



Research report

Late-life depressive symptoms: Prediction models of change



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ABSTRACT

Background: Depression is a well-recognised problem in the elderly. The aim of this study was to determine the factors associated with predictors of change in depressive symptoms, both in subjects with and without baseline significant depressive symptoms.

Methods: Longitudinal study of community-dwelling elderly people (> 60 years or older), baseline evaluations, and two additional evaluations were reported. Depressive symptoms were measured using a 30-item geriatric depression scale, and a score of 11 was used as cut-off point for significant depressive symptoms in order to stratify the analyses in two groups: with significant depressive symptoms and without significant depressive symptoms. Sociodemographic data, social support, anxiety, cognition, positive affect, control locus, activities of daily living, recent traumatic life events, physical activity, comorbidities, and quality of life were evaluated. Multi-level generalised estimating equation model was used to assess the impact on the trajectory of depressive symptoms.

Results: A number of 7882 subjects were assessed, with 29.42% attrition. At baseline assessment, mean age was 70.96 years, 61.15% were women. Trajectories of depressive symptoms had a decreasing trend. Stronger associations in those with significant depressive symptoms, were social support (OR.971, $p < .001$), chronic pain (OR 2.277, $p < .001$) and higher locus of control (OR.581, $p < .001$). In contrast for those without baseline significant depressive symptoms anxiety and a higher locus of control were the strongest associations.

Conclusions: New insights into late-life depression are provided, with special emphasis in differentiated factors influencing the trajectory when stratifying regarding basal status of significant depressive symptoms.

Limitations: The study has not included clinical evaluations and nutritional assessments.

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1. Introduction

Depression in the elderly is a major public health problem, that causes suffering for many, who often go undiagnosed, and untreated, and it burdens families, and institutions that provide care for the elderly by disabling those people who might otherwise be able-bodied (Wagner et al., 2012). A World Health

Organization (WHO) report attributed 32% of all years lived with disabilities to neuropsychiatric conditions: the major contributor to this proportion was unipolar depression (11.8%) (Mathers and Loncar, 2006). Depression also predicts the onset, and progression of both physical, and social disabilities, particularly in the elderly (Bruce et al., 1994; Penninx et al., 1998), and it results in higher health service utilisation rates (García-Peña et al., 2008). In Mexico, the prevalence of depressive symptoms in the elderly was estimated at approximately 20% (García-Peña et al., 2008). In addition, depressive symptoms were reported to be strongly associated with the same adverse outcomes observed in subjects with clinical depression (Penninx et al., 1998). Moreover, prognostic implications were reported in already depressed subjects (Bruce et al., 1994). In contrast, in a recent report, a depression

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intervention in elderly Mexican subjects, which was aimed to be cost-effective, decreased disability at a low cost (Salomon et al., 2012), a major achievement in a limited-resource setting.

One problem that makes depressive symptoms in the elderly so insidious is that often neither the person nor the health care provider recognises the symptoms in the context of the multiple physical problems, and comorbidities; moreover, health care professionals often conclude that depressive symptoms are a normal consequence of these problems, an attitude that is often shared by the patients themselves (stigma) (Conner et al., 2010; Perez-Zepeda et al., 2012). These factors conspire to make depressive symptoms go underdiagnosed, and more importantly, under-treated (Nyunt et al., 2009). Other barriers to receiving care for depressive symptoms can be imputed to negative life events, with a trend among health care professionals towards attributing affective problems to these events, and not treating them as a clinical problem (Kraaij et al., 2002).

Some reports have analysed the differences in presentation, and clinical outcomes among depressed elderly patients (Cole, 2002; Murphy, 1983; Solomon et al., 1997). However, more knowledge about how these symptoms change over time among community dwelling elderly people is needed. These changes in affect have been hypothesised to interact closely with health, and social factors (i.e., high morbidity, lower functioning, less social participation, more severe depression) (Mirowsky and Ross, 1992). Different approaches have been used to study depressive symptom trajectories in the elderly. One of the more widely used is that of latent class trajectories to compare groups classified by their depressive symptom trajectories. A number of different reports have agreed that, in general, four categories of depressive symptoms exist, with the majority of elder subjects classified with “low depressive symptomatology” (48.6–76.6%), and three other categories of elderly subjects with significant depressive symptomatology (Byers et al., 2012; Cui et al., 2008; Huang et al., 2011; Kuchibhatla et al., 2012; Lincoln and Takeuchi, 2010). Depressive symptoms depend on a wide range of factors, and not only depression alone. Self-esteem, social support, and comorbidity, among other factors, can produce modifications in self-perception, and reporting of depressive symptoms over time (Bryant et al., 2012). To represent those trajectories, and to identify other factors (biological, psychological, and social), the aim of this study was to determine the differential impacts of multiple factors on the trajectories of depressive symptoms.

