

## DEPRESSION AMONG HISPANIC WOMEN WITH TYPE 2 DIABETES

Zara C. Shah; Fatma G. Huffman

**Objective:** Investigate psychosocial barriers to self-care and the prevalence of depression among Hispanic women with type 2 diabetes.

**Research and Design Methods:** One hundred twenty-six (126) Hispanic women living in Miami-Dade, South Florida were recruited through outpatient diabetes clinics, physicians' offices, or community referrals to participate in a cross-sectional survey to assess psychosocial factors that can interfere with type 2 diabetes self-care. The survey collected information on sociodemographics, performance of self-care regimens, a diabetes care profile (support, knowledge, empowerment, and attitudes), depression (Beck Depression Inventory-II), health locus of control, and perceived stress, as well as other data used to evaluate diabetes status.

**Results:** Only 4 of the 126 diabetic women interviewed reported having had depression previously assessed. Mean for depression scores was  $12.76 \pm 8.71$ . Scores on the depression inventory indicated depression in 40.6% of subjects, with 23% categorized as mildly, 11.1% moderately, and 6.3% severely depressed. Greater self-assessed depression was associated with poorer self-rated health, understanding of diabetes, and diabetes knowledge scores. Subjects classified as severely depressed had lived with diabetes for a significantly longer mean number of years than those classified as moderately, mildly, or minimally depressed.

**Conclusions:** Depression had not been previously assessed by any healthcare providers seen by participants or addressed in most participants in this study. While the literature abounds with findings on the depression in diabetes and potential for improved compliance when depression is treated, this concept seems to not yet be adopted into mainstream diabetes care for our Hispanic population. (*Ethn Dis.* 2005;15:685-690)

**Key Words:** Depression, Hispanic, Diabetes

From the College of Health and Urban Affairs, Florida International University; Miami; Florida.

Address correspondence and reprint requests to Fatma G. Huffman, PhD, RD;

### BACKGROUND

A major contributing factor in the increase in diabetes-related mortality may be the lack of specialty care, especially among minorities who may be less likely to seek or have access to specialty care.<sup>1</sup> Specialty diabetes treatment entails comprehensive care from a specially trained diabetes care provider or a team of healthcare professionals who can address psychosocial as well as clinical aspects of disease management. Although the American Diabetes Association<sup>2</sup> emphasizes that meeting the specific medical and psychosocial needs of the diabetes patient and accommodating changes in his or her life are paramount in promoting self-care, many diabetes patients have little or no attention paid to their psychosocial state. Lack of social support, disease severity, and the daily demands of disease management may greatly influence the patient's sense of mastery and self-esteem, which in turn can lead to depression.<sup>3</sup> Depression has been strongly linked to hyperglycemia and increased risk for complications; increases in morbidity and mortality have been observed in relation to both major and minor depression even after adjustment for health status and behaviors.<sup>4</sup>

In the United States, depression is estimated to be three to four times more prevalent among diabetic individuals (20.5%) than in the nondiabetic (11.4%) population.<sup>4</sup> Patients' attitudes,

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and coping disposition, and general psychological state can significantly affect their management of the disease.<sup>5</sup> Psychological state may be particularly relevant to successful self-care in a disease like diabetes, which is largely controllable with careful attention to prescribed regimens.<sup>5</sup> Poor adherence to diabetes regimens, poor glycemic control, and increased risk of complications such as coronary heart disease and retinopathy are consistently associated with depression among diabetes patients.<sup>6,7</sup> Lustman et al<sup>8</sup> reported that 64% of patients with limited and inconsistent medical follow-up had recurring depression and that treatment with antidepressants significantly improved glycemic control in the short-term. However, the etiology of depression in diabetes patients is difficult to pinpoint since depression may stem from organic routes, relate to concern over complications, or involve a combination of both.<sup>9</sup>

The Florida Department of Health ranks diabetes as the 7th leading cause of death and estimates that about one million (7%) adult Floridians have been

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HLS 437, Department of Dietetics and Nutrition, College of Health and Urban Affairs, Florida International University; University Park; Miami; FL 33199; 305-348-3788; 305-348-1996; huffman@fiu.edu

diagnosed with diabetes while another three to four hundred thousand remain undiagnosed.<sup>10</sup> Racial and ethnic minorities (Blacks, 13.7%; Hispanic non-Blacks, 7.2%) experienced a higher prevalence of diabetes than White non-Hispanics (5.9%), and minorities also tended to have a higher incidence of complications with poor outcomes like nerve damage, renal and cardiovascular diseases, and amputations.<sup>10,11</sup> Hispanics, the fastest growing ethnic minority (12%) in the United States, experience the same mortality related to diabetes mellitus (DM) as the general population. However, while diabetes is the 8th leading cause of death among Hispanic males, it is the 4th leading cause of death among Hispanic females for all ages.<sup>12</sup> While some studies have attempted to assess the interactions among psychosocial, physiological, and environmental factors that may influence the successful management of a chronic disease such as DM, no studies have attempted to address these factors among Hispanic women, despite the documentation of poorer access to health care and increased risk of poor diabetes outcomes in this population. The major aim of our study was to identify and evaluate the effect of selected psychosocial factors on diabetes self-care among Hispanic women with type 2 diabetes.

