In Brief

Members of minority groups with diabetes display high rates of depressive affect and clinical depression. These rates vary by ethnic group, although all rates are higher than those of people without diabetes. Education, income, and family relationships may account for some of these differences.

Depressive Affect Among Four Ethnic Groups of Male Patients With Type 2 Diabetes

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Members of ethnic minority groups in the United States have a higher risk of being diagnosed with diabetes,[1,2] and those with diabetes have poorer glycemic control and more frequent complications,[3] greater functional impairment,[2] and higher rates of complications than members of majority groups with diabetes.[4–6] Other studies have shown that > 25% of members of ethnic minority groups with diabetes reach criteria for major depressive disorder (MDD),[4,5] and far more display high levels of depressive symptoms at rates above those found in members of majority groups.[6]

Thus, MDD and high levels of depressive symptoms are prominent co-morbid conditions with significant implications for clinical care. It is well documented, for example, that depressive symptoms affect disease management,[6] and new data suggest that depressive symptoms may directly reduce insulin sensitivity.[7] Depression most likely influences glycemic control through both behavioral and physiological pathways, highlighting at least two targets for intervention.

From a clinical perspective, two issues remain unexplored. First, although high rates of MDD and depressive symptoms among ethnic minorities with diabetes have been well documented, the relative rate among members of different minority groups has not been explored in the same study. Thus, the impact of ethnicity alone, unconfounded by other factors, has not been directly assessed. The risk of depression among patients with diabetes may vary considerably from group to group, thus requiring different levels of clinical attention and different forms of intervention in different ethnic settings. Second, > 30 years of research has shown that women in the general population experience and report more than twice the rate of depressive affect than men, and the female-to-male ratio for MDD has been reported to be as high as 4:1.[8] In contrast, however, we showed no significant differences in rates of likely depression and levels of depressive affect between Hispanic males and females and between European-American males and females with type 2 diabetes.[5] With the intensive focus on the high rates of depression among women and ethnic minorities, it remains unclear what the relative rates are for male patients with diabetes across ethnic groups. The answers to these questions will help clinicians direct attention to those male minority patients with diabetes at highest risk for MDD or depressive affect.

METHODS
Sample
As part of a larger study, adult male patients with type 2 diabetes who met inclusion criteria were identified from billing records and clinical databases

at 10 community health care settings. Criteria for inclusion were:

- at least 1 year since diagnosis
- age of 25–70 years
- no evidence of major diabetes complications (e.g., proliferative retinopathy, cerebrovascular accident or myocardial infarction within the past 12 months, renal insufficiency, or amputations)
- U.S. residency of at least 1 year
- Self-identified as European American (n = 69), Hispanic (from Mexico or Central America; n = 49), Chinese American (born in United States or Asia; n = 93), or African American (born in the United States; n = 63).

Procedures

Patients were screened for inclusion criteria by telephone, and a home visit was scheduled to introduce the project and review informed consent. The project included a 1.5-hour home visit, completion of questionnaires (45 minutes), and a second home or office visit to complete additional questionnaires and interviews (1 hour). Research assistants and patients shared the same ethnicity and language, written materials were translated into Chinese and Spanish, and the study received Human Subjects approval from the Institutional Review Board of the University of California San Francisco.

A variety of demographic, disease-related, and social-context measures were collected as part of the larger study, including hemoglobin A_{1c} (A1C), time since diagnosis, BMI, and income. In addition, the Center for Epidemiological Studies—Depression (CES-D) scale was used to assess depressive affect. Using this scale, 20 symptoms are rated on a four-point scale that refers to the number of days during the previous 2 weeks the symptoms occurred. A score of ≥ 16 is considered "likely" depression. Also included were patient ratings of their current spousal relationship along three dimensions: general relationship satisfaction,[9] negative conflict resolution,[10] and together (shared activities).[10] All written materials were prepared in English, Spanish, and Chinese following forward and back translation by a panel of experts and reviews by focus groups.

Findings

Although drawn from the same community health care settings, the male patients from the four ethnic groups showed consistent differences (Table 1). Of particular interest were the relatively low BMIs and A1C results among Chinese Americans compared to the other groups, despite this group's having the second-longest average time since diagnosis. This most likely reflected the variability in disease expression among different ethnic groups. As expected, European Americans had the highest income and education levels.

There were significant differences in CES-D scores among the four groups (F = 3.42, P = 0.02), with European Americans and African Americans reporting the lowest depressive affect scores and Chinese Americans and Hispanics reporting the highest depressive affect scores. Given that mean CES-D scores for nondiabetic, nonminority community samples generally range between 7.9 and 9.3,[11] our findings indicate notably elevated scores for the three ethnic minority groups in this study. However, once we controlled for patient income and education, the CES-D score differences across ethnic groups no longer reached significance (F = 1.07, P = 0.12). This suggests that social class and, by inference, access to care accounted for the differences observed in the initial analyses. Further analyses to assess the impact of other disease-related variables (A1C, time since diagnosis, and BMI) were nonsignificant.

