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Everyday Discrimination, Diabetes-Related Distress, and Depressive Symptoms Among African Americans and Latinos with Diabetes

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Abstract

It is not known how discrimination might affect diabetes-related distress (DRD), an important correlate of diabetes outcomes. We examined correlates of discrimination and the influence of discrimination on DRD and depressive symptoms (DS) for African Americans and Latinos with type 2 diabetes. We analyzed survey data (n = 157) collected at enrollment into a diabetes management intervention. Using multiple linear regression, we examined correlates of discrimination and the association between discrimination and DRD and DS. Discrimination was significantly associated with higher DRD for Latinos (b 1.58, 95 % CI 1.08, 2.31, $p < 0.05$), but

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not significant for African Americans (b 0.96, 95 % CI 0.59, 1.57). Discrimination was marginally significantly associated with more DS for Latinos (b 1.43, 95 % CI 0.97, 2.12, $p < 0.10$), but not significant for African Americans (b 1.21, 95 % CI 0.87, 1.70). These findings suggest the need to address stressors unique to racial/ethnic minorities to improve diabetes-related outcomes.

Keywords

African Americans; Latinos; Hispanics; Discrimination; Diabetes; Mental health; Diabetes-related distress; Depressive symptoms

Introduction

Background

Discrimination is associated with poor mental health for African Americans and Latinos [1–3], who experience twice the prevalence of diabetes (10–11 %) than non-Latino whites (NLWs, 5 %) [4]. Compared to NLWs with diabetes, African Americans and Latinos have worse glycemic control [5–7] and higher diabetes mortality rates [8]. A potential contributor to these inequalities is discrimination, which may inhibit diabetes self-management behaviors [9] or adversely affect health independent of health behaviors [10].

While discrimination is associated with poor mental and physical health for Latinos [1, 11, 12] and African Americans [3, 13, 14], correlates of discrimination vary by race/ ethnicity. For African Americans, correlates include younger age, female sex, not being married, and higher educational attainment [14–16]. For Latinos, younger age, male sex, not being married, having some college or less than a high school education, being born outside of the US, speaking primarily Spanish, and, for Latino immigrants, moving to the US at younger ages are correlates of discrimination [11, 17–19]. Despite some similarities, differences in the population composition and history of racial/ ethnic relations for African Americans and Latinos [20–22] may contribute to variances in correlates of discrimination. While robust evidence suggests that discrimination is associated with poor mental health [2, 3], little is known about the relationship between discrimination and mental health among racial/ethnic minorities coping with diabetes.

Conceptual Framework

The identification of discrimination-related stressors for persons with type 2 diabetes is critical for informing interventions to eliminate inequalities experienced by African Americans and Latinos. There are several mechanisms through which discrimination may be associated with poor mental health. First, institutional discrimination in housing, employment, education, and criminal justice contexts may affect mental health through structural impediments to achieving aspirations or meeting social and material needs [2, 23]. Second, the emotional and psychological strain of stressors associated with institutional discrimination and experiences of interpersonal discrimination, including processing, coping with and navigating such experiences may contribute to adverse mental health, which has been demonstrated for African Americans and Latinos [2, 3, 24]. Depression may inhibit diabetes self-management behaviors including medication adherence, diet and physical

activity [25, 26]. Diabetes-related distress (DRD), emotional distress related to managing diabetes and associated complications [27], is also associated with poor glycemic control [7, 28, 29]. Depression is correlated with increased DRD [26, 28–30], however DRD also independently influences diabetes outcomes [28, 31].

African Americans and Latinos with diabetes experience a high prevalence of discrimination, a chronic stressor [19, 32]. In one sample of older African Americans with diabetes, 95 % experienced racial/ethnic discrimination [33]. Another study found that 52 % of African Americans and 35 % of Latinos with diabetes reported discrimination, compared with 9 % of NLWs with diabetes. [34]. Further, African Americans and Latinos are more likely to report discrimination in health care settings than NLWs [34]. Discrimination may affect diabetes-related outcomes through diabetes self-management. Discrimination is associated with a reduced likelihood of obtaining blood glucose, blood pressure, and foot exams in health care settings [9]. This evidence indicates the importance of understanding the relationship between discrimination and factors associated with diabetes self-management, including DRD and depressive symptoms (DS) [7, 25].

