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The Relation Between Diabetes Self-Efficacy and Psychological Distress Among Older Adults: Do Racial and Ethnic Differences Exist?

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Abstract

Objective—This study examined racial/ethnic differences in the relationship between diabetes self-efficacy and psychological distress among older adults with diabetes mellitus.

Method—Adults aged 60 or older with a diagnosis of diabetes mellitus ($N = 3,067$) were drawn from the 2009 California Health Interview Survey (CHIS). Hierarchical multiple regression analyses were conducted.

Results—After controlling for covariates, African Americans and those with higher levels of diabetes self-efficacy tended to have lower levels of psychological distress. Significant interactions were found in the Hispanic/Latino and Asian groups: The effect of diabetes self-efficacy on psychological distress was greater for Hispanics/Latinos and Asians than non-Hispanic Whites.

Discussion—Findings suggest that diabetes self-efficacy is associated with psychological distress among older diabetic patients and that race/ethnicity moderates the relationship between diabetes self-efficacy and psychological distress. Increasing diabetes self-efficacy will help racial/ethnic minority older patients with diabetes to improve psychological well-being at a greater level.

Keywords

diabetes; race/ethnicity; self-efficacy; psychological distress; health disparities

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Authors' Note

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Declaration of Conflicting Interests

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Introduction

Diabetes mellitus (hereafter referred to as diabetes) is one of the most prevalent chronic diseases among older adults (Kirkman et al., 2012). Approximately one quarter (i.e., 10.9 million or 26.9%) of older Americans aged 65 or older had a diagnosis of diabetes in 2010 (Centers for Disease Control and Prevention, 2011; Kirkman et al., 2012). Racial and ethnic minorities are affected by diabetes disproportionately; higher prevalence and incidence rates of diabetes have been consistently found among racial and ethnic minorities (i.e., African Americans, Hispanics, Asians, and American Indians/Alaska Natives [AI/ANs]) compared with non-Hispanic Whites (e.g., Centers for Disease Control and Prevention, 2011; Kim, Bryant, Goins, Worley, & Chiriboga, 2012; Traylor et al., 2010). Recent studies have also found racial and ethnic disparities in diabetes care outcomes (e.g., Heisler et al., 2007; Kim, Ford, Chiriboga, & Sorkin, 2012; Richard, Alexandre, Younis, Lara, & Akamigbo, 2012). For example, in a recent study of racially/ethnically diverse older adults with diabetes, disparities existed in healthcare use and access for African Americans, diabetes care management (blood glucose testing and foot examination) for Asians, and taking medicine to prevent other disease comorbidities for Hispanics and AI/ANs, all when compared with non-Hispanic White populations (Kim, Ford et al., 2012). As was addressed in the Healthy People 2010 initiative (Mukhtar, Jack, Martin, Murphy, & Rivera, 2010) and the most recent National Healthcare Disparities Report (Agency for Healthcare Research and Quality, 2011), reducing racial and ethnic disparities in diabetes care outcomes is a high priority in the field of geriatrics.

One crucial factor that may influence the care and management of diabetes regardless of patients' racial and ethnic backgrounds is self-efficacy, which is defined as beliefs about personal ability to perform behaviors that bring desired outcomes and is generally thought of as a person's confidence to regarding the behavior (Bandura, 1977; Krichbaum, Aarestad, & Buethe, 2003). Self-efficacy is an essential concept of the Social Cognitive Theory, the theoretical framework providing the idea that behaviors are influenced by a transaction between behaviors, cognitive thoughts, and environmental stimuli (Bandura, 1977). This theoretical framework further suggests the idea that patients' competence to control and manage diabetes (i.e., diabetes self-efficacy) influences which behaviors they will engage in (Krichbaum et al., 2003) and has been applied to diabetes self-management research (e.g., Gleeson-Kreig, 2006; King et al., 2010; Sarkar, Fisher, & Schillinger, 2006). Previous research on diabetes self-efficacy—similar to the definition of self-efficacy, often defined as beliefs about personal ability to adhere diabetic self-care behaviors (Trief, Teresi, Eimicke, Shea, & Weinstock, 2009)—found evidence that diabetes self-efficacy affects diabetes self-management behaviors such as diet, exercise, self-monitoring of blood glucose, and foot care (e.g., Gleeson-Kreig, 2006; King et al., 2010; Sarkar et al., 2006; Trief et al., 2009). These long-term self-management behaviors for diabetes influenced by diabetes self-efficacy may in turn affect the health status of patients with diabetes.