The rate of likely clinical depression for males from all four ethnic groups combined, based on a CES-D score of ≥ 16, was 25.9%. This rate was higher than the rate of 16.0% reported for nondiabetic community samples.[11] The rates for male patients in each group in our sample were 14.5% for European Americans, 32.7% for Hispanics, 22.2% for African Americans, and 34.4% for Chinese Americans. These findings indicate that the rates of likely clinical depression were significantly higher for each of the three ethnic minority groups than for the European-American patients in our sample (χ^2 = 9.63, P = 0.02), as well as for general community samples. Again, however, these statistically significant differences disappeared when controls for income and education were included (F = 2.17, P = 0.09).

To examine differences by sex, we next compared the CES-D scores reported by male patients in the sample to those reported by female patients separately for each ethnic group. Although in general female patients displayed a trend toward reporting higher levels of depressive affect than male patients, there were no significant differences in CES-D scores between male and female patients with diabetes in any of the four ethnic groups.

We also were interested in identifying factors linked with depressive affect so that we could compare and contrast indicators of risk for depression for male patients with diabetes from different ethnic groups. We created three blocks of factors for this purpose: demographic factors (income), disease-related factors (A1C and time since diagnosis), and family social-context factors (together, positive conflict resolution, relationship satisfaction). We then included the three blocks in a single multiple regression analysis for each ethnic group with CES-D as the dependent variable.

Table 1. Sample of Male Patients With Type 2 Diabetes

	European American	Hispanic	African American	Chinese American	F
N (males)	69	49	63	90	
Age (years)	52.6 (7.0)	48.6 (8.7)	54.9 (9.4)	57.8 (7.6)	15.0*
Education (years)	15.8 (2.8)	10.6 (3.7)	14.4 (2.6)	12.3 (3.9)	28.0†
Income ($ thousands)	70.1 (31.8)	32.2 (18.4)	40.0 (30.5)	44.4 (34.8)	61.5*
Time since diagnosis (years)	4.3 (2.3)	4.2 (2.3)	7.4 (5.4)	6.7 (4.8)	10.1*
A1C (%)	8.2 (1.6)	8.9 (2.2)	8.7 (2.5)	7.4 (1.3)	9.23*
BMI (kg/m²)	32.3 (6.5)	29.8 (4.1)	31.5 (6.7)	25.1 (2.9)	32.3*
CES-D score	9.1 (4.7)	12.9 (5.1)	10.5 (5.9)	13.1 (5.8)	3.4†

* P < 0.001; † P < 0.01.

The block of social-context variables was the single best set of predictors of depressive affect for each of the four ethnic groups of male patients (European Americans: $\Delta R^2 = 0.30$, $F = 8.74$, $P = 0.001$; Hispanics: $\Delta R^2 = 0.21$, $F = 3.63$, $P = 0.02$; African Americans: $\Delta R^2 = 0.14$, $F = 3.48$, $P = 0.02$; Chinese Americans: $\Delta R^2 = 0.18$, $F = 5.99$, $P = 0.001$). Neither the demographic nor the disease-related factors were significantly related to depressive affect for male patients in any ethnic group when the social-context variables were included in the analysis. Among the social-context variables, negative conflict resolution and lack of relationship satisfaction were most frequently linked to depressive affect among male patients, with few substantive differences across groups.

IMPLICATIONS

Our findings again highlight the relatively high rates of both depressive affect and likely clinical depression found among male patients with type 2 diabetes from ethnic minority groups. One particularly striking result is the large number of male patients with elevated levels of depressive affect who may not meet criteria for a clinical diagnosis of MDD. Other research suggests that depressive affect displays a negative and linear relationship with disease management such that as these symptoms increase, there is a corresponding decrease in disease management and glycemic control.[5,6] Thus, depressive symptoms can affect the management of diabetes even though the criteria for a diagnosis of MDD are not met.

Attention to depressive affect remains important across the entire range of affective expression. Both behavioral and pharmacological interventions may be useful for patients with subclinical depressive symptoms. These findings again raise the issue of including some form of depression screening as part of regular diabetes care for all patients with diabetes.

Despite notable variations in rates of likely clinical depression and levels of depressive affect across ethnic groups, most of these differences are accounted for statistically by variations in patient income and education level. The lower the income and education level among male patients from ethnic minority communities, the higher the rate of likely clinical depression and the higher the number

of reported depressive symptoms. What we observe initially as variation among male patients with diabetes across different ethnic groups is statistically due to variation in social class both within and between ethnic minority communities.

But this may be only part of the story. Changes in economic resources and increased education over time expose members of ethnic minorities to new experiences that alter traditional health beliefs, lifestyle behaviors, and interpersonal relationships. These changes provide a variety of cultural learning experiences that enhance and broaden adaptation to the new and continually changing social environment. This process is most likely ethnic-specific, as traditional beliefs and values are integrated with those of the larger culture.

Thus, economic resources and educational background do not fully explain ethnic group differences in risk for depression or group differences in levels of clinical depression or depressive affect. They may instead be the tip of the iceberg or serve as surrogate markers for a focal process of change over time that is unique to each ethnic group and dependent on each group's system of beliefs and orientation to the world. Thus, ethnicity and culture remain core concerns in working with patients with diabetes who display high levels of depressive affect.