## METHODS

Once the Institutional Review Board at Florida International University (FIU) had approved the study, participants,  $N=126$ , for 80% statistical power in analyses,<sup>13</sup> were recruited in Miami-Dade, Florida from various local outpatient diabetes clinics (with the pertinent permissions), churches, and through a university-wide email sent to faculty, staff and students at FIU. Additional participants were recruited by flyers posted on notice boards in local supermarkets, restaurants, and other places frequented by the general public,

as well as referrals from individuals who had already participated in the study. Eligible participants were 18 years and older, diagnosed with type 2 DM, had recent (<6 months) glycosylated hemoglobin (HbA1C) evaluation, were receiving current medical treatment for type 2 diabetes, not pregnant or lactating, and were able to understand and complete all study requirements.

The data collection package was administered for each subject in a scheduled individual interview. Assessment of depression was performed by using the Beck Depression Inventory-II (BDI-II), a 21-item instrument for which each item relates to a symptom of depression.<sup>14</sup> Each item was scored on a four-point scale (0–3) with the exception of items 16 and 18, which presented seven options indicating degree of increase or decrease in appetite and sleep. The thresholds suggested by the instrument's authors included 0–13 for the minimal depression range, 14–19 for mild, 20–28 for moderate, and 29–63 for severe. The BDI-II was selected because of its reported ability to differentiate depressed from nondepressed patients and coefficient  $\alpha$  of .92 in outpatients.<sup>14</sup> Beck et al<sup>14</sup> reported that validation of the BDI-II in minority populations was lacking, and their validation study ( $N=500$ ) included only 1% Hispanic participants. No other studies reporting validation of this instrument in Hispanic populations have been published. Other diabetes-related questionnaires were administered to collect data to be evaluated in assessing diabetes self-care. The Diabetes Care Profile (assessed diabetes status and performance of self-care regimens), Diabetes Empowerment Scale obtained from the Michigan Diabetes Research and Training Center,<sup>15</sup> and the Diabetes Knowledge Test obtained from the Starr County Diabetes Education Study<sup>16</sup> were self- or researcher-administered in Spanish or English per the preference of the participant. The same was true for the standardized psychosocial inventories

used: the Beck Depression Inventory-II,<sup>14</sup> the Perceived Stress Scale,<sup>17</sup> and the Multidimensional Health Locus of Control.<sup>18</sup> The Perceived Stress-10 (PSS-10) was a 10-item scale designed to evaluate the respondent's assessment of the unpredictability, lack of control, and overload experienced over the previous week. No specific validation studies in minority populations have been published, but studies have been conducted with college students and a heterogeneous sample enrolled in a smoking cessation program; an internal reliability  $\alpha$  of .78 was found.<sup>19</sup>

All data were entered into the Statistical Package for the Social Sciences (SPSS Inc, Chicago, Ill), Version 11 for Windows.<sup>20</sup> Univariate analyses were performed to produce a general descriptive profile of the subjects based on their sociodemographic characteristics, diabetes self-care scores, and scores on psychosocial measures (depression, stress, empowerment, and health locus of control). Pearson correlations ( $P<.05$ ) were conducted to measure within-subject associations between glycemic control (assessed by HbA1C) and psychosocial variables, with scatterplots to illustrate relationships between variables. Analyses of variance (ANOVA), significance indicated at  $P<.05$ , and Bonferroni post hocs were used to compare groups categorized by depression scores for means on perceived stress, empowerment, and diabetes knowledge scores among groups defined by age, BMI, educational level, marital status, and various categorized variables. Independent-samples  $t$  tests ( $P<.05$ ) were used to compare participants grouped by the presence (score 14–63) or absence (score <14) of depression.

