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Demographic, clinical and psychosocial factors identify a high-risk group for depression screening among predominantly Hispanic patients with Type 2 diabetes in safety net care☆

Kathleen Ell, D.S.W. [a,*], Wayne Katon, M.D. [b], Pey-Jiuan Lee, M.S. [a], Jeffrey Guterman, M.D., M.S. [c], Shinyi Wu, Ph.D. [a,d,e]

[a] School of Social Work, University of Southern California
[b] Department of Psychiatry and Behavioral Sciences, University of Washington
[c] David Geffen School of Medicine at UCLA and the Los Angeles County Department of Health Services
[d] Edward R. Roybal Institute on Aging, University of Southern California
[e] Daniel J. Epstein Department of Industrial and Systems Engineering, University of Southern California

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ABSTRACT

Objective: Identify biopsychosocial factors associated with depression for patients with Type 2 diabetes.
Method: A quasi-experimental clinical trial of 1293 patients was predominantly Hispanic (91%) female (62%), mean age 53 and average diabetes duration 10 years; 373 (29%) patients were depressed and assessed by Patient Health Questionnaire-9. Demographic, baseline clinical and psychosocial variables were compared between depressed and nondepressed patients.
Results: Bivariate analyses found depression significantly associated ($p<0.05$) with female gender, diabetes emotional burden and regimen distress, BMI ≥30, lack of an A1C test, diabetes duration, poor self-care, number of diabetes symptoms and complications, functional and physical characteristics (pain, self-rated health condition, Short-Form Health Survey SF-physical, disability score and comorbid illnesses), as well as higher number of ICD-9 diagnoses and emergency room use. A multivariable regression model with stepwise selection identified six key risk factors: greater disability, diabetes symptoms and regimen distress, female gender, less diabetes self-care and lack of A1C. In addition, after controlling for identified six factors, the number of psychosocial stressors significantly associated with increased risk of depression (adjusted odds ratio=1.37, 95% confidence intervals: 1.18–1.58, $p<.0001$).
Conclusion: Knowing biopsychosocial factors could help primary care physicians and endocrinologists identify a high-risk group of patients needing depression screening.

1. Introduction

Health disparities in minority populations are well recognized. While recent analyses of nationally representative data from 1980 to 2012 suggest a doubling of the incidence and prevalence of diabetes during 1990–2008 and a plateauing between 2008 and 2012, continued increases were found among non-Hispanic Black and Hispanic populations [1]. Hispanics, the largest ethnic minority group in the United States, have been found to have the highest lifetime risk of diabetes and significantly high rates of comorbid depression [2–4]. Prevalence estimates indicate that having diabetes is associated with a twofold higher risk of comorbid depression compared to the general population, with rates among Hispanics as high as 33% [5]. Relative to White Americans, Black and Hispanic Americans are more likely to experience persistent depressive symptom trajectories [6–8]. Thus, there is a need for ongoing enhanced socioenvironmental resources that support diabetes self-management, emotional well-being and glycemic control in this safety net population [9–11].

At the same time, growing evidence identifies significant relationships, including bidirectional associations [12–15], between depression and diabetes. These interactions are influenced by biological, psychological, socioeconomic factors and negative life events [4,16,17]. Depression early in life increases risk of development of Type 2 diabetes by about 60% and diabetes increases risk of depression by approximately 15% [18,19]. There is also evidence that coexistence of diabetes and depression is associated with increased risk of morbidity, mortality and higher medical utilization and healthcare costs [20–25]. Given the evidence that comorbid depression is associated with poor self-care (such as adherence to diet, exercise regimens and disease control medications) in patients with diabetes, the American Diabetes Association

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* Corresponding author at: School of Social Work, MRF 214 (MC 0411), University of Southern California, Los Angeles, CA, 90089-0411. Tel.: +1-760-399-0263; fax: +1-213-821-4022.
E-mail addresses: ell@usc.edu (K. Ell), wkaton@u.washington.edu (W. Katon), peylee@usc.edu (P.-J. Lee), JGuterman@dhs.lacounty.gov (J. Guterman), shinyiwu@usc.edu (S. Wu).

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recommends screening for depression in high-risk patients [26]. However, screening all patients with diabetes is potentially time consuming and costly, so targeting screening to the highest risk populations is important.

In this secondary analysis, we aim to assess demographic and clinical variables associated with depression in this low-income, predominantly Hispanic population of patients with diabetes in order to identify patients that systems of care could target for screening. We hypothesize that after controlling for all the other demographic and clinical risk factors found to be statistically significant associated with depression jointly, the number of psychosocial stressor domains is significantly associated with increased risk of depression based on our previous studies of depression and diabetes, cancer and heart disease [27–29].

2. Methods

2.1. Study population, sampling and design

Patients were recruited by the Diabetes–Depression Care–Management Adoption Trial (DCAT). The trial was a quasi-experimental comparative effectiveness clinical trial conducted on predominantly Hispanic patients with Type 2 diabetes in collaboration with the Los Angeles County Department of Health Services (DHS) at eight county-operated clinics comparing three delivery models in three groups: usual care (UC), supported care (SC) and supported and technology-facilitated care (TC) [30,31]. DCAT was approved by the University of Southern California, Olive View UCLA Medical Center and the Los Angeles Biomedical Research Institutional Review Boards. Bilingual study recruiters identified 1725 adult patients, 18 years or older, with Type 2 diabetes from medical charts; 1704 (98.8%) were screened. A screening protocol was administered to exclude patients with current suicidal ideation, cognitive impairment (Short Portable Mental Status Questionnaire correct score <5) [32], alcohol abuse (2 or more "yes" responses in CAGE questions, the name of which is an acronym of its four questions) [33] plus a single screening question on recent use of lithium or antipsychotic medication. Through this eligibility screening, 101 patients were excluded and 1603 were study eligible. During April 2011 to May 2012 recruitment period, 1475 patients provided written informed consent (92% enrollment rate), and 1406 patients completed a structured baseline interview that included the Patient Health Questionnaire-9 (PHQ-9) depression symptom assessment [34].

