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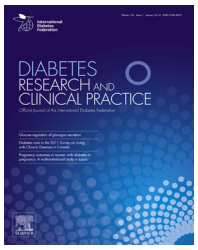

International Diabetes Federation

Race/ethnicity moderates the relationship between chronic life stress and quality of life in type 2 diabetes☆

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ABSTRACT

Aims: To determine whether chronic life stress is differentially associated with quality of life (QoL) for Blacks vs. Hispanics with type 2 diabetes.

Methods: We assessed self-reported chronic stress and QoL in 125 patients with type 2 diabetes who self-identified as either non-Hispanic Black or Hispanic. Separate cross-sectional two-way interaction models (stress × race/ethnicity) with physical and mental health as outcomes were examined.

Results: The two-way interaction predicted mental ($b = 3.12$, $P = .04$) but not physical health. Simple slopes analyses indicated that under conditions of high stress, Blacks ($b = -4.4$, $P < .001$), but not Hispanics, experienced significantly lower levels of mental health. In exploratory analyses, we examined a three-way interaction (stress × race/ethnicity × social support) with physical and mental health as outcomes. Results indicated the three-way interaction predicted mental ($b = .62$, $P = .01$) but not physical health. Simple slopes analyses indicated that under conditions of high stress, high levels of social support improved mental health for Hispanics ($b = 1.2$, $P < .001$), but not for Blacks.

Conclusions: Black patients with type 2 diabetes may be particularly vulnerable to the deleterious effects of high chronic stress. Social support buffers effects of stress on mental health in Hispanics but not Blacks, which suggests differences in the use and/or quality of social support between Hispanics and Blacks. Longitudinal investigations that examine race/ethnicity, stress, social support, and QoL should help clarify the processes that underlie these observed relations.

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1. Introduction

Nearly 26 million Americans are living with diabetes [1] with type 2 diabetes accounting for 90–95% of all diagnosed cases [2]. Patients with diabetes frequently experience impaired quality of life (QoL) due to diabetes-related distress and complications and comorbidities associated with this chronic disease. Black and Hispanic adults are two to three times more likely to have type 2 diabetes [3] and to suffer from diabetes-related distress [4], complications [2] and poor QoL [5] compared to non-Hispanic Whites. Blacks and Hispanics also encounter more severe chronic life stress (e.g., access to fewer economic resources and racial/ethnic discrimination) compared to non-Hispanic Whites [6,7], which may exacerbate the impact of diabetes on QoL. Several studies have found that exposure to chronic stress increases the risk of being diagnosed with diabetes [8–11] and contributes to poor glucose control [12]. However, the majority of studies of the effects of chronic stress in diabetes patients have been conducted in predominantly Caucasian samples, the findings from which may not generalize to other racial/ethnic groups. Additionally, most investigations that have included non-Caucasian patients have combined Blacks and Hispanics into one category and compared them to Whites, which ignores the possibility that Blacks and Hispanics with diabetes may be differentially susceptible to the effects of chronic stress. A couple of notable studies have examined the role of stress in Blacks and Hispanics separately [12,13] but are limited by a focus on one type of life stress (e.g., discrimination) and a restricted range of outcomes (e.g., diabetes-related distress). Evidence from large-scale epidemiological studies demonstrating that Blacks and Hispanics experience divergent health outcomes despite similar socioeconomic disadvantages [14], a phenomenon known as the Hispanic Paradox [15,16], underscores the importance of examining whether the effects of chronic stress vary by race/ethnicity.

To our knowledge, no studies to date have examined whether exposure to a range of chronic stress domains predicts key outcomes such as mental and physical QoL in Black and Hispanic diabetes patients and whether race/ethnicity moderates this relationship. Understanding the relationship between chronic stress and QoL in Black and Hispanic diabetes patients will help to determine the need for stress reduction interventions in these groups and identify which patients are most likely to benefit from such interventions. Additionally, evaluating effects of a broad range of chronic life stressors beyond diabetes distress may inform culturally appropriate stress-reduction interventions for Black and Hispanic patients. In the present study we tested: (a) whether chronic stress predicted QoL in Blacks and Hispanics with type 2 diabetes; and (b) whether the relationship between chronic stress and QoL was moderated by race/ethnicity.

2. Subjects, materials, and methods

2.1. Patients and procedures

Adult patients with diabetes ($n = 125$) who self-identified as non-Hispanic Black or Hispanic were enrolled from outpatient clinics at Bellevue Hospital Center in New York City. After providing written informed consent, patients completed self-report questionnaires with the help of a research assistant if needed. Patients' medical records were reviewed to confirm the diagnosis of diabetes.

2.2. Study assessments

Chronic stress was assessed using The Global Perceived Stress Scale (GPSS), developed for the Jackson Heart Study—an epidemiologic study of cardiovascular diseases in Blacks [17]. The GPSS is an eight-item questionnaire adapted from Kohn and MacDonald's Survey of Recent Life Experiences [18], Cohen et al.'s Perceived Stress Scale [19], and Sarason et al.'s Life Events Scale [20] that measures the perception of stress experienced over a prior period of twelve months in the following domains: employment, relationships, neighborhood of residence, caring for others, legal problems, medical problems, experiences of racism and discrimination, and meeting basic needs. Participants rated each domain on the GPSS on a four-point scale ranging from (1 = ''not stressful''; 4 = ''very stressful''). A cumulative stress score was calculated by recoding each item rated as moderately or very stressful to a '1 and summing across all 8-items, for a maximum cumulative stress score of 8. Internal consistency for the scale in this sample was $\alpha = .76$.

Health-related QoL was assessed with the Short Form-12 (SF-12), a validated and widely-used self-report measure [21]. The SF-12 yields eight subscales representing various domains of functioning, which are combined to create physical component summary (PCS) and mental component summary (MCS) measures. Each subscale contributes to both summary measures, but physical functioning, physical role limitation, bodily pain and general health are weighted more heavily in the PCS score, whereas mental health, emotional role limitation, social function and vitality are weighted more heavily in the MCS score. PCS and MCS scores are transformed based on U.S. normative data to a mean of 50 and standard deviation of 10, where higher scores reflect better functioning. Internal consistency for the scale in this sample was $\alpha = .91$.

Participants completed self-reported assessments of age, sex, marital status, education (years), and income. These variables were included as covariates in all analyses. Income was adjusted for differences in household size using an equivalence scale, dividing net income by the square root of household size [22].

2.3. Data analyses

We conducted hierarchical regression analyses, centering predictor variables around their grand mean to facilitate the interpretation of main effects in models containing interaction terms (e.g., [23]). The predictors were entered into the regression model in the following two steps: (1) stress, race/ethnicity, and control variables (age, sex, marital status, education, and income); and (2) the interaction of stress and race/ethnicity. Variables in the regression models were free of extreme outliers, and we confirmed that distributions were appropriate for regression analyses.

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