## RESULTS

The results presented are based on analyses of data provided by 126 women of predominantly Cuban and South-American Hispanic (29.1%) origins, but

**Table 1. Composite profile for Hispanic-American women with type 2 diabetes mellitus**

N=126	Scale	Mean ± SD	Range
Age		50.3 ± 15.9	18 – 85
Age at diagnosis		42.6 ± 14.7	16 – 75
Years since diagnosis		7.8 ± 8.1	0 – 37
Body mass index (kg/m <sup>2</sup> )		28.9 ± 4.6	20.9 – 43.4
Percent body fat (%)		34.4 ± 6.3	21 – 48
Glycosylated hemoglobin (%)		8.5 ± 1.4	6 – 12
Self-rated health	1–5	3.3 ± 1.1	1 – 5
Understanding of diabetes mellitus	0–65	35.3 ± 11.9	12 – 62
Diabetes knowledge score	0–25	16.3 ± 4.8	0 – 24
Diabetes empowerment score (%)	0–100	71.1 ± 13.5	20 – 100
Depression score	0–63	12.8 ± 8.7	0 – 54
Perceived stress score	0–40	19.2 ± 7.5	3 – 39

also includes Mexicans (5.5%), Puerto Ricans (12.5%), and Spaniards (2.3%). A profile for the diabetic Hispanic women surveyed is provided in Table 1. Although the mean age at diagnosis was 42.6 (± 14.7) years, 38.9% of participants reported being diagnosed with type 2 diabetes before the age of 40. Diagnosis was made by the primary healthcare provider of the patient. Participants ranged from being newly diagnosed to living with diabetes for up to 37 years, with the mean period since diagnosis being just under eight years. Most participants (95.2%) were being treated with a combination of recommended oral hypoglycemic agents, diet, and exercise; none reported treatment with diet and exercise only; and six participants reported using insulin and oral hypoglycemics.

Approximately 80% of study participants were overweight and obese, and according to classifications published by the National Institutes of Health,<sup>21</sup> 43.7% were overweight (BMI 25.0–

29.9), 29.4% were class I obese (BMI 30.0–34.9), 6.3% were class II obese (BMI 35.0–39.9), and one participant (0.8%) was class III obese (BMI >40.0). The mean BMI for all participants was 28.9 (± 4.6). Percent body fat measures ranged from 21% to 48%, and the mean was 34.4%. Mean glycosylated hemoglobin (HbA1C) was 8.5%, and ranged from 6% to 12%. Only 14.3% of women surveyed had HbA1C <7%, and 52.3% had HbA1C >8%.

### Prevalence of Depression

During piloting of the data collection instruments, the investigators noted that some questions relating to support from family and friends provoked a negative emotional response. In order to minimize the effect of this acute emotional response on the depression score, the Beck Depression Inventory II

(BDI-II) was administered prior to the other data collection instruments. During screening, participants were asked if they had ever been screened or evaluated for or diagnosed with depression by any healthcare provider. Only four (3.2%) participants reported having ever had depression assessed, and for two of them, the assessment had been done prior to their diabetes diagnosis. All denied current treatment for depression.

The mean depression score was 12.8 (± 8.7) with scores ranging from 0–54 on a scale of 0–63. Some depression was detected in 40.6% of subjects, with 23.0% experiencing mild, 11.1% moderate, and 6.3% severe depression (Table 2).

Depression correlated significantly with several variables (Table 3). Significant ( $P<.05$ ) positive relationships were seen with depression scores for age and years since diagnosis. The correlation between HbA1C and depression score was significant ( $r=0.27$ ;  $P<.01$ ). Depression scores were also significantly correlated with perceived stress ( $r=0.56$ ;  $P<.01$ ). A significant negative correlation was seen between self-rated health and depression ( $r=-0.52$ ;  $P<.01$ ). Respondents were asked to rate their health on a Likert-type scale with poor=1, fair=2, good=3, very good=4, and excellent=5. Negative correlations ( $P<.05$ ) with depression were also seen with understanding of diabetes ( $r=-0.20$ ) and diabetes knowledge ( $r=-0.19$ ).

**Table 2. Ranked depression among participants (N=126)**

Estimated Level of Depression	Threshold Scores	Frequency	% of N
Minimal	0–13	75	59.6
Mild	14–19	29	23.0
Moderate	20–28	14	11.1
Severe	29–63	8	6.3

**Table 3. Factors significantly correlated with depression**

N=126	Mean ± SD	R
Current age (years)	49.98 ± 16.04	0.22*
Years since initial diagnosis	7.75 ± 14.81	0.21*
Glycosylated hemoglobin (%)	8.53 ± 1.37	0.27†
Self-rated health (%)	2.72 ± 1.03	0.51†
Understanding of diabetes (%)	35.65 ± 11.87	- 0.20*
Diabetes knowledge	16.36 ± 4.82	- 0.19*
Perceived stress	19.13 ± 7.55	0.56†
Percent body fat	34.31 ± 6.45	0.26†

\* Correlation is significant at the 0.05 level (two-tailed).