DCAT is a translational study consistent with current evidence-based clinical recommendations about depression screening and treatment. The UC group includes two community clinics and represents the status quo of clinical practice, where the translation and adoption of depression care evidence is performed by the primary care physicians (PCPs) and their staff. The SC and TC groups each include two care teams of the DHS diabetes disease management program (DMP). These teams practiced in two community clinics and one hospital-based outpatient clinic. The DMP's practice model uses team staff (i.e., physicians, nurse practitioners, nurses and social workers) acquainted with guidelines and protocols to support diabetes, congestive heart failure and asthma care management for high-risk or high-utilization patients. DCAT TC model equipped with automated telephonic assessment system that screened nondepressed patients quarterly to facilitate early detection of depression and monitored depressed patients monthly. The PHQ-9 was found to have acceptable diagnostic properties for detecting major depressive disorder for cutoff scores between 8 and 11 [35]. The cutoff score of 8 was used in DCAT for patients receiving monthly depression monitoring calls.

At completion of baseline interview, all patients (depressed and nondepressed) were given English or Spanish patient- and family-focused depression educational materials (including a comic book depression *fotonovela*) designed specifically for people with low health literacy and a community, financial, social services, transportation and child care resource list. Study clinic physicians were notified of baseline depression screening results for patients who had clinically significant major depression or who expressed suicidal ideation more than half the days in the last 2 weeks. SC and TC PCPs applied the DHS collaborative Depression Care Protocol. UC PCPs could prescribe antidepressants or refer patients to community mental healthcare when needed. Patients could also independently seek mental health treatment.

Of 1406 DCAT participants, 373 patients were classified as depressed (endorsed at least one of the cardinal symptoms depressed mood or loss of interest more than half the days in the past 2 weeks and also scored ≥8 on the PHQ-9). Among nondepressed patients, 113 patients reported receiving treatment for depression (33 with professional counseling plus antidepressant, 5 with only depression consultation and 75 with antidepressant only). These 113 patients were excluded from data analysis because they were treated for depression and had a low depression score. Thus, the analytical sample size included 1293 patients.

2.2. Data collection

The complete set of data collection instruments is described in detail elsewhere [30]. Depression was assessed using the PHQ-9 [34]. Health-related quality of life was measured using the physical and mental component summary from SF-12 Short-Form Health Survey [36]. Disability was assessed using the Sheehan Disability Scale (SDS), which rates impairment on a 10-point Likert Scale (10 indicating inability to carry out work and social roles) [37]. Diabetes symptoms were assessed using the Whitty 9-item questionnaire [38], which has been demonstrated to change over time with effective diabetes treatment. Glycated hemoglobin A1C was obtained from medical records, reported both in National Glycohemoglobin Standardization Program (NGSP) A1C (%) and the International Federation of Clinical Chemistry (IFCC) Working Group developed worldwide IFCC (mmol/mol) units [39]. Diabetes emotional burden and regimen-related distress were assessed by a brief diabetes distress instrument DDS-2 [40], and the response score ≥3 highlights a level of distress. The Summary of Diabetes Self-Care Activities Questionnaire was used to measure self-reported adherence [41]. Also assessed were BMI from self-reported weight and height, self-reported diabetes complications (vision problem, kidney problem, loss or decrease of feeling in feet or legs, foot ulcer or infection, amputation, sexual impairment, heart attack or cardiac procedure to clear up blocked vessel, e.g., stent, bypass), self-reported comorbid medical illness (hypertension, heart disease, arthritis, retinopathy, gastrointestinal, kidney, lung disease, stroke, cancer, urinary tract or prostate problem) and psychosocial stressor (four domains created from financial situation and 10-item Hispanic Stress Inventory [42] — work/employment, financial problems, marital/family conflicts, cultural conflicts and immigration issues). ICD-9 diagnosis and healthcare utilization [clinic visits, emergency room (ER) use and hospitalization] during 6 months before study participation (prebaseline) were obtained from DHS electronic medical records.

2.3. Statistical analysis

A total of 1293 patients were included in the study. Simple descriptive statistics (percentage, mean and standard deviation) of demographic and clinical variables were reported stratified by absence and presence of depression (having depressed mood or loss of interest symptom more than half the days in the past 2 weeks and scoring ≥8 on the PHQ-9). Baseline and prebaseline data (i.e., ICD-9 diagnosis and healthcare utilization (clinic visits, ER use and hospitalization) during 6 months before study participation) were compared between depressed and nondepressed patients with independent *t* test for continuous variables and Pearson chi-square test for categorical variables. To identify patient characteristics of a depression high-risk group, all independent demographic and clinical variables found to be statistically significant associated with depression at the univariate level were entered into a logistic regression model with stepwise selection to allow for the examination of a collection of models which might not otherwise have