VALUE IN HEALTH REGIONAL ISSUES 1 (2012) 235–243

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PATIENT–REPORTED OUTCOMES

# Prevalence, Awareness, Treatment, and Burden of Major Depressive Disorder: Estimates from the National Health and Wellness Survey in Brazil

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ABSTRACT

**Objective:** Major depressive disorder (MDD) is often underdiagnosed, undertreated, and associated with negative health outcomes. The current study examined the prevalence of MDD signs and symptoms in Brazil, including awareness, diagnosis, treatment, and the association of MDD with health outcomes. **Methods:** Data were collected from the 2011 National Health and Wellness Survey in Brazil (N = 12,000). Excluding those with bipolar disorder, respondents who met Patient Health Questionnaire-9 criteria for MDD (n = 1105) were compared with those not qualifying as having MDD or any depressive symptoms (n = 8684), analyzing separately those currently taking (n = 184) or not taking (n = 155) prescription medication for depression. Sociodemographics and health status, symptoms, experience of depression, diagnosis, MDD severity, pharmacotherapy, productivity impairment (Work Productivity and Activity Impairment questionnaire), health status (Short-Form 12, version 2), and health care resource use were measured. Results were weighted and projected to the Brazil adult population. Differences were measured with column proportion and mean tests for categorical and continuous outcomes, respectively. **Results:** MDD prevalence was 10.2%, with only 28.1% of the individuals with MDD diagnosed and 15.6% currently using prescription medication for depression. Males were especially likely to be unaware of MDD. Compared with non-MDD controls, patients with MDD (treated or untreated) reported significantly greater overall work impairment, worse mental and physical health status, and greater health care resource utilization (all $P < 0.05$). There was a trend for worsening health outcomes with increasing MDD severity. **Conclusions:** These findings suggest that Brazilians may be underdiagnosed and undertreated for MDD. Individuals with MDD reported substantially poorer health outcomes, suggesting the need to increase MDD awareness, especially among males, and provide better access to treatment.

***Keywords:*** Brazil, depression, health-related quality of life, major depressive disorder, prevalence, resource use, treatment, work productivity.



## Introduction

Major depressive disorder (MDD) is characterized essentially by "depressed mood" and "loss of interest or pleasure in nearly all activities" according to the *Diagnostic and Statistical Manual of Mental Disorders IV* [1]. MDD is a common mental condition associated with substantial morbidity and economic burden [2]. The World Health Organization ranks depression as the largest contributor to years lost to disability and the fourth largest contributor to disability-adjusted life-years [2]. Other signs and symptoms include feelings of guilt, anxiety, fatigue, sleep disturbance, and cognitive and sexual dysfunction [3].

MDD is common in Brazil, with recent estimates of 1-year prevalence ranging from 7.1% to 10.0% [4–6]. Yet, evidence suggests that Brazilians with MDD do not often seek mental health treatment and may incur substantial costs because of other forms of health care service utilization and work loss [4–6]. Andrade et al. found that 46.7% of São Paulo city residents with mood disorder reported utilizing general medical care in the past month and 23.2% utilized specialty medical care in the past month. In a later analysis, however, Andrade et al. found that only 7.7% of São Paulo residents with mental disorder sought health care treatment for their mental condition in the preceding year. In the United States, it is estimated that only 33.9% of the individuals with MDD are treated pharmaceutically [7]. It is unclear to what extent Brazilians are aware of the signs or symptoms consistent with MDD and to what extent they are diagnosed and treated.

MDD may also affect health-related quality of life (QOL). As Herrman et al. [8] found, Brazilian outpatients with high depression severity scores on the Center for Epidemiologic Studies Depression Scale were less likely to report good to excellent health, to be satisfied with their health, or to report good to very

Conflicts of interest: The authors have indicated that they have no conflicts of interest with regard to the content of this article.

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http://dx.doi.org/10.1016/j.vhri.2012.09.011

good global QOL compared with outpatients with lower scores. Moreover, Guajardo et al. [9] showed that outpatients with the core symptoms of MDD (loss of interest and depressed mood) exhibited significantly lower health-related QOL scores on all domains of the Short Form-36. Similar results were reported by Rocha and Fleck [10], administering the World Health Organization QOL-BREF instrument, among a sample of 119 community-dwelling adults and 122 tertiary hospital patients.

Brazil is a large nation, with diverse cultural and socioeconomic circumstances, limiting the generalizability of burden of illness studies employing outpatient samples (of which there are several examples) [8,9,11–14]. Other studies measured the effect of MDD in unique subpopulations, such as caretakers [15], health service workers [16,17], or the elderly [18–20]. Still other studies measured the effect of MDD in respondents with comorbidities known to occur with depressive symptoms [21–23].

The effect of MDD in particular subpopulations or among respondents with particular comorbidities cannot be assumed equivalent to its effect in the general population or among respondents without those comorbidities. Similarly, treatment rates of MDD in primary care–based settings may overestimate the true rates present in the general community, in which respondents may not readily seek health care services. Few, if any, studies have assessed the extent to which Brazilian residents are aware that they exhibit signs or symptoms consistent with MDD or how frequently MDD cases are diagnosed.