We examined the relationship of discrimination with DRD and DS among Latinos and African Americans with type 2 diabetes. First, we identified correlates of discrimination. For African Americans, we hypothesized that younger age, higher educational attainment, female sex, and not being married would be associated with greater discrimination. We hypothesized that for Latinos, longer US residence, younger age, male sex, and not being married would be associated with greater discrimination. Second, we examined the association between discrimination and DRD, hypothesizing that greater discrimination would be associated with higher DRD. Third, we examined the association between discrimination and DS, hypothesizing that greater discrimination would be associated with more DS. Fourth, we examined whether the association between discrimination and mental health varied by race/ ethnicity. We hypothesized that associations would differ by race/ ethnicity given differences in sociodemographic factors and the greater prevalence of discrimination among African Americans in this sample.

Methods

Participants

This analysis utilized data from the REACH Detroit Partnership community health worker (CHW)-delivered, diabetes self-management intervention [35, 36]. Latino participants were recruited from a federally qualified health center (FQHC) located in a predominantly-Latino neighborhood. African American participants were recruited from the FQHC and a large Detroit health system. Eligible participants were African Americans or Latinos with physician-diagnosed type 2 diabetes, at least 18 years old who had health insurance or received medical care from the FQHC, and resided in Eastside or Southwest Detroit. The majority of residents in Eastside Detroit are African American [37, 38]. The majority of Latino residents of Detroit reside in Southwest Detroit [38, 39]. Both neighborhoods have excess diabetes rates and lower socioeconomic ranking than neighboring towns [38]. To expand recruitment of Latino participants, some participants residing outside of these

neighborhoods were included. Persons with significant diabetes-related complications were not eligible, as severe complications would preclude full intervention participation.

Data Collection

Data for this analysis were from baseline interviews conducted from 2005 to 2006, prior to intervention delivery. Trained data collectors administered the baseline survey in the preferred language of the participant (Spanish or English). The University of Michigan Institutional Review Board approved all study protocols prior to data collection.

Measures

Everyday Discrimination—The four-item discrimination scale (Cronbach's $\alpha = 0.76$) was adapted from the Detroit Area Study everyday discrimination scale assessing the occurrence and frequency of interpersonal discrimination in everyday life [32]. Participants were asked how often they experienced four discriminatory situations, including: being treated with less courtesy or respect than others, receiving poorer service than others at restaurants or stores, people acting as if the respondent is not smart, or being threatened or harassed. Responses ranged from never (1) to always (5). We used the mean of the four items to create an everyday discrimination score. Respondents were asked to indicate the main reason for their experiences. Example response options include ancestry or national origin, gender, race, skin color, English language skills, and social class.

Diabetes-Related Distress—The Problem Areas in Diabetes Distress (PAID) Scale assessed DRD [27]. The PAID is a 20-item questionnaire (Cronbach's $\alpha = 0.93$) measuring emotional distress in managing and coping with diabetes. Example items include feeling overwhelmed by diabetes and worrying about the possibility of serious complications. Responses ranged from not a problem (1) to a serious problem (5). Responses were converted to a 0–100 scale. Higher scores indicate greater DRD.

Depressive Symptoms—The nine-item Patient Health Questionnaire (PHQ-9) assessed DS (Cronbach's $\alpha = 0.83$) [40]. Example items include feeling down, depressed, or hopeless and having little interest or pleasure in doing things. Responses ranged from not at all (0) to nearly everyday [3]. The PHQ-9 score was calculated by summing the items and ranged from 0 to 27, with higher scores indicating more DS.

Participant Characteristics—Demographic information included race/ethnicity, length of US residence, sex, age, residential neighborhood (East-side, Southwest, or another neighborhood), education (high school graduate or less than high school education), employment status, and REACH Detroit study site (FQHC or large health system).

Diabetes Self-Management—Diabetes self-management, a five-item scale of behaviors including following a healthy eating plan, glucose testing, taking medications, foot checks, and shoe inspections, was a covariate in DRD models. This variable is based on a previously validated scale [41] used in previous REACH Detroit analyses [35].