Literature provides evidence of a significant relationship between self-efficacy and mental health among patients with chronic medical conditions including diabetes. Previous studies reported that low self-efficacy is associated with poor mental health outcomes among patients with chronic medical conditions including diabetes (Barlow, Wright, Turner, &

Bancroft, 2005; Sacco et al., 2005; Wright, Barlow, Turner, & Bancroft, 2003; Wu, Tang, & Kwok, 2004). For example, in a study of older Chinese women with chronic diseases including diabetes, Wu and colleagues (2004) reported that those with low general self-efficacy were more likely to experience psychological distress than those with high general self-efficacy, which implies the significant role of self-efficacy.

Special lacking in the current literature is the role of race/ethnicity in the self-efficacy–mental health connection, especially among older adults. Racial and ethnic differences in the levels of diabetes self-efficacy have been noted in previous research (Lanting et al., 2008; Sarkar et al., 2006). For example, Sarkar and colleagues (2006) found evidence that African American adults had higher levels of diabetes self-efficacy and Hispanic adults had lower levels of diabetes self-efficacy than other racial and ethnic groups. In a study comparing Turkish or Moroccan diabetic patients with Dutch counterparts, Lanting and colleagues (2008) found ethnic differences in the level of self-efficacy, as well as differential effects of self-efficacy on testing glycosylated hemoglobin (HbA1c) between the two ethnic groups. With regard to racial and ethnic differences in the relation between general or disease-specific self-efficacy and mental health, however, limited information is available, especially among older adults.

To fill in gaps in the literature, this study examined racial and ethnic differences in the relationship between diabetes self-efficacy and psychological distress among elders with diabetes. Following from definitions used in previous studies, our main concepts of the present study are defined as follows: “diabetes self-efficacy” as beliefs about personal ability to adhere diabetic self-care behaviors (Trief et al., 2009) and “psychological distress” as the unique discomforting, emotional state experienced by an individual in response to a specific stressor or demand that results in harm, either temporary or permanent, to the person (Ridner, 2004). Given the results from previous research, we hypothesized that high diabetes self-efficacy would be related to low psychological distress and that the relationship between diabetes self-efficacy and psychological distress would be moderated by race/ethnicity. Findings from this research can be applied to future intervention strategies for racial and ethnic minority older adults with diabetes and other chronic diseases.

Method

Sample

Data were drawn from the 2009 California Health Interview Survey (CHIS) that was conducted between September 2009 and April 2010. The CHIS is a statewide telephone survey of California’s non-institutionalized population that has been conducted every other year since 2001. Employing a multistage sample design, the 2009 CHIS includes samples collected from three different methods (landline random-digit-dial [RDD], surname list, and cell RDD). More detailed information about the survey is available elsewhere on the CHIS webpage (<http://www.chis.ucla.edu/design.html>). The use of the publicly available CHIS has been pre-approved by The University of Alabama Institutional Review Board (IRB).

Because older patients with diabetes were the focus of the present study, adults aged 60 years and older with a self-reported diagnosis of diabetes were selected for analyses.

Respondents were asked to report whether a doctor had ever told them that they had diabetes. Those who had an affirmative answer to this question were then asked whether it was type 1, type 2, or another type. The present analyses included a total of 3,067 older adults with diabetes from five racial and ethnic groups: 2,153 non-Hispanic Whites (70.2%), 213 African Americans (6.9%), 336 Hispanics/Latinos (11.0%), 306 Asians (10.0%), and 59 AI/ANs (1.9%).

Measures

Diabetes self-efficacy—Diabetes self-efficacy was assessed with a single-item question. Respondents were asked to report “How confident are you that you can control and manage your diabetes?” Responses were categorized into four different options (*very confident* = 4, *somewhat confident* = 3, *not too confident* = 2, or *not at all confident* = 1). Higher scores indicated high confidence to control and manage diabetes.