As such, population-based comparisons of respondents with and without MDD are needed to describe the burden of MDD in Brazil. Moreover, epidemiological data are needed to elucidate the extent to which Brazilian residents exhibit symptoms of MDD, are aware of symptoms and signs of MDD, and are diagnosed or treated for their condition.

The objective of the current study was to measure the prevalence of signs and symptoms consistent with MDD and to determine the extent to which respondents are aware of their condition and are diagnosed and treated for it, in a population-based sample in Brazil. Furthermore, the study sought to determine the association between MDD and health-related QOL, work productivity, and health care utilization by comparing respondents treated or untreated for MDD with those not experiencing any MDD symptoms, as well as examining MDD and outcomes at differing levels of severity.

## Methods

### Sample and Procedure

Data were collected from the 2011 National Health and Wellness Survey in Brazil, a cross-sectional survey of adults aged 18 years or older (Kantar Health, New York, NY) fielded initially in the United States in 1998 and now expanded to 10 countries. Initial translation of the English survey to Portuguese, excluding instruments listed below that were explicitly validated in Portuguese by the authors, was handled by Transperfect (http://www.transperfect.com), which is certified to ISO 9001:2008 and EN 15038:2006 standards. Review of the translation was then conducted by Absolute Translations (http://www.absolutetranslations.com), which is certified to ISO 9001 standards. Invitations to participate were sent to members of the Lightspeed Research Internet panel via e-mail, and the survey was administered online, with some respondents (especially those aged 65+ years) using computer-assisted Web interviews, in select facilities or participants' homes for those unable to travel. By using this approach, gender-matched interviewers were assigned to read and input the responses from these participants into the Internet-based survey. A stratified, random sampling procedure (for all participants) was implemented according to gender and age (based on the International Database of the U.S. Census [http://www.census.gov/population/international/data/idb/informationGateway.php]) for the final sample to be representative of the general Brazilian population.

All participants gave explicit informed consent, and secondary consent forms were completed to allow for interviewer administration of computer-assisted Web interviews. Institutional review board approval was granted by Essex Institutional Review Board (Lebanon, NJ). A total of 12,000 respondents (1,364 via computer-assisted Web interviews and 10,636 online) gave their informed consent, met the inclusion criteria (aged 18 years or older), and completed the survey instrument (response rate of 4.6% for the 232,063 invited to complete the survey online). Respondents with bipolar disorder, either based on screening criteria from the Mood Disorder Questionnaire [24] or self-reported experience of bipolar disorder, were excluded from analysis. Respondents were included for analysis if they either experienced symptoms of MDD or if they did not report or experience any depression symptoms. A total of n = 9789 respondents were included for analysis (see Fig. 1).

### Measures

#### Major depressive disorder

Respondents were asked within the National Health and Wellness Survey to report whether they experienced depression in the past 12 months, were diagnosed with depression by a physician, and were currently taking a prescription medication for their depression.

The Patient Health Questionnaire 9 (PHQ-9) was used to classify respondents as having MDD or MDD symptoms, or both, and to classify the severity of depression (moderate, moderately severe, or severe) [25,26]. The PHQ-9 is a nine-item screening questionnaire assessing the frequency of reported symptoms of MDD (each rated on a scale of 0 = "not at all" to 3 = "nearly every day"), based on the *Diagnostic and Statistical Manual of Mental Disorders IV* criteria for diagnosing MDD in patients with mental illness. Respondents are identified as having MDD if they select a frequency of "more than half the days" and above (in the last 2 weeks) for five or more of the items, with the caveat that they must select this frequency for at least one of the first two items ("little interest" and "feeling down"), and the last item ("thoughts of suicide/self-harm") is counted even if a frequency of "several days" is selected. The level of depression severity was assessed according to the following total scores: 0 to 4 = "minimal," 5 to 9 = "mild," 10 to 14 = "moderate," 15 to 19 = "moderately severe," and 20 to 27 = "severe."

#### Demographics

Gender (male or female), age (years), marital status (married, single and never married, separated, or divorced), employment status (full time, part time, or self-employed), income (≤R$ 2000), educational attainment (some college or more), and socioeconomic status (A1–A2 [upper class], B1–B2 [middle class], C1 [lower middle class], C2 [skilled working class], D [lower working class], and E [lowest income earners]) were assessed, with C2, D, and E grouped for analysis to reflect the broader lower class, as differentiated from C1 (a growing middle-class segment) and the other classes [27]. These classifications were developed by the National Readership Survey to gather statistics on media audiences (television, radio), and as a way to classify social classes for media outlets. Regional information (north, northeast, center west, southeast, south, or unspecified) was also collected.

#### Health characteristics

Body mass index (obese: ≥30 kg/m$^2$), tobacco smoking status (current smoker), alcohol usage, mean number of days participants exercised in the past month, Charlson comorbidity index scores (0, 1, 2, or 3 and above, indicating increasing degree of comorbid mortality risk) [28], self-reported depression severity