Analysis

The first analysis examined correlates of everyday discrimination. Multiple linear regression was used to assess the association between discrimination and sex, age, education, employment, race/ethnicity, and residential neighborhood. Health system was included as a control variable. Racial/ethnic-stratified models were also conducted. In stratified models, health system was included only in models with African Americans since all but one Latino participant received the intervention at the FQHC. Length of US residence was added to the models restricted to Latinos since the majority of Latinos in this sample were immigrants. A binary variable was used to characterize length of US residence: residence ≥15 years or<15 years. Two Latino participants who resided in the US for their lifetime were classified as residing in the US ≥15 years due to this small sample size.

The second set of analyses used multiple linear regression to examine the association between discrimination and DRD and DS. We first tested whether race/ethnicity modified the association between discrimination and DRD and DS. While this interaction was not significant (results not shown), we hypothesized that the association between discrimination and mental health would differ by race/ ethnicity. Models were adjusted for the aforementioned covariates. In models restricted to African Americans, we conducted sensitivity tests using the likelihood ratio test to examine the influence of the health system on these associations. In models restricted to Latinos, sensitivity analyses were conducted for length of US residence. Diabetes self-management was included in DRD models since it is associated with glycemic control [7]. DRD and DS were log-transformed to reduce skew. The sample size was reduced from n = 164 to n = 157 due to missing outcome data for some participants. PASW Statistics 18 (SPSS, Chicago, IL, 2010) was used for statistical analyses.

Results

There were significant differences between Latinos and African Americans on most sociodemographic characteristics, including age and education, with Latinos being younger and having lower educational attainment than African Americans (Table 1). African Americans (mean 1.86, SE 0.07) reported higher levels of everyday discrimination compared to Latinos (mean 1.41, SE 0.08, $p < 0.01$). There were no significant differences in DS for African Americans (mean 4.64, SE 0.50) compared to Latinos (mean 5.64, SE 0.64). Latinos (mean 33.00, SE 2.76) had a significantly higher mean DRD score than African Americans (mean 19.13, SE 2.10, $p < 0.01$).

Correlates of Everyday Discrimination

Correlates of everyday discrimination are presented in Table 2. African Americans reported more frequent discrimination than Latinos (b 0.57; 95 % CI 0.22, 0.92; $p < 0.01$), controlling for sex, age, education, employment, neighborhood, and health system. Older age was associated with less frequent discrimination (b −0.01, 95 % CI −0.02, < −0.01, $p < 0.05$), adjusting for covariates.

Due to differences in sociodemographic factors for African Americans and Latinos, racial/ ethnic-stratified models were conducted to assess the association of sociodemographic

characteristics with discrimination (Table 2). For African Americans, none of the participant characteristics were significantly associated with discrimination. For Latinos, who were generally younger than African Americans in this sample, older age was marginally associated with less frequent discrimination (b −0.02; 95 % CI −0.03, <0.01; $p < 0.10$). Longer US residence was associated with more frequent discrimination (b 0.36, 95 % CI 0.01, 0.71; $p < 0.05$).

Association of Discrimination and Mental Health

We then examined the association of everyday discrimination with DRD (Table 3) and DS (Table 4). Discrimination was not significantly associated with DRD for the full sample (b 1.17; 95 % CI 0.85, 1.62; $p > 0.05$). In stratified models, discrimination was not significantly associated with DRD for African Americans (b 0.96; 95 % CI 0.59, 1.57; $p > 0.05$). A sensitivity test examining the influence of the health system on these associations for African Americans was not significant when comparing the full and reduced models (F 1.22, p 0.27). However, since the health system differed among African Americans in this sample, and health care setting may influence experiences of discrimination, this variable was kept in the final model. In contrast, more frequent discrimination was associated with higher DRD for Latinos (b 1.58; 95 % CI 1.08, 2.31; $p < 0.05$). There was not a significant difference between the full and reduced models (F 2.27, p 0.14) for the influence of length of US residence on these associations for Latinos. However, since this variable was associated with more frequent discrimination for Latinos, it was retained in the final model. An interaction of discrimination-by-length of US residence for Latinos was not significant.

