methodological limitations, such as the use of non-clinical samples and symptom scales, instead of DSM-IV-TR criteria [19,20,22]. A previous quantitative study by our group over a 10-week period assessed body posture in 34 MDD patients and compared it with that of 37 healthy controls. Posture was assessed during a depressive episode using digital photographs of the subjects. Postural changes during depressive episodes included significant increases in anterior head flexion, increased thoracic kyphosis, a trend toward pelvic retroversion, and an increase in scapular distance. All these interfere with the proper functioning of skeletal muscles. During symptom remission, the posture of the patients with depression was similar to the control group. In addition to consequences such as pain, tension, and shortness of breath, such posture alterations are often
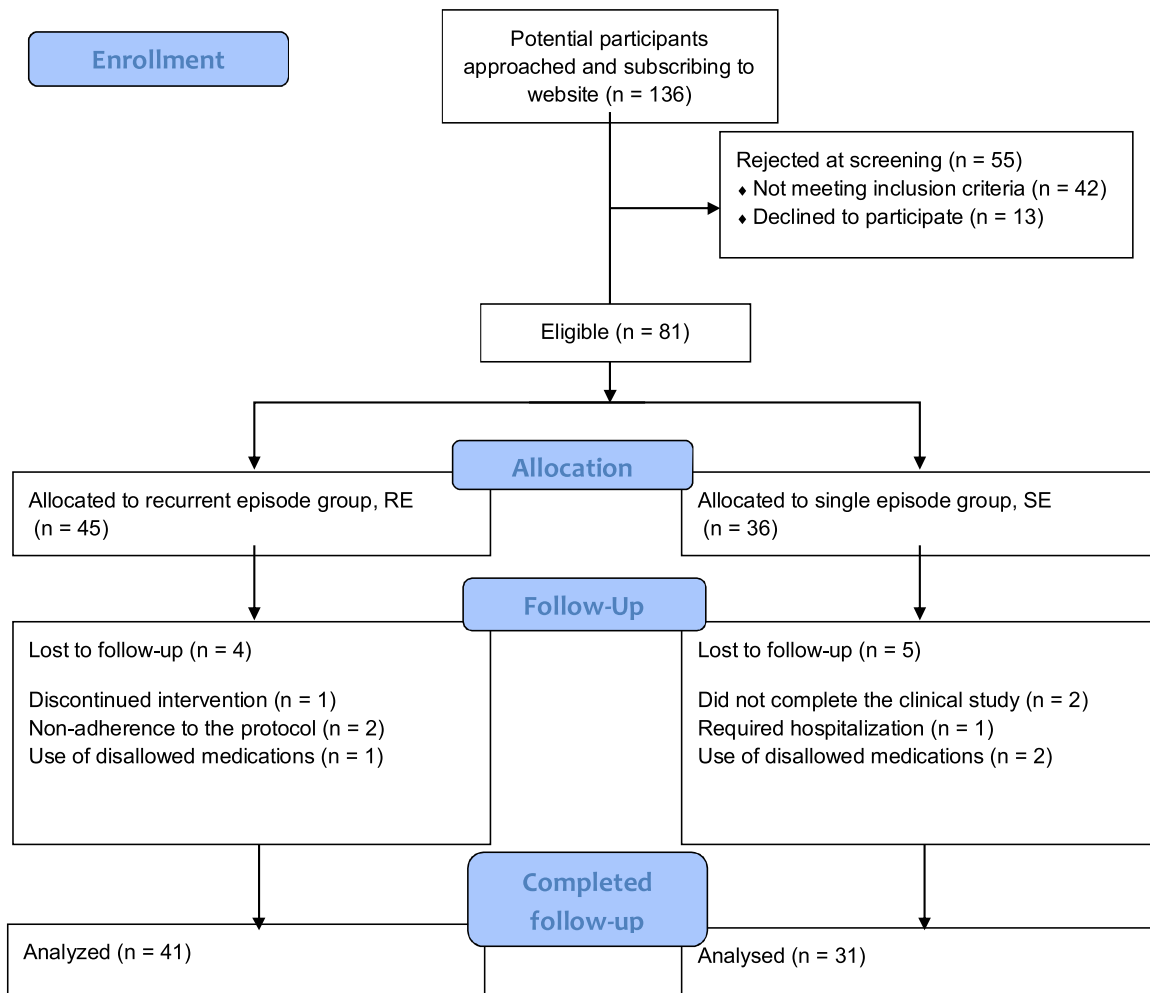

Fig. 1. Flow of participants through the trial.