Psychological distress—The Kessler-6 (K6) scale (Kessler et al., 2002) was used to assess psychological distress. Six items included in the K6 ask respondents to report how often they felt nervous, hopeless, restless, depressed, worthless, or that everything was an effort. The respondents reported their feelings of distress during the past 30 days on a 5-point Likert-type response format (0 [none of the time] to 4 [all of the time]). A total score of the K6 ranged from 0 to 24, with higher scores indicating greater psychological distress. Internal consistency of the K6 was satisfactory: $\alpha = .81$ for the overall sample; $\alpha = .78$ for non-Hispanic Whites; $\alpha = .83$ for Blacks; $\alpha = .85$ for Hispanics/Latinos; $\alpha = .85$ for Asians; and $\alpha = .85$ for AI/ANs.

Covariates—Patients’ background characteristics were included in analyses as covariates. These variables include age, sex, marital status, educational attainment (less than high school, high school diploma, and some college or more), household income (<US\$20K, US \$20K to US\$34K, US\$35K to US\$74K, and US\$75K), disability, comorbidity of chronic diseases, and self-rated health.

Data Analysis

Descriptive analyses were conducted to report characteristics of the sample and major study variables. After determining the absence of multicollinearity among variables, hierarchical regression analyses were conducted to test the predictability of diabetes self-efficacy on psychological distress, as well as the moderating effect of race/ethnicity on the relationship between diabetes self-efficacy and psychological distress, after adjusting for covariates. We used hierarchical regression because we were particularly interested in investigating whether diabetes self-efficacy and interactions predict psychological distress above and beyond the effect of the covariates. To interpret significant interactions, separate regression analyses of diabetes self-efficacy on psychological distress were conducted. All analyses were conducted using SPSS version 11.

Results

Background Characteristics of the Sample and Study Variables

As described in Table 1, all background characteristics and main study variables were significantly different across racial/ethnic groups. The most prevalent type of diabetes was type 2 in all five racial/ethnic groups. The mean age of older adults with diabetes was 71.95 ($SD = 7.63$), which was significantly different by race/ethnicity: non-Hispanic Whites were the oldest (72.95 years) and Hispanics/Latinos were the youngest (69.26 years). African Americans were the most likely to be female and least likely to be married, whereas Asians were of the opposite patterns. Hispanics/Latinos had significantly lower levels of educational attainment and household income compared with other racial/ethnic groups. About two thirds of elders with diabetes had disability, with AI/ANs having the highest disability rate and Asians having the lowest. Elders with diabetes had an average comorbidity of 1.19 ($SD = 0.78$): African Americans had the highest comorbidity, and Asians had the lowest. Elders with diabetes rated their overall health between good and fair regardless of race/ethnicity: Asians rated their overall health the poorest and non-Hispanic Whites rated the best.

With regard to the descriptive characteristics of our main study variables (diabetes self-efficacy and psychological distress), elders with diabetes had an average diabetes self-efficacy of 3.57 ($SD = 0.63$), indicating that on average they were somewhat or very confident to control and manage their diabetes. The mean psychological distress assessed with the K6 was 2.81 ($SD = 3.72$), with a total range of 0 to 24. The two main study variables were significantly different across the five racial and ethnic groups ($ps < .001$). Mean scores of diabetes self-efficacy were the highest among AI/ANs and the lowest among Asians. With regard to psychological distress, AI/ANs showed the highest level of psychological distress, and African Americans exhibited the lowest.

Hierarchical Regression Analysis of Psychological Distress

As summarized in Table 2, covariates were entered at the first step of the regression analysis. Diabetic elders who were younger, not married, and had lower household income, more chronic diseases, disability, and poorer self-rated health were more likely to experience psychological distress. At the second step, after controlling for all covariates, African Americans ($B = -0.92, p < .001$) and those with high levels of diabetes self-efficacy ($B = -1.04, p < .001$) were significantly less likely than African Americans and those with low levels of diabetes self-efficacy to experience psychological distress. At the third step, interaction variables were entered. After controlling for covariates and main effects, there were significant interaction effects between race/ethnicity and diabetes self-efficacy, specifically Hispanic/Latino \times Diabetes self-efficacy ($B = -0.87, p < .01$) and Asian \times Diabetes self-efficacy ($B = -0.74, p < .05$).