More frequent discrimination was associated with more DS (b 1.32; 95 % CI 1.03, 1.70; $p < 0.05$). In stratified models, discrimination was not significantly associated with DS for African Americans (b 1.21, 95 % CI 0.87, 1.70; $p > 0.05$). A sensitivity test examining the influence of the health system in models restricted to African Americans was not significant when comparing the full and reduced models (F 0.10, p 0.76). For Latinos, more frequent discrimination was marginally associated with higher levels of DS (b 1.43, 95 % CI 0.97, 2.12; $p < 0.10$). There was no significant difference between the full and reduced models (F 0.19, p 0.67) for the influence of length of US residence on these associations for Latinos.

Discussion

New Contribution to the Literature

This study indicates that almost one-third of African Americans in this diabetes intervention experienced high levels of discrimination. A smaller, but substantial proportion of Latinos experienced discrimination. These findings are consistent with other literature [1, 3, 17, 34]. The mental health effects of discrimination for these populations differed in two important ways. While African Americans experienced more discrimination, discrimination was not significantly associated with DRD or DS. For African Americans in this sample, none of the sociodemographic factors were significant correlates of discrimination. This may be due to the relatively high prevalence of discrimination for African Americans and limited variation in sociodemographic characteristics in this sample. In addition, the everyday discrimination

scale used in this study was a limited version of the original scale. Thus, some aspects of discrimination may not have been fully captured.

Despite the lower frequency of discrimination among Latinos, exposure to discrimination was associated with greater DRD and was marginally associated with more DS. In this study, longer US residence for Latinos was associated with more frequent discrimination, as has been shown in other studies [17]. This association may be due to decreasing insularity of social networks that buffer recent Latino immigrants, increasing contact with NLWs, African Americans and others beyond the immigrant community, and longer exposure to racialization processes in the US for Hispanic immigrants with longer US residence [42–44]. Our findings of higher DRD among Latinos are consistent with other studies [7, 45, 46]. Even when experienced less frequently, discrimination may pose an additional stressor for this population, which faces a constellation of stressors and low socioeconomic position, and may compound existing health-related stressors, including DRD. The association of discrimination with higher DRD for Latinos may help to elucidate the Latino paradox. Despite their lower socioeconomic position, Latinos, particularly Latino immigrants, exhibit better-than expected health outcomes than NLWs, which is termed the Latino paradox [47]. Variations in exposure to, and differential experiences within, the US racial structure and the more favorable health of recent Latino immigrants may obscure complex associations between race/ethnicity-related stressors and health for Latinos. Latinos in this sample were predominantly immigrants and thus may have less exposure to discrimination within the US racial system [42].

The lower frequency of discrimination among Latinos may be attributed to residential contexts. Most Latinos in this sample resided in an ethnic enclave [38, 39], where they were more likely to frequent Latino-owned businesses and seek care at the FQHC within their community. While Latinos are racially segregated within Southwest Detroit, African Americans are more likely to interact with other racial/ethnic groups [37, 38]. Given the few African American-owned businesses in Eastside Detroit, African American residents interact with business owners of other racial/ethnic backgrounds. In addition, African Americans in this sample were more likely to use health care services outside of the FQHC and have reported discrimination in health care settings [48].

While discrimination was associated with poor mental health for the entire sample, in racial/ethnic-stratified models the association between discrimination and poor mental health was not significant for African Americans, which has been previously found [14]. It is possible that discrimination is significantly associated with poor mental health for African Americans, but the low prevalence and limited variation in DS among African Americans in this sample limited the detection of significant associations. In addition, the shorter discrimination scale used in this study may not have captured all aspects of everyday discrimination and may suppress any associations between discrimination and mental health for African Americans in this sample. Indeed, in other studies discrimination was associated with poor mental health for African Americans [2, 3].

Limitations

There are several limitations of this analysis. First, causal associations between discrimination and DRD and DS cannot be assessed by this cross-sectional analysis. Second, the small sample size may limit detection of significant associations, especially for DS as evidenced by the significant associations for the total sample, but not in racial/ ethnic-stratified models. Third, this study does not examine the association between discrimination, mental health, and diabetes self-management. While we found that discrimination is associated with worse mental health, and evidence suggests that poor mental health is associated with adverse diabetes-related outcomes [7, 25, 28, 29, 49], this analysis did not examine the association of discrimination and diabetes self-management or the mediating role of mental health on the association between discrimination and diabetes self-management. Future research, conducted with larger samples, could examine the complex mechanisms, such as interactions with health care providers and community and neighborhood characteristics, by which discrimination may influence the mental health for persons with diabetes.

