Journal of Psychosomatic Research 75 (2013) 425–430

Contents lists available at ScienceDirect

Journal of Psychosomatic Research

Assessing depression in obese women: An examination of two commonly-used measures

Kristin L. Schneider [a,*], Andrew M. Busch [a,b,c], Matthew C. Whited [a,d], Bradley M. Appelhans [a,f], Molly E. Waring [a,e], Sherry L. Pagoto [a,g]

[a] University of Massachusetts Medical School, United States
[b] Alpert Medical School of Brown University, Department of Psychiatry and Human Behavior, Providence, Rhode Island, USA
[c] The Miriam Hospital, Centers for Behavioral and Preventive Medicine, Providence, Rhode Island, USA
[d] East Carolina University, Department of Psychology, Greenville North Carolina, USA
[e] University of Massachusetts Medical School, Department of Quantitative Health Sciences, Worcester, Massachusetts, USA
[f] Rush University Medical Center, Department of Preventive Medicine, Chicago, Illinois, USA
[g] University of Massachusetts Medical School, Department of Medicine, Worcester, Massachusetts, USA

ARTICLE INFO

Article history:
Received 8 March 2013
Received in revised form 22 August 2013
Accepted 23 August 2013

Keywords:
Beck Depression Inventory
Depression
Hamilton Depression Rating Scale
Measurement
Obesity

ABSTRACT

Objective: Obesity and depression are associated with somatic complaints that may complicate the measurement of depression in obese individuals. The Beck Depression Inventory-II (BDI-II) and the Hamilton Rating Scale for Depression (HRSD) are frequently used to measure depression severity. The BDI-II and HRSD's ability to measure depression severity may be compromised in those with obesity, to the extent that scores on their somatic items stem more from obesity than from depression. This study examined the: 1) internal consistency of the BDI-II and HRSD among obese women who varied in depressive symptomatology and 2) total and item-level change in the measures among participants who met the criteria for depression remission at 6-months.
Methods: Data were from a randomized controlled trial of obese women with depression who received either behavioral activation for depression followed by a lifestyle intervention or a lifestyle intervention with attention control.
Results: At screening ($n = 355$), internal consistency was strong for the BDI-II ($\alpha = 0.89$), but moderate for the HRSD ($\alpha = 0.67$). Among the participants who met the criteria for depression remission following treatment ($n = 115$), every BDI-II item showed significant change at 6-months. In contrast, three HRSD items did not significantly change: the anxiety—somatic ($p = 0.063$), somatic symptoms—gastrointestinal ($p = 1.000$) and loss of weight ($p = 0.319$) items.
Conclusion: The BDI-II may be more reliable and sensitive to change than the HRSD in obese women with comorbid depression. Intervention studies involving obese, depressed women should consider these findings in selecting depression outcome measures.

Introduction

Obesity and major depressive disorder (MDD) are highly comorbid in the population [1]. In nationally representative samples, prevalence estimates of MDD in obese samples range from 18.6 to 24.1% [2,3]. In weight loss treatment-seeking obese samples, prevalence of MDD is higher, with 19–50% reporting a lifetime history of MDD [4–6]. The comorbidity may be due, in part, to common symptoms. Adults with obesity report higher rates of sleep disturbance, weight gain, increased appetite, and fatigue, all of which are symptoms of MDD [7–10]. The overlap in symptoms of MDD and common physical complaints in obesity may complicate depression assessment in obese individuals, which has implications for treatment studies that address the comorbidity [11].

We conducted a randomized controlled trial that sought to facilitate weight loss in women with comorbid obesity and MDD [12]. The trial examined whether a lifestyle intervention that includes evidence-based depression treatment (BA) facilitated greater weight loss than a lifestyle intervention alone (LI). Though participants in both conditions lost weight, no differences in weight loss were observed between the two conditions at the 6-month assessment [12]. For depression, participants in the BA condition reported significantly greater reductions in Beck Depression Inventory-II (BDI-II) scores at 6-months compared to the LI condition. In contrast, scores on the Hamilton Depression Rating Scale (HRSD) at 6-months were not significantly different between conditions. A similar pattern emerged when BDI-II and HRSD response

* Corresponding author at: Rosalind Franklin University, Department of Psychology, 3333 Green Bay Road, North Chicago, IL 60064, United States. Tel.: +1 847 578 3311 (work); fax: +1 857 578 8765.
E-mail address: kristin.schneider@rosalindfranklin.edu (K.L. Schneider).

0022-3999/$ – see front matter © 2013 Elsevier Inc. All rights reserved.
http://dx.doi.org/10.1016/j.jpsychores.2013.08.015

cutoffs were used (i.e., at least a 50% reduction in scores), such that the BDI-II response rates were significantly different between conditions (66.4% of BA participants and 44.4% of LI participants were classified as responsive to treatment at 6 months), while the HRSD response rates were not (69.7% vs. 56.1%). However, when remission cutoffs were used (i.e., returning to the normal score range for each scale), differences by condition were significant at 6-months for the BDI-II and HRSD. To understand the discrepancy between BDI-II and HRSD in this sample, the purpose of the present study is to examine the reliability of these measures, as well as the sensitivity to change of the individual items and total score.