To interpret the significant interactions between race/ethnicity and diabetes self-efficacy identified in the Hispanic/Latino and Asian groups compared with non-Hispanic Whites, separate regression analyses were conducted, and regression coefficients were compared for three racial and ethnic groups (non-Hispanic Whites, Hispanics/Latinos, and Asians).

Results show that the effect of diabetes self-efficacy on psychological distress was greater among Hispanics/Latinos ($b = -2.249, p < .001$) and Asians ($b = -1.995, p < .001$) than non-Hispanic Whites ($b = -1.332, p < .001$).

Discussion

Despite the well-known role of self-efficacy in managing chronic diseases including diabetes (e.g., Gleeson-Kreig, 2006; King et al., 2010; Krichbaum et al., 2003; Sarkar et al., 2006), our knowledge on racial and ethnic differences in the effect of diabetes self-efficacy is limited. Thus, the present study examined how race/ethnicity moderates the relation between diabetes self-efficacy and psychological distress among elderly patients with diabetes. We found clear evidence that the low level of diabetes self-efficacy was associated with the experience of psychological distress regardless of race/ethnicity and that patients' racial and ethnic backgrounds moderated the relation between diabetes self-care and psychological distress among older patients with diabetes. Diabetes self-efficacy had a significantly greater association with psychological distress for Hispanics/Latinos and Asians compared with non-Hispanic Whites.

Consistent with previous research (Sacco et al., 2005; Wu et al., 2004), diabetes self-efficacy has a significant relation with diabetic patients' mental health among older adults regardless of their racial and ethnic backgrounds. This, in other words, suggests that diabetic elderly patients' mental health and overall well-being can be improved by increasing the level of diabetes self-efficacy. Given the previously reported significant effect of self-efficacy on the self-management and care of diabetes (Gleeson-Kreig, 2006; King et al., 2010; Sarkar et al., 2006), increasing the level of diabetes self-efficacy would be helpful for older patients with diabetes not only to manage diabetes better but also to improve their overall well-being and quality of life. Thus, researchers, healthcare professionals, and clinicians should pay more attention to developing intervention strategies focusing on increasing diabetic elders' self-efficacy.

The most intriguing finding was differential racial and ethnic effects of diabetes self-efficacy on psychological distress. Evidence in the present study suggests that Hispanic/Latino and Asian elders were more susceptible to the effect of diabetes self-efficacy on mental health than non-Hispanic White elders, even with their reported lower levels of diabetes self-efficacy. Given that previous research shows that minority elders with diabetes have poor quality of care outcomes compared with non-Hispanic White counterparts (Kim et al., 2012), special efforts to increase diabetes self-efficacy among minority elderly patients with diabetes are strongly needed to improve the quality of diabetes care outcomes among minority elders. This may eventually contribute to the reduction of existing racial and ethnic disparities in diabetes care. Further research is needed to identify other potential factors that can be used to develop future intervention strategies for minority patients with diabetes.

Racial/ethnic-specific results should be highlighted. We found evidence that significant racial and ethnic differences existed in the level of diabetes self-efficacy, with Asians, African Americans, and Hispanics/Latinos having lower levels of diabetes self-efficacy compared with non-Hispanic Whites and AI/ANs. Our finding on AI/ANs' highest level of

diabetes self-efficacy is of particular interest. The observed high levels of diabetes self-efficacy among AI/AN elders may be related to special services provided by the Indian Health Service (IHS) for highly prevalent chronic diseases among AI/ANs such as diabetes (U.S. Department of Health and Human Services, 2011). Thus, AI/ANs may have better access to educational services for diabetes through the IHS that may not be accessible to other racial and ethnic minority groups. Given that other racial and ethnic minority groups (Asians, African Americans, and Hispanics/Latinos) consistently reported lower levels of diabetes self-efficacy in the present analyses, future educational programs should target these racial and ethnic minority patients to provide a knowledge-based diabetes management program that can increase their self-efficacy to be more confident with managing diabetes.