Conclusions

These findings suggest that African Americans and Latinos are balancing a constellation of stressors related to their racialized experiences and their physical and mental health. A central conclusion from this analysis is that mediating race/ethnicity-related stressors including discrimination could be an important part of addressing DRD for Latinos and reducing DS among racial/ethnic minorities with diabetes. These findings are particularly important given the association in other studies between DRD and DS with glycemic control [7, 26, 28, 29, 31].

These findings suggest that discrimination is an important stressor operating in the lives of African Americans and Latinos with diabetes [9, 25]. If we are to successfully eliminate diabetes inequalities, the effect of discrimination on diabetes-related outcomes must be considered when developing interventions. Potential strategies include implementing cultural competency training for health professionals and hiring professionals that reflect the patient population. Further, the racialized experience of African Americans and Latinos with diabetes suggests the need for interventions involving trained community residents who share and understand the language, ethnic background, and life experiences of participants [35, 36, 48, 50]. Strategies addressing the social context for racial/ethnic minorities with diabetes are also needed, such as policies to support the development of minority-owned businesses and to prevent institutional and interpersonal discrimination [51, 52]. Future studies evaluating multilevel interventions that address the racialized experience of African Americans and Latinos may elucidate promising strategies to improve the health of racial/ ethnic minorities differentially burdened with diabetes.

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Table 1

Participant sociodemographic and health characteristics (n = 164), 2005–2006

	Full sample (n = 164)	African American (n = 94)	Latino (n = 70)	*p* value[a]
Demographics				
Female, n (%)	116 (70.7)	70 (74.5)	46 (65.7)	0.22
Age in years (range 18–81), mean (SE)[b]	52.6 (1.0)	56.4 (1.3)	47.5 (1.3)	**<0.01**
High school graduate, n (%)	97 (59.1)	81 (86.2)	16 (22.9)	**<0.01**
Unemployed, n (%)	86 (53.4)	49 (53.8)	37 (52.9)	0.90
Length of residence in US, n (%)				
< 5 years			11 (15.7)	
5–9 years			23 (32.9)	
10–14 years			14 (20.0)	
15 or more years			22 (31.4)	
Setting				
Neighborhood, n (%)				**<0.01**
Eastside Detroit	49 (29.9)	49 (52.1)	0 (0)	
Southwest Detroit	110 (67.1)	44 (46.8)	66 (94.3)	
Outside of Detroit	5 (3.0)	1 (1.1)	4 (5.7)	
REACH study site, n (%)				**<0.01**
Federally qualified health center	95 (57.9)	26 (27.7)	69 (98.6)	
Large health system	69 (42.1)	68 (72.3)	1 (1.4)	
Frequency of discrimination				
Everyday discrimination, mean (SE)[c]	1.67 (0.05)	1.86 (0.07)	1.41 (0.08)	**<0.01**
Treated with less courtesy or respect than others, n (%)				
Never	83 (50.6)	33 (35.1)	50 (71.4)	**<0.01**
Hardly ever	39 (23.8)	31 (33.0)	8 (11.4)	
Sometimes, often or always	42 (25.6)	30 (31.9)	12 (17.1)	
Received poorer service than others at restaurants or stores, n (%)				
Never	85 (52.1)	29 (30.9)	56 (81.2)	**<0.01**
Hardly ever	46 (28.2)	43 (45.7)	3 (4.3)	
Sometimes, often or always	32 (19.6)	22 (23.4)	10 (14.5)	
People acting as if respondent is not smart, n (%)				
Never	84 (52.2)	36 (38.3)	48 (71.6)	**<0.01**
Hardly ever	32 (19.9)	29 (30.9)	3 (4.5)	
Sometimes, often or always	45 (28.0)	29 (30.9)	16 (23.9)	
How often respondent is threatened or harassed, n (%)				
Never	122 (75.3)	64 (68.1)	58 (85.3)	**0.003**
Hardly ever	26 (16.0)	23 (24.5)	3 (4.4)	
Sometimes, often or always	14 (8.5)	7 (7.4)	7 (10.3)	
Diabetes self-management, mean (SE)[d]	1.98 (0.06)	2.13 (0.07)	1.78 (0.10)	**<0.01**
Mental health (baseline)				

