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Prevalence of depression in patients with type 2 diabetes attended in primary care in Spain



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ABSTRACT

Objectives: To estimate the prevalence of known and undiagnosed depression in patients with type 2 diabetes attended in primary care setting in Spain, and to determine the factors associated with the presence of depression.

Methods: This was a cross-sectional and multicenter study performed in a random sample of patients with type 2 diabetes attended in 21 primary care centers. Depressive symptoms were measured with the self-administered Patient Health Questionnaire (PHQ-9).

Results: A total of 411 patients were analyzed (mean age 70.8 (SD 10.3) years; 53.8% women). 29.2% of patients met the diagnostic criteria of depression, of whom 17% had known depression and 12.2% undiagnosed depression (PHQ-9 score ≥ 10 , without a previous diagnosis of depression). Depression was more common in women (43.4%; 95% confidence interval [CI] 34.5–52.3%), widow (33.3%; 95% CI 27.9–38.7%), and hypothyroidism (12.5%; 95% CI 8.7–16.3%). Cardiovascular risk factors, the degree of control, complications related to diabetes, antidiabetic therapy and the number of drugs were not associated with the presence of depression.

Conclusions: The prevalence of depression was high in patients with type 2 diabetes. However, in approximately 40% of patients depression was undiagnosed. The complications related to diabetes and antidiabetic therapy were not associated with the presence of depression.

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¹ The members of the working group of diabetes SEMERGEN participating in the study are listed in [Appendix 1](#).
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1. Introduction

Type 2 diabetes mellitus and depression are two conditions very common in the general population. In Spain, the prevalence of type 2 diabetes is approximately 13% [1] and around 10.5% of the subjects have had at least one depressive episode during their lives [2].

The concomitance of both entities is common. Thus, compared with individuals without diabetes, the risk of depression is almost double in patients with type 2 diabetes [3]. Similarly, patients with type 2 diabetes have a higher risk of developing depression [4]. In Spain the prevalence of depression in patients with type 2 diabetes ranges from 15% to 32% [5,6]. However, these studies were not performed in primary care setting and were limited to specific geographic areas.

Subjects with type 2 diabetes and depression have a worse glycemic and other cardiovascular risk factors control [7,8]. This may be associated with a poor self-care, including a lesser physical activity, unhealthy diet or a lesser adherence to medication [9]. Compared with subjects without depression, patients with type 2 diabetes and major depression have a higher risk of either micro and macrovascular complications [10], as well as cognitive impairment [11], regardless the previous medical history or treatments. In addition, patients with diabetes and depression exhibit higher ambulatory care use and fill more prescriptions than their counterparts without depression. In fact, total health care expenditures for diabetics with depression are 4.5 times higher than that for diabetics without depression [12,13].

On the other hand, different studies have shown that compared with those individuals without depression, in those patients with type 2 diabetes and depression, all-cause mortality is increased by about 50% [8,14,15]. Moreover, it has been reported that cardiovascular mortality is increased in women with type 2 diabetes and depression [16].

However, the current prevalence of depression in patients with type 2 diabetes attended in primary care setting in Spain is not well known. This study was designed to estimate the prevalence of known and undiagnosed depression in patients with type 2 diabetes attended in primary care setting in Spain, and to determine the factors associated with the presence of depression.

2. Patients and methods

This was a multicenter, descriptive and cross-sectional study performed in a random sample of patients with type 2 diabetes attended in 21 primary care centers from 12 out of 17 Autonomous Communities of Spain. The selection of primary care centers was performed by convenience. Patients >35 years old, with an established diagnosis of type 2 diabetes attended in primary care setting in Spain in the last 12 months were included in the study. Patients exclusively attended by specialists, with other type of diabetes, cognitive impairment, advanced disease, or unable to perform or understand the *Patient Health Questionnaire* (PHQ-9), as well as those individuals who refused to participate, were excluded from the study. The recruitment was performed between August 2014

and February 2015. The study was approved by the Clinical Research Ethics Committee of the Primary Care Investigation Institute IDIAP Jordi Gol from Barcelona. All patients were required to sign the written informed consent before inclusion, once they had read and perfectly understood the patient information sheet.

The study comprised a single visit that coincided with one of the patient's regular follow-up visits. The data were collected from the medical history and physician interview. All patients included in the study fulfilled the self-administered PHQ-9 test. No study-specific diagnostic or therapeutic intervention was performed.

2.1. Patient Health Questionnaire (PHQ-9)

The PHQ-9 is a multiple-choice self-report questionnaire designed to establish the diagnosis of depression according to the Diagnostic and Statistical Manual of Mental Disorders (DSM)-IV criteria [17]. The Spanish version of this questionnaire has been validated, with a diagnostic validity comparable to the original English version [18]. This questionnaire has 9 items, each of which is scored 0 (not at all) to 3 (nearly every day), providing a 0–27 severity score. Cut points of 5, 10, and 15 represent mild, moderate, and severe levels of depressive symptoms, respectively; a cut point of 10 or higher allows the diagnosis of major depression. The psychometric properties of the test have been evaluated in patients with diabetes, with a mean sensitivity of 82% and specificity of 68% [19].

2.2. Data collection of patients

The investigators fulfilled a form specifically designed for this study. The data were taken from the electronic clinical history of every patient. When a variable was lacking, this was recorded during the interview.

The following variables were collected: sociodemographic data (age, sex, education level, marital status, occupation, and habitat), time of evolution of diabetes, physical examination (body mass index, systolic and diastolic blood pressure), cardiovascular risk factors, complications related with diabetes (macro and microvascular), other comorbidities, active diagnosis of depression, antidiabetic treatments, and the degree of control. In addition, HbA1c levels and the lipid profile were also recorded from a blood sample taken in the last year. Adequate diabetes, cholesterol and blood pressure control were defined as HbA1c <53 mmol/mol (7%), LDL-cholesterol <2.56 mmol/L (100 mg/dl) and blood pressure <140/90 mmHg, respectively.

2.3. Statistical analysis

The sample size was calculated based on the main endpoint of the study. Thus, considering a confidence interval of 95%, a precision of 5%, given the proportion of the parameter analyzed the value that maximizes the sample size ($p=0.5$) and an estimated loss rate of 10%, the calculated sample size was 422 patients.

For the descriptive analysis, quantitative variables were described with measures of central tendency and dispersion (mean and standard deviation) and qualitative variables were described as absolute (n), and relative (%) frequencies and 95% confidence interval (CI). In the bivariate analysis, to

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