Reasons for racial and ethnic differences in the role of diabetes self-efficacy deserve discussion. One possible explanation of the reported vulnerability of minority elderly patients with diabetes may be related to their lower levels of health literacy as evidenced in previous research (e.g., Kutner, Greenberg, Jin, & Paulsen, 2006; Osborn et al., 2011). Although the present study was not able to conduct a link to health literacy due to the lack of relevant variables in the CHIS, previous studies reported low health literacy among racial and ethnic minority patients compared with non-Hispanic Whites (Kutner et al., 2006), and a significant role of health literacy in reducing racial disparities in diabetes medication adherence (Osborn et al., 2011). Different illness perceptions among racial and ethnic minorities may have also influenced diabetic patients' adherence to treatment that is closely linked to self-efficacy (Bean, Cundy, & Petrie, 2007). Our finding on non-significant interaction with diabetes self-efficacy among African Americans could be understood in a cultural context that is unique among older African Americans. A recent study on chronic pain among older African American women found evidence that their beliefs of controlling over their own health negatively affected their perception of pain, suggesting a unique role of locus of control that plays in emotional well-being and mental health among older African American women (Baker, Buchanan, & Corson, 2008). In addition, limited access to information for diabetes may be related to minority elderly patients' vulnerability. If healthcare providers serving minority patients do not provide specific information on diabetes self-management, minority patients may not be able to find that information out by themselves. Further investigation is needed to elucidate potential reasons for vulnerability of racial and ethnic minority patients to the levels of diabetes self-efficacy.

The present study is not without limitations. First, given that the samples were drawn from a statewide data set, generalization of the results may be limited. Second, diabetes self-efficacy was measured with a single-item question in the CHIS. Given that the concept of self-efficacy is inherently more complicated than a single-item question (Bandura, 1977; Rapley, Passmore, & Phillips, 2003), future research should consider using a diabetes self-efficacy scale including multiple items. Third, given the cross-sectional nature of the study, it is not clear whether or not the directionality of the self-efficacy—psychological distress relation—was causal. Future longitudinal research should be conducted in that regard. Fourth, cultural equivalence of self-reported items has not been tested. Given that previous research suggests cultural differences in symptom reporting among older adults (Kim, Chiriboga, & Jang, 2009), there may be differences in answering self-reported questions on diabetes self-efficacy or psychological distress across different racial/ethnic groups. Finally,

ethnic subgroup differences were not examined in this study. For example, previous research focusing on Asian American elders found significant ethnic subgroup differences in health outcomes (Kim et al., 2010).

In conclusion, there were racial and ethnic variations in the role of diabetes self-efficacy in psychological distress among older patients with diabetes. Current findings suggest that improving diabetes self-efficacy would help older racial/ethnic minority patients with diabetes to increase psychological well-being to a greater degree, which may eventually help reduce racial and ethnic disparities in diabetes management and quality of diabetes care outcomes among older adults. Researchers should consider developing racial/ethnic-specific intervention strategies to enhance diabetes self-efficacy, as well as new, innovative ways to improve minority diabetic patients' psychological well-being. Finally, clinicians and healthcare professionals serving minority elderly patients with diabetes should also focus on educating their patients to be more confident in terms of managing diabetes.