	Full sample (n = 164)	African American (n = 94)	Latino (n = 70)	*p* value[a]
Depressive symptoms (DS), mean (SE)[e,g]	5.07 (0.40)	4.64 (0.50)	5.64 (0.64)	0.23
Diabetes-related distress (DRD), mean (SE)[f,g]	25.00 (1.76)	19.13 (2.10)	33.00 (2.76)	**<0.01**

Bold values are statistically significant at the alpha = 0.05 level

[a] *p* values (two-tailed) were obtained using the Student's *t* test for continuous variables, Pearson's Chi-square test for categorical variables for tests of significance between African Americans and Latinos; Fisher's exact tests for categorical variables when there were expected counts of <5 in a cell

[b] *SE* standard error

[c] Everyday discrimination scale is mean of 4 discrimination items; item responses ranged from 1 (never) to 5 (always)

[d] Diabetes self-management behaviors ranged from 0 (lowest) to 3 (highest)

[e] Depressive symptoms ranged from 0 (lowest) to 27 (highest)

[f] Diabetes-related distress ranged from 0 (lowest) to 100 (highest)

[g] *p* values based on log-transformed data

Table 2

Associations with everyday discrimination: multiple linear regression results

Variable	All participants (n = 157) b[a] (95 % CI)[b] Model 1	All participants (n = 157) b[a] (95 % CI)[b] Model 2	African Americans (n = 90) b (95 % CI) Model 3	Latinos (n = 67) b (95 % CI) Model 4
Male[c]	0.04 (−0.19, 0.27)	0.08 (−0.15, 0.30)	0.06 (−0.26, 0.38)	0.05 (−0.29, 0.38)
Age (years, continuous)	< −0.01 (−0.01, 0.03)	**−0.01 (−0.02, <−0.01)** *	−0.01 (−0.02, 0.02)	−0.02 (−0.03, <0.01)¶
High school graduate[c]	**0.38 (0.17, 0.59)** **	0.06 (−0.21, 0.33)	0.24 (−0.16, 0.63)	−0.05 (−0.43, 0.34)
Employed[c]	< −0.01 (−0.23, 0.22)	−0.03 (−0.24, 0.19)	0.02 (−0.28, 0.31)	−0.08 (−0.41, 0.25)
African American[c]		**0.57 (0.22, 0.92)** **		
Neighborhood[c]		−0.07 (−0.31, 0.17)	−0.02 (−0.28, 0.24)	−0.24 (−0.91, 0.43)
Large health system[c]		−0.01 (−0.31, 0.28)	−0.14 (−0.46, 0.17)	
≥15 years of US residence[c]				**0.36 (0.01, 0.71)** *
R^2	0.08	0.15	0.08	0.10

Bold values are statistically significant at the alpha = 0.05 level

[a] Unstandardized beta-coefficients

[b] *95 % CI* 95 % confidence interval

[c] Reference groups: Male gender referenced to female gender. High school graduate referenced to less than high school education. Employed referenced to unemployed. African Americans referenced to Latinos. Neighborhood of residence: Residence in Eastside Detroit or residence in a neighborhood outside of Eastside or Southwest Detroit referenced to residence in Southwest Detroit. Large health system referenced to federally qualified health center (FQHC) as REACH study site. Residence in the USA for 15 or more years referenced to <15 years of residence in the USA for Latino sample

¶ $p < 0.10$;

* $p < 0.05$;

** $p < 0.01$

Table 3

Association between everyday discrimination and diabetes-related distress: multiple linear regression results