† Correlation is significant at the 0.01 level (two-tailed).

Table 4. Relationship between health and psychosocial indicators and depression level\*

N=126	Depression (Mean ± SD)			
	Minimal	Mild	Moderate	Severe
% of N	59.6	23.0	11.1	6.3
Years since diagnosis	6.41 ± 6.82 <sup>b</sup>	8.93 ± 8.49 <sup>b</sup>	8.62 ± 7.63 <sup>b</sup>	16.13 ± 12.82 <sup>a</sup>
Self-rated health	3.09 ± 1.01 <sup>a</sup>	2.52 ± 0.69 <sup>b</sup>	1.92 ± 0.86 <sup>c</sup>	1.50 ± 0.76 <sup>c</sup>
Empowerment score	72.62 ± 11.89	71.47 ± 13.68	67.67 ± 17.19	63.25 ± 20.14
Manage psychological aspects of diabetes	3.48 ± 0.89	3.45 ± 0.90	3.18 ± 1.04	3.23 ± 1.19
Readiness to change	3.74 ± 0.65 <sup>a</sup>	3.69 ± 0.73 <sup>a</sup>	3.58 ± 1.01 <sup>ab</sup>	3.08 ± 1.16 <sup>b</sup>
Set and achieve goals	3.67 ± 0.78	3.58 ± 0.95	3.40 ± 1.03	3.19 ± 0.95
Glycosylated hemoglobin	8.39 ± 1.34 <sup>a</sup>	8.54 ± 1.19 <sup>ab</sup>	9.21 ± 1.64 <sup>b</sup>	9.18 ± 1.89 <sup>ab</sup>
Understanding of diabetes	37.14 ± 11.39 <sup>b</sup>	33.34 ± 11.21 <sup>ab</sup>	37.15 ± 13.17 <sup>ab</sup>	28.13 ± 14.71 <sup>a</sup>
Diabetes knowledge	16.86 ± 4.56 <sup>b</sup>	16.69 ± 3.44 <sup>ab</sup>	15.15 ± 7.03 <sup>ab</sup>	13.25 ± 6.02 <sup>a</sup>
Perceived stress	16.61 ± 6.32 <sup>b</sup>	18.79 ± 6.42 <sup>b</sup>	26.77 ± 6.57 <sup>a</sup>	28.63 ± 5.34 <sup>a</sup>

\* Values within a row with different letter superscripts differ significantly,  $P < .05$ .

### Levels of Depression

Participants were categorized by levels of depression by BDI-II scores, and comparison by ANOVA and post hoc revealed the following findings (Table 4). Subjects categorized as severely depressed had lived with diabetes for a significantly ( $P < .05$ ) longer mean number of years than those found moderately, mildly, or minimally depressed. Means for period since diagnosis did not differ significantly ( $P < .05$ ) for minimally, mildly, and moderately depressed participants. On a scale of 1 (poor) to 5 (excellent), minimally depressed participants rated their health significantly better (3.09) than those mildly (2.52), moderately (1.92), or severely (1.50) depressed. Mildly depressed participants also had a significantly higher mean self-rated health score than those moderately and severely depressed. Both minimally and mildly depressed subjects had significantly lower mean perceived stress scores than the moderately and severely depressed groups. Although means for total empowerment score did not differ significantly among the participants grouped by the four levels of depression, the minimally and mildly depressed participants had significantly higher mean readiness to change scores (a subcategory of empowerment) than the severely depressed group. Means for the other subcategories of empowerment:

managing psychological aspects of diabetes and setting and achieving diabetes goals did not differ significantly among the participants grouped by depression levels. For the understanding of diabetes variable, mean score for the minimally depressed group ( $37.14 \pm 11.39$ ) was significantly ( $P < .05$ ) higher than that for the severely depressed group ( $28.13 \pm 14.71$ ). The severely depressed participants had the lowest mean score on diabetes knowledge ( $13.25 \pm 6.02$ ), which was significantly ( $P < .05$ ) lower than the mean for the minimally depressed group ( $16.86 \pm 4.56$ ) but did not differ significantly from the mildly or moderately depressed.