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References

- Agency for Healthcare Research and Quality. National healthcare disparities report, United States, 2010. Author; Rockville, MD: 2011. DHHS Pub. No. [PHS] 11-0005
- Baker TA, Buchanan NT, Corson N. Factors influencing chronic pain intensity in older Black women: Examining depression, locus of control, and physical health. *Journal of Women's Health*. 2008; 17:869–878.
- Bandura A. Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*. 1977; 84:191–215. [PubMed: 847061]
- Barlow JH, Wright CC, Turner AP, Bancroft GV. A 12-month follow-up study of self-management training for people with chronic disease: Are changes maintained over time? *British Journal of Health Psychology*. 2005; 10:589–599. [PubMed: 16238867]
- Bean D, Cundy T, Petrie KJ. Ethnic differences in illness perceptions, self-efficacy and diabetes self-care. *Psychology & Health*. 2007; 22:787–811.
- Centers for Disease Control and Prevention. National diabetes fact sheet: National estimates and general information on diabetes and prediabetes in the United States, 2011. U.S. Department of Health and Human Services; 2011. Retrieved from http://www.cdc.gov/diabetes/pubs/pdf/ndfs_2011.pdf
- Gleeson-Kreig JM. Self-monitoring of physical activity: Effects on self-efficacy and behavior in people with type 2 diabetes. *The Diabetes Educator*. 2006; 32:69–77. [PubMed: 16439495]
- Heisler M, Faul JD, Hayward RA, Langa KM, Blaum C, Weir D. Mechanisms for racial and ethnic disparities in glycemic control in middle-aged and older Americans in the Health and Retirement Study. *Archives of Internal Medicine*. 2007; 167:1853–1860. [PubMed: 17893306]
- Kessler RC, Andrews G, Colpe LJ, Hiripi E, Mroczek DK, Normand SLT, Zaslavsky AM. Short screening scales to monitor population prevalences and trends in non-specific psychological distress. *Psychological Medicine*. 2002; 32:959–976. [PubMed: 12214795]
- Kim G, Bryant AN, Goins RT, Worley CB, Chiriboga DA. Disparities in health status and health care access and use between older American Indians and Alaska Natives and non-Hispanic Whites in California. *Journal of Aging and Health*. 2012; 24:799–811. [PubMed: 22556392]

- Kim G, Chiriboga DA, Jang Y. Cultural equivalence in depressive symptoms in older White, Black, and Mexican American adults. *Journal of the American Geriatrics Society*. 2009; 57:790–796. [PubMed: 19484834]
- Kim G, Chiriboga DA, Jang Y, Lee S, Huang C-H, Parmelee P. Health status of older Asian Americans in California. *Journal of the American Geriatrics Society*. 2010; 58:2003–2008. [PubMed: 20929469]
- Kim G, Ford KL, Chiriboga D, Sorkin DH. Racial and ethnic disparities in healthcare use, delayed care, and management of diabetes mellitus in older adults in California. *Journal of the American Geriatrics Society*. 2012; 60:2319–2325. [PubMed: 23194086]
- King DK, Estabrooks PA, Glasgow RE, Osuna D, Toobert DJ, Faber AJ, Strycker LA. Self-efficacy, problem solving, and social-environmental support are associated with diabetes self-management behaviors. *Diabetes Care*. 2010; 33:751–753. [PubMed: 20150299]
- Kirkman MS, Briscoe VJ, Clark N, Florez H, Haas LB, Halter JB, Swift CS. Diabetes in older adults: A consensus report. *Journal of the American Geriatrics Society*. 2012; 60:2342–2356. [PubMed: 23106132]
- Krichbaum K, Aarestad V, Bueth M. Exploring the connection between self-efficacy and effective diabetes self-management. *The Diabetes Educator*. 2003; 29:653–662. [PubMed: 13677176]
- Kutner, M.; Greenberg, E.; Jin, Y.; Paulsen, C. The health literacy of America's adults: Results from the 2003 National Assessment of Adult Literacy. NCES 2006-483. U.S. Department of Education, National Center for Education Statistics; Washington, DC: 2006.
- Lanting LC, Joung IM, Vogel I, Bootsma AH, Lamberts SW, Mackenbach JP. Ethnic differences in outcomes of diabetes care and the role of self-management behavior. *Patient Education and Counseling*. 2008; 72:146–154. [PubMed: 18455354]
- Mukhtar Q, Jack L Jr, Martin M, Murphy D, Rivera M. Evaluating progress toward Healthy People 2010 national diabetes objectives. *Preventing Chronic Disease*. 2006; 3(1) Article A11.
- Osborn CY, Cavanaugh K, Wallston KA, Kripalani S, Elasy TA, Rothman RL, White RO. Health literacy explains racial disparities in diabetes medication adherence. *Journal of Health Communication*. 2011; 16(Suppl. 3):268–278. [PubMed: 21951257]
- Rapley P, Passmore A, Phillips M. Review of the psychometric properties of the Diabetes Self-Efficacy Scale: Australian longitudinal study. *Nursing & Health Sciences*. 2003; 5:289–297. [PubMed: 14622381]
- Richard P, Alexandre PK, Younis MZ, Lara A, Akamigbo AB. Racial and ethnic disparities in the quality of diabetes care for the elderly in a Nationally Representative Sample. *Ageing International*. 2012; 37:155–164.
- Ridner SH. Psychological distress: Concept analysis. *Journal of Advanced Nursing*. 2004; 45:536–545. [PubMed: 15009358]
- Sacco WP, Wells KJ, Vaughan CA, Friedman A, Perez S, Matthew R. Depression in adults with type 2 diabetes: The role of adherence, body mass index, and self-efficacy. *Health Psychology*. 2005; 24:630–634. [PubMed: 16287410]
- Sarkar U, Fisher L, Schillinger D. Is self-efficacy associated with diabetes self-management across race/ethnicity and health literacy? *Diabetes Care*. 2006; 29:823–829. [PubMed: 16567822]
- Traylor AH, Subramanian U, Uratsu CS, Mangione CM, Selby JV, Schmittiel JA. Patient race/ethnicity and patient-physician race/ethnicity concordance in the management of cardiovascular disease risk factors for patients with diabetes. *Diabetes Care*. 2010; 33:520–525. [PubMed: 20009094]
- Trief PM, Teresi JA, Eimicke JP, Shea S, Weinstock RS. Improvement in diabetes self-efficacy and glycaemic control using telemedicine in a sample of older, ethnically diverse individuals who have diabetes: The IDEATel project. *Age and Aging*. 2009; 38:219–225.
- U.S. Department of Health and Human Services. Indian Health Service Special Diabetes Program for Indians. 2011 Report to Congress: Making progress toward a healthier future; 2011. Retrieved from http://www.ihs.gov/MedicalPrograms/Diabetes/HomeDocs/Programs/SDPI/2011RTC_Layout_10102012_508c.pdf