Variable	All Participants (n = 156) b[a] (95 % CI)[b,d] Model 1	African Americans (n = 90) b (95 % CI) Model 2	Latinos (n = 66) b (95 % CI) Model 3
Discrimination	1.17 (0.85, 1.62)	0.96 (0.59, 1.57)	**1.58 (1.08, 2.31)** *
Male[c]	0.82 (0.52, 1.28)	0.98 (0.47, 2.04)	0.62 (0.39, 1.00) ¶
Age (years, continuous)	0.98 (0.96, 1.00)	**0.97 (0.94, 1.00)** *	1.01 (0.99, 1.04)
High school graduate[c]	1.18 (0.68, 2.04)	1.12 (0.45, 2.78)	1.36 (0.78, 2.38)
Employed[c]	0.85 (0.55, 1.33)	0.69 (0.35, 1.38)	0.91 (0.56, 1.46)
African American[c]	0.58 (0.28, 1.20)		
Neighborhood[c]	0.74 (0.46, 1.21)	0.86 (0.46, 1.59)	0.48 (0.19, 1.26)
Large health system[c]	0.69 (0.38, 1.25)	0.66 (0.32, 1.37)	
Diabetes self-management	0.77 (0.58, 1.02) ¶	0.68 (0.42, 1.10)	0.97 (0.73, 1.29)
≥ 15 years of U.S. residence[c]			1.21 (0.72, 2.04)
R^2	0.23	0.18	0.20

Bold values are statistically significant at the alpha = 0.05 level

[a] Unstandardized exponentiated beta-coefficients

[b] *95 % CI* exponentiated 95 % confidence interval

[c] Reference groups: Male gender referenced to female gender. High school graduate referenced to less than high school education. Employed referenced to unemployed. African Americans referenced to Latinos. Neighborhood of residence: residence in Eastside Detroit or residence in a neighborhood outside of Eastside or Southwest Detroit referenced to residence in Southwest Detroit. Large health system referenced to federally qualified health center (FQHC) as REACH study site. Residence in the USA for 15 or more years referenced to <15 years of residence in the USA for Latino sample

[d] *p* values based on log-transform of PAID

¶ $p < 0.10$;

* $p < 0.05$

Table 4

Association between everyday discrimination and depressive symptoms (PHQ): multiple linear regression results

	All Participants (n = 157) b[a] (95 % CI)[b] Model 1	**African Americans (n = 90) b (95 % CI) Model 2**	**Latinos (n = 67) b (95 % CI) Model 3**
Discrimination	**1.32 (1.03, 1.70)** *	1.21 (0.87, 1.70)	1.43 (0.97, 2.12) ¶
Male[c]	**0.59 (0.42, 0.83)** **	0.62 (0.37, 1.01) ¶	**0.55 (0.33, 0.92)** *
Age (years, continuous)	**0.99 (0.97, 1.00)** ¶	**0.98 (0.96, 1.00)** *	1.00 (0.98, 1.03)
High school graduate[c]	0.72 (0.47, 1.10)	0.74 (0.40, 1.39)	0.68 (0.38, 1.23)
Employed[c]	0.82 (0.58, 1.14)	0.71 (0.44, 1.14)	0.99 (0.59, 1.65)
African American[c]	1.02 (0.58, 1.79)		
Neighborhood[c]	0.80 (0.55, 1.16)	0.74 (0.49, 1.11)	1.63 (0.58, 4.61)
Large health system[c]	1.05 (0.66, 1.67)	2.16 (1.32, 3.54)	
≥15 years of US residence[c]			1.31 (0.75, 2.29)
R^2	0.15	0.17	0.18

Bold values are statistically significant at the alpha = 0.05 level

[a] Unstandardized exponentiated beta-coefficients

[b] *95 % CI* exponentiated 95 % confidence interval

[c] Reference groups: Male gender referenced to female gender. High school graduate referenced to less than high school education. Employed referenced to unemployed. African Americans referenced to Latinos. Neighborhood of residence: residence in Eastside Detroit or residence in a neighborhood outside of Eastside or Southwest Detroit referenced to residence in Southwest Detroit. Large health system referenced to federally qualified health center (FQHC) as REACH study site. Residence in the USA for 15 or more years referenced to <15 years of residence in the USA for Latino sample

[d] *p* values based on log-transform of PHQ

¶ $p < 0.10$;

* $p < 0.05$;

** $p < 0.01$