The HRSD and the BDI-II [13] are two of the most commonly used measures of depression severity and are frequently the primary and secondary outcome measures, respectively, used in depression treatment research (e.g., [14,15]). There are significant differences between the two scales, including unique strengths and weaknesses. The HRSD is a clinician-rated semi-structured interview, which enables the blinding of assessors to the participants' randomized condition in research. Despite this advantage, participant responses to the assessor's questions are not immune from response bias, unless patients are blinded to treatment as well. Substantial literature exists on the reliability and the validity of the HRSD to measure depression severity in depressed samples [16], though it has been criticized for not reflecting current DSM-IV diagnostic criteria for MDD [17]. The HRSD emphasizes somatic symptoms of depression (e.g., three items assess sleep disturbances) and ignores some atypical symptoms of depression (e.g., increased appetite, hypersomnia), and thus may not capture all subtypes of MDD. Unlike the HRSD, the BDI was revised in 1996 (BDI-II) to evaluate all of the MDD diagnostic criteria from the DSM-IV. The BDI-II has substantial support for its reliability and validity [16], but is a self-report measure that requires a fifth grade reading level, and may be vulnerable to response bias, especially when participants are not blinded to their treatment condition.

Using self-report depression measures, like the BDI, with obese samples has been questioned due to the inclusion of somatic items (e.g., tiredness, sleep disturbance) [18]. No research exists on the ability of the HRSD to assess depression among obese individuals. In a study of adults with multiple sclerosis and MDD, five HRSD items (i.e., somatic anxiety, psychomotor agitation, psychomotor retardation, late insomnia and insight) did not significantly change following successful depression treatment [19]. In contrast, all BDI items demonstrated significant change following treatment. Moran & Mohr [19] concluded that these five HRSD items may obscure the degree to which HRSD can detect change in depression in adults with multiple sclerosis. The same could be true for obese populations, but this has not been explored. Few trials have targeted comorbid obesity and MDD, thus we had a unique opportunity to address this question.

This study examines the ability of the BDI-II and the HRSD to assess depression symptomatology and treatment response in obese women with comorbid MDD using data collected from a randomized controlled weight loss trial. The first study aim was to assess the reliability of these measures by examining the internal consistency of the BDI-II and the HRSD among a sample of obese women who varied in depressive symptomatology at an initial screening visit. Second, the sensitivity to change of the BDI-II and HRSD items was examined by testing whether the individual items and the total scale score significantly decreased following treatment among all participants who no longer met the criteria for depression by the end of treatment. We hypothesized that the somatic symptom items of the BDI-II and the HRSD would not significantly change following depression treatment, while the cognitive and behavioral items would significantly improve following treatment. To examine the consistency of the sensitivity to change results among participants who received an evidence-based depression treatment, these analyses were repeated with the participants who received behavior therapy for depression and recovered from depression.

Methods

Data for this secondary data analysis were collected via a randomized controlled trial testing whether obese women with major depression lost more weight if they received behavioral activation for depression followed by a lifestyle intervention (BA) compared to a lifestyle intervention with health education attention control (LI). Complete study methodology is described elsewhere [20]. Specific methodology relevant to the current study is subsequently described. The Institutional Review Board of the University of Massachusetts Medical School approved this study.

Samples

Three different analytic samples were used for this study. The first analytic sample included all participants with complete screening data for the BDI-II and the HRSD, regardless of whether they met the eligibility criteria for the parent trial ($n = 355$), because this sample includes the widest range of depression scores to examine internal consistency. To maximize our sample size for the sensitivity to change analyses, the second analytic sample included all participants who recovered from depression at post-treatment according to the Structured Clinical Interview for DSM-IV-TR disorders (SCID; $n = 115$), since significant change in depression was observed in both conditions. The third analytic sample included a subset of participants who were randomized to behavior therapy for depression and recovered from depression at post-treatment according to the SCID ($n = 55$), which allowed us to examine the consistency of the sensitivity to change analyses among those who received evidence-based treatment for depression.

Procedures

Participants were recruited from community advertisements and flyers, and through referrals from primary care clinics for a weight loss study. Interested individuals called to learn about the study and complete a telephone screening to assess initial eligibility. The telephone screening included assessment of depression symptoms, weight, height, current and past physical and mental health conditions and medications. Potentially eligible participants then were scheduled for an in-person screening session. Participants were scheduled for an in-person screening if they endorsed 3 or more symptoms of depression and had a body mass index (BMI) between 29 and 41 kg/m^2 based on self-reported weight and height. This BMI range was wider than the study inclusion criteria range of 30–40 kg/m^2 to limit the exclusion of individuals who may have misreported their height and/or weight. Individuals were ineligible at the telephone screening if they endorsed an exclusionary medical or psychiatric condition (e.g., bipolar disorder, psychotic disorder, bulimia, post-traumatic stress disorder, or type 1 or 2 diabetes), reported use of medications that impact weight (e.g., corticosteroids, tricyclic antidepressants), were currently in psychotherapy, reported a psychiatric hospitalization in the past year, were pregnant or trying to become pregnant, reported smoking or were non-English speaking.

Participants who attended the in-person screening session were told that the study was testing two different approaches to weight loss in the context of depression and that they would be randomly assigned to one of the two approaches to help them lose weight and potentially improve their mood. Participants were informed that the BA condition would begin with behavior therapy, and at week 8, they would begin a lifestyle intervention, while the LI condition would begin with the lifestyle intervention and have health education visits interspersed. Participants provided written informed consent and completed the Structured Clinical Interview for DSM-IV-TR disorders (SCID) [21], the Beck Depression Inventory-II (BDI-II) [13] and the Hamilton Rating Scale for Depression (HRSD) [22]. Weight and height were measured to calculate BMI. Participants eligible for the trial met the criteria for MDD according to the SCID, did not endorse suicidal intent, had a measured BMI between 30 and 40 kg/m^2 and received physician approval to participate in the