2. Methods

2.1. Sample and design

The data reported here are from the “Integrated Study of Depression Among the Elderly,” a population-based, longitudinal study of risk factors for depression in Mexicans aged 60 years, and older, who are beneficiaries of the largest social security system in Mexico (*Instituto Mexicano del Seguro Social-IMSS*). The preliminary cross-sectional results, methods, and sampling processes were described elsewhere (García-Peña et al., 2008).

In this baseline assessment 7449 subjects were interviewed, of whom 21.7% had significant depressive symptoms. To perform a stratified analysis of factors associated with depressive symptom trajectories between those subjects with significant depressive symptoms, and those without these symptoms, an identical number of subjects without significant depressive symptoms at baseline was randomly selected, and was followed up, along with the other group.

Sample weights were estimated using probabilities defined through the stratified sampling, and the probability of being

screened as positive for depressive symptoms. The expansion factor was then calculated as the inverse of the sample weights. A thorough explanation of the sampling and weighting procedures are presented in additional material.

2.2. Procedures

Trained and standardised interviewers conducted face-to-face interviews at the participants' home during every stage of the study. All of the measurements were assessed at the baseline visit, and at the two follow-up visits (12-month apart). Attempts were made to reach the subjects at each stage; three causes of loss to follow-up were recorded: death, rejection, and not found.

2.3. Measurements

Depressive symptoms were assessed using the 30-item geriatric depression scale (GDS 30) (Fernández-San Martín et al., 2002; Yesavage et al., 1982). The GDS 30 was developed for older persons, and it has been widely used in different settings (Boult et al., 2001; Rapp et al., 1988; Sharp and Lipsky, 2002), including the Mexican population (Sánchez-García et al., 2008). A score of 11 points or higher was considered as significant depressive symptoms (sensitivity 92%–specificity 89%, compared to depression) (García-Peña et al., 2008; Lyness et al., 1997; Montorio and Izal, 1996); accordingly the stratification was: with significant depressive symptoms (GDS 30 score of 11 or greater), and without significant depressive symptoms (GDS 30 score of 10 or less). The internal consistency (Cronbach's alpha) of the GDS 30 was 0.916 at the basal assessment, and it was 0.927, and 0.918, respectively, for the two subsequent stages.

Variables were classified in four categories: social (age, scholarship, marital status, living alone, number of friends and relatives, religion, and social support); lifestyle (remunerated activity, exercise, activities, smoking, alcohol drinking, and use of illicit drugs or psychotropic medicines); health (health care use, cognition, anxiety, activities of daily living, comorbidities, quality of life, and use of antidepressants); and psychological (negative life events, positive affect, and locus of control).

A validated Spanish version of the Social Support Scale was used, which included 19 items that explore the frequency of receiving social support in different domains; it scores each item from zero (never) to four points (always), and the total score is the sum of each item, with zero the lowest score, and 76 the highest (best social support) (Revilla-Ahumada et al., 2005; Sherbourne and Stewart, 1991).

A single question was asked to explore whether the subjects engaged in remunerated activities or exercised regularly. In addition, an average of daily activities (24-activity list) was obtained by asking the number of days per week the subjects performed the activity, and the approximate number of hours per day devoted to them.

Current smoking status was assessed by a single question. Alcohol drinking was defined as the self-reported average ingestion of more than one glass of an alcoholic beverage per day (Dawson et al., 2005). The use of different substances was recorded with a question of whether the subject had ever used illicit drugs (amphetamines, marijuana, cocaine, heroin, hallucinogens, and inhalants) or psychotropic medicines (opioids, benzodiazepines, barbiturates).

Health care utilisation was assessed using an incremental questionnaire, ranging from family practice consultation (number of visits) to third-level hospital usage (number of times using any service) in the last year. Comorbidities were assessed by self-reporting, a variable was created to indicate whether the subject had more than two. Regarding depression treatment, the use of

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