### DISCUSSION

The American Diabetes Association<sup>2</sup> and the American Association of Clinical Endocrinologists<sup>22</sup> stress the need for evaluating diabetic patients' psychosocial status and tailoring treatment goals and methods appropriately; however, our study participants revealed that this evaluation was rarely done, and only four women reported having their psychosocial status addressed. McCulloch et al<sup>23</sup> suggested that US healthcare system is set up to deliver "acute reactive care," which does not encourage healthcare providers to

take the time to develop rapport with patients that is necessary to address psychosocial issues. Additionally, due to prohibitive out-of-pocket healthcare expenses even when patients have health insurance,<sup>7,23-27</sup> many diabetes patients may see their physicians only when illness presents,<sup>28</sup> at which time the priority of the busy practitioner may be to address immediate risk.<sup>29</sup>

Depression is projected to be the second leading cause of disability by the year 2020,<sup>30</sup> and being female, having a family history of depression, being unemployed, and having a chronic disease will predict the greatest risk of being depressed. While the current estimates for incidence of depression among diabetes patients range from 15%–20%,<sup>4</sup> some depression (mild to severe) was detected in 40.5% of our study participants, which may provide a truer glimpse at the potential for depression among Hispanic women with diabetes. Previous studies have not reported on varying levels of depression among diabetics; we found that 11.1% and 6.3% of our participants had scores that placed them in the moderate and severe depression categories, respectively. Zauszniewski et al<sup>31</sup> report that among type 2 diabetes patients, depression appears to occur more frequently among young and middle-aged women, and our popula-

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tion who were largely young and middle-aged women did appear to have a high incidence. Additionally, our eligibility criteria excluded women who had not had a glycosylated hemoglobin test within the past six months. Since the lack of regular tests may be an indication that inadequate care is being provided for these women, depression may be even more prevalent among them.

Our data on depression reveal a strong positive correlation with perceived stress and negative correlations with factors that relate to mastery of self-care: understanding of diabetes<sup>32</sup> and diabetes knowledge.<sup>33</sup> When our participants were compared by severity of their depression, the severely and moderately depressed groups had significantly higher mean perceived stress scores and higher mean glycosylated hemoglobin than the mildly and minimally depressed groups. The severely depressed group also had significantly lower mean scores for understanding of diabetes and diabetes knowledge than all other groups.

Our study showed that good diabetes management as defined by glycosylated hemoglobin scores <6.5% was not widely achieved among our Hispanic study population, indicated by a mean glycosylated hemoglobin score of 8.5%, and fewer than 14% of participants had good control (HbA1C<7.0%). Even though diabetes treatment recommendations are updated and published annually by the

ADA,<sup>2</sup> and the benefits of comprehensive diabetes management are promoted, aggressive adoption of these recommendations was not evident in the diabetes care reported by our study population. The dietary and physical activity areas appeared to be those most often addressed and the psychosocial issues, which can decide patient adoption and adherence to diet, exercise, and medication regimens, were often ignored.<sup>34</sup> Earlier studies on the treatment of depression with medications such as tricyclic antidepressants and selective serotonin reuptake inhibitors reported the potential for drug interactions.<sup>8,35</sup> Some researchers suggested that while antidepressants may cause a slight increase in fasting blood glucose levels, this increase is negated by the concurrent alleviation of depression and resulting improvement in glycemic control that occur with their use.<sup>35</sup> However, Lustman et al<sup>36</sup> reported that in patients treated with nortriptyline and who experienced improvement in depression, significant increases were seen in glycosylated hemoglobin. When drug interactions are a concern, cognitive behavior therapy has been proposed as an alternative treatment for depression, but reports of its success vary.<sup>37</sup> To a large extent, and perhaps rightly so, psychosocial state appears to be considered the province of mental care professionals, but they may only see the diabetic patient upon referral from other healthcare professionals or at the patient's initiative.<sup>34,37,38</sup> Therefore this treatable comorbidity of diabetes continues to be an often ignored potential barrier to better diabetes self-management.

Psychosocial assessment can be as vital an element of diabetes treatment as physiological evaluations. Our hope is that, just as biochemical tests are considered fundamental to evaluating diabetes status and efficacy of therapies, standardized, user-friendly inventories for psychosocial evaluation that include at least a depression assessment will become part of standard care to help diabetes care providers

better target their patient care and education.

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### AUTHOR CONTRIBUTIONS

*Design and concept of study:* Shah, Huffman  
*Acquisition of data:* Shah, Huffman  
*Data analysis and interpretation:* Shah, Huffman  
*Manuscript draft:* Shah, Huffman  
*Statistical expertise:* Shah, Huffman  
*Acquisition of funding:* Huffman  
*Administrative, technical, or material assistance:* Huffman  
*Supervision:* Huffman