Most likely, there are several interrelated pathways through which these processes operate. First, and most obvious, poverty reduces access to care and the ability to pay for acute and preventive health care services, including diabetes care. Second, poverty reduces the chances of obtaining education about diabetes and its management, which, in turn, often leads to a negative disease trajectory. Third, poor people, compared to the affluent, often have fewer positive experiences dealing with the health care system, and they have fewer alternatives for caring for their disease in an ongoing program of care.[12] There is, therefore, little continuity, consistency, and coherence of care over time for many of these patients.

Fourth, negative experiences with the health care system and poor knowledge and health literacy about diabetes often generate a set of beliefs and expectations about both the disease and the role of health care providers that may constrain and limit the delivery of care.[13] For example,

poor patients often are unaware of treatment options or alternative forms of treatment. These beliefs often are based on previous, less-than-satisfactory experiences with the health care system that have left patients unmotivated to engage in ongoing care.[14] Fifth, the stresses of poverty, including managing multiple jobs, living in poor housing, dealing with family stress, and interacting with multiple public agencies, can create a somewhat complicated lifestyle not conducive to organized and systematic diabetes care. Diabetes can easily be placed on the back burner when how the rent will be paid or how the family will be fed assume prominence. These stresses often lead to lower diabetes self-efficacy, especially among male patients whose traditional cultures value male assertiveness, self- and community respect, and financial success. As diabetes progresses over time and co-morbidities increase, depressive symptoms linked to high levels of blood glucose also increase into an escalating cycle. Overriding all of these processes is the interpretive frame imposed by ethnicity and culture.

In contrast to other studies, we continue to find few differences in the levels of depressive affect between male and female patients with type 2 diabetes. We originally reported no sex differences in an initial study with European-American and Hispanic patients,[5] and now a similar finding has occurred when we add groups of Chinese-American and African-American patients to our cohort. It may be the case that diabetes, and perhaps other chronic diseases, levels the playing field regarding sex differences. The lifestyle demands required for disease management and the associated co-morbidities may exert equal levels of diabetes-related distress for both sexes that override any sex-specific factors. The observable expression of depressive affect may vary by sex, but among patients with diabetes in our sample, the reported level or experience of depressive affect is the same for male and female patients from both ethnic minority and majority groups.

Among all of the factors included in the analyses that might suggest risk for depressive affect among male patients with diabetes, family conflict resolution around diabetes and general spousal/partner relationship satisfaction are the most prominent. Interestingly, these same two factors emerged in our earlier study with only European-American

and Hispanic patients, and they were also among those linked to outcomes in a previous review of indicators of risk in other chronic diseases.[15] Characteristics of intimate family relationships are more powerful indicators of risk for depressive affect among male patients with diabetes than are demographic and disease-related factors. A similar analysis with female patients, not reported above, yielded the same results. Consequently, both male and female patients with diabetes from all four ethnic groups share the same pattern of risk factors for depressive affect.

There is little question that the family provides the broad social context of disease management for patients with diabetes.[16] The emotional climate of family relationships and the skills couples and family members utilize to negotiate with each other and resolve problems in the day-to-day management of this chronic disease create the interpersonal atmosphere within which disease management takes place over time. In some sense, family finances, life stress, and characteristics of the disease operate through family relationships, because it is in this intimate interpersonal environment that chronic disease is understood, experienced, and managed.

Our findings suggest that negative relationship characteristics among intimate family members are important indicators of risk for depressive symptoms among adult patients with diabetes. Although a focus on family relationships has been the norm when working with children or adolescents with diabetes, it has not been a central area of study and care when working clinically with adult patients with diabetes. Our findings suggest that family relationships are significantly related to the management of diabetes across the age span for both male and female patients from both ethnic minority and majority groups.

Our findings appear to emphasize the similarities, rather than the differences, among ethnic groups, between patient sexes, and between majority and minority group membership with respect to depressive affect in patients with diabetes. Although few differences among the dynamics of the relationships studied were demonstrated, interventions designed to address depressive affect among these patients need to be sex- and ethnic group–specific. That is, although the levels of and risk factors for depressive affect are similar across ethnic groups, once income and education are taken into account, the ways in which depressive symptoms express themselves in individual patients and the methods and protocols used by clinicians to address these symptoms require taking ethnic group membership and sex into account. For example, group programs may be less accepted at the outset by Chinese-American patients and spouse/partners than by patients from other ethnic groups; the use of psychotropic medications may be less welcomed by African-American patients than by others; Latinas with diabetes may be more inclined to participate in group programs than Latino patients; and the willingness to publicly reveal spousal/partner problems with diabetes may vary by ethnic group and sex.

Many of these differences result from culturally based values, norms, and expectations. Therefore, although the risk indicators are similar across the subgroups studied, translating these findings into clinical care requires awareness of the culture of ethnicity and sex, the two major cross-cutting themes underlying effective behavioral interventions in diabetes.

Acknowledgments

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