Research paper

Determinants and geographical variation in the distribution of depression in the Southern cone of Latin America: A population-based survey in four cities in Argentina, Chile and Uruguay

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ABSTRACT

Background: Depression is one of the major contributors to the global burden of diseases; however, population-based data in South America are limited.
Methods: We conducted a population-based cross sectional study with 7524 participants, aged 35–74 years old, recruited between February 2010 and December 2011 from randomly selected samples in 4 cities (Bariloche and Marcos Paz, Argentina; Temuco, Chile; and Pando-Barros Blancos, Uruguay). Major Depressive Episode (MDE) was assessed using the Patient Health Questionnaire (PHQ) – 9.
Results: The overall prevalence of MDE was 14.6% (95% CI: 13.6, 15.6). However, there was a geographical variability of up to 3.7 folds between different cities being 5.6% (95% CI: 4.6, 6.7) in Marcos Paz, Argentina; 9.5% (95% CI: 8.2, 10.9) in Bariloche, Argentina; 18.1% (95% CI: 16.3, 20.0) in Temuco, Chile, and 18.2 (95% CI: 16.3, 20.2) in Pando-Barros Blancos, Uruguay. The multivariate model showed that, adjusted by location, being female, being between 35 and 44 years old, having experienced at least one stressful life event, currently smoking, and having a history of chronic medical diseases were independently associated with an increased risk of MDE, while having higher education and being married or living with a partner reduced the risk of MDE.
Limitations: These results are representative of the selected cities included in the study. As such extrapolation to the general populations of Argentina, Chile, and Uruguay should be done with caution
Conclusions: This study showed a high prevalence and variability of MDE in the Southern Cone of Latin America.

1. Introduction

Mental and substance use disorders are major contributors to the global burden of disease and their impact has been rising in the recent years (Whiteford et al., 2013). Five types of mental illness appear within the top 20 causes of global burden of disease (GBD), with major depression being the mental disorder associated with the greatest burden (Global burden of disease, 2015). According to the World Health Organization (WHO) over 350 million people have depression and on average about 1 in 20 people reported having a depressive episode the previous year (Marcus et al., 2012).

Prevalence of depression varies according to the region and

methodology employed in each study. With regards to regional differences, a study employing the same methodology and conducted to determine the rate of major depression in 10 countries, found that depression prevalence is extremely variable with higher values found in Western compared to Eastern countries (Weissman et al., 1996). Regarding methodology, a systematic review of the epidemiological literature including studies from 53 countries found that when depression prevalence was assessed with structure interviews based on either the Diagnostic and Statistical Manual of Mental Disorders (DSM) or the International Classification of Diseases (ICD), the pooled point prevalence was 3.8% (95% CI = 3.1; 4.6), while when using symptom scale instruments, it was 12.1% (95% CI = 9.3; 15.7) (Ferrari et al.,

2013).

There are different symptoms scale instruments available to assess depressive symptoms. The Patient Health Questionare-9 (PHQ-9) is one of the most commonly used instruments not only to detect patients with Major Depressive Episode (MDE) but also to assess the severity of depression in clinical (12) and population based studies (13–16). There is an adapted version of the PHQ-9 in Spanish for Latin America that has been recently validated and calibrated in Argentina by our research team to determine the appropriate cut-off points for assessing diagnosis and degrees of the severity of MDE in the adult population (Urtasun et al., 2017).

Several studies have consistently found some risk factors related to depression, such as sex (more females than males are affected) and age (depression is more frequently found in middle-aged people) (Paykel et al., 2005). However, the variability observed in the prevalence rates for major depression across countries suggests that some cultural differences or environmental risk factors may affect the expression of the disorder (Weissman et al., 1996). Unfortunately, almost two-thirds of the epidemiological studies on depression were conducted in North America or Western Europe (Ferrari et al., 2013) while information from developing regions such as South America is scarce. Since the epidemiology of depression has only been reported for two countries in the region: Brazil (Andrade et al., 2003, 2002; Munhoz et al., 2016; Simon et al., 2002) and Chile (Andrade et al., 2003; Araya et al., 2001) there is an urgent need to conduct more population-based epidemiological studies on depression across countries in Latin America.

In order to reduce this knowledge gap, the aim of the present study was to estimate the prevalence and geographical variability of MDE in the general adult populations in four cities in the Southern Cone of Latin America (Argentina, Uruguay and Chile). We also aimed to evaluate the independent associations of MDE with sociodemographic, behavioral factors, chronic medical illness and stressful life events (SLEs). These results would be beneficial to the development of policies that aim at reducing the mental health burden in the region.

2. Materials and methods

2.1. Study participants

The details of the study design and sampling methods of the CESCAS I study have been published previously (Rubinstein et al., 2011). Briefly, 7524 women and men aged 35–74 years old, were recruited between February 2010 and December 2011 from randomly selected samples in 4 mid-sized cities in the Southern Cone of Latin America: two cities located in Argentina (Bariloche and Marcos Paz), one in Chile (Temuco), and one in Uruguay (Pando-Barros Blancos). Marcos Paz and Pando-Barros Blancos are small cities with 54,000 and 58,000 residents, respectively, according to the latest census data. Bariloche (Argentina) and Temuco (Chile) are larger cities with 134,000 and 245,000 residents, respectively, according to the latest census data. Only the urban populations were included from these sites. These study locations were selected based on population characteristics reflecting country averages. In addition, all four locations have demonstrated stable populations with migration rates below 10% over the past 10 years. A four-stage stratified sampling method was used to select a representative sample from the general population of the Southern Cone of Latin America (Levy and Lemeshow, 2008). In the first stage, census radii were randomly selected from each of the four locations, stratified by socio-economic level. In the second stage, a number of blocks proportional to the radius size were randomly selected. In the third stage, households within each block were selected by systematic random sampling. All members between the ages of 35 and 74 in the selected households were listed to create the study sampling frame. In the final stage of sampling, one listed member per household was randomly selected to be included in the study.

Of the 10.254 individuals randomly selected, 550 were never found

at their homes and 1.394 refused to participate. Of those 8310 who completed the home surveys, 786 did not attend the clinical examination. Thus, the final sample for this analysis includes 7.524 participants (3.165 men and 4.359 women). The overall response rate was 73.4%, and the response rates were similar in men and women and across different locations.

The study complies with the Declaration of Helsinki. The study protocol was approved by IRBs in all participating institutes in Argentina, Chile, Uruguay and the US and written informed consent was obtained from all study participants.

2.2. Data collection

Study data were collected during a home visit and a clinical visit. Depression was measured during the home visits, using the PHQ-9. The PHQ-9 is a nine-item self-reported scale, developed to diagnose MDE as well as assess the severity of depressive symptoms during the two weeks prior to data collection in primary care settings and the community. The definition of an MDE according to the PHQ-9 is based on the DSM-IV diagnostic criteria, which considers at least 2 weeks of persistent depressed mood or anhedonia, accompanied by a total of at least 5 or more of the 9 DSM-IV symptoms of major depression during the episode (significant weight change [5%] or change in appetite; change in sleep [insomnia or hypersomnia]; change in activity [psychomotor agitation or retardation]; fatigue or loss of energy; feelings of worthlessness or excessive or inappropriate guilt; diminished ability to think or concentrate or more indecisiveness; and thoughts of death or suicide) (Kroenke et al., 2001). Each question in the PHQ-9 has four response choices: "not at all", "several days", "more than half the days", and "nearly every day". This instrument has been validated and calibrated in Argentina (Urtasun et al., 2017). Two scoring systems have been proposed for the PHQ-9 (Kroenke et al., 2001) in the present study, the continuous score was employed by adding up the responses to the nine questions. This way of using the PHQ-9 allowed for the assessment not only of the diagnosis but also of the severity of depressive symptoms, the score ranging from 0 to 27. The cut-off point of ≥ 8 used to determine MDE was based on the calibration of this instrument by our group (Urtasun et al., 2017). Regarding the severity, the cut-off points for depressive symptoms were 6–8 for mild, 9–14 for moderate and ≥ 15 for severe depression (Urtasun et al., 2017).

During the home survey, other information on demographic characteristics, including age, sex, education, occupation, and lifestyle risk factors, including cigarette smoking, alcohol consumption, and physical activity was obtained using standard questionnaires. Religious practice was defined as attending religious services at least once a week. Stressful life events (SLEs) were determined by asking participants whether they had experienced stressful life events in the past year such as marital separation or divorce, loss of job or retirement, loss of crop or business failure, violence, major intra-family conflict, major personal injury or illness, death or major illness of a close family member, death of a spouse, or other major stress (Rosengren et al., 2004, 2015). Quality of life was assessed by Mental Health and Physical Composite Scale scores derived from the locally validated version of the SF-12 (Augustovski et al., 2008).

During the clinical examination, blood pressure (BP) and anthropometric measurements were obtained by trained and certified observers using the standard protocols and techniques described previously (Pickering et al., 2005). Hypertension was defined as mean systolic BP ≥ 140 mm Hg, and/or diastolic BP ≥ 90 mm Hg, and/or current use of antihypertensive medications. Obesity was defined as a body-mass index (BMI) ≥ 30 kg/m^2, and overweight as BMI ≥ 25 kg/m^2 (Grundy et al., 2005). Diabetes was defined as fasting glucose $\geq$ 126 mg/dL or self-reported history of Diabetes (2014).