- Wright CC, Barlow JH, Turner AP, Bancroft GV. Self-management training for people with chronic disease: An exploratory study. *British Journal of Health Psychology*. 2003; 8:465–476. [PubMed: 14614793]
- Wu AMS, Tang CSK, Kwok TCY. Self-efficacy, health locus of control, and psychological distress in elderly Chinese women with chronic illnesses. *Aging & Mental Health*. 2004; 8:21–28. [PubMed: 14690864]

Table 1
Background Characteristics of Elders With Diabetes (N = 3,067)

Variable	M ± SD or %						χ ² (F)
	Total (N = 3,067)	Non-Hispanic White (n = 2,153)	African American (n = 213)	Hispanic/Latino (n = 336)	Asian (n = 306)	AI/AN (n = 59)	
Type of diabetes							51.08***
Type 1	7.1	5.3	9.4	9.8	14.7	11.9	
Type 2	91.4	93.3	87.8	89.6	83.0	86.4	
Other type	1.5	1.4	2.8	0.6	2.3	1.7	
Age (60-85)	71.95 ± 7.63	72.53 ± 7.71	71.06 ± 7.51	69.26 ± 6.83	71.68 ± 7.25	70.69 ± 7.69	15.05***
Female	52.9	51.5	64.3	58.6	48.0	55.9	20.48***
Married	46.6	45.6	32.9	49.1	61.8	42.4	46.63***
Educational attainment							658.05***
Less than high school	14.7	6.9	10.8	58.6	22.5	23.7	
High school diploma	24.8	25.8	25.8	20.8	22.2	22.0	
Some college	60.4	67.3	63.4	20.5	55.2	54.2	
Household income							330.46***
<US\$20K	27.5	19.0	39.4	53.3	49.0	39.0	
US\$20K-US\$34K	22.2	22.5	20.7	27.4	15.7	22.0	
US\$35K-US\$74K	29.9	34.1	26.8	13.1	21.6	25.4	
US\$75K	20.4	24.4	13.1	6.3	13.7	13.6	
Disability							13.85**
With disability	62.8	63.5	64.3	64.3	53.6	71.2	
Without disability	37.2	36.5	35.7	35.7	46.4	28.8	
Comorbidity (0-3)	1.19 ± 0.78	1.22 ± 0.78	1.27 ± 0.78	1.08 ± 0.75	1.04 ± 0.75	1.22 ± 0.89	5.69***
Self-rated health (1-5)	3.32 ± 1.03	3.18 ± 1.01	3.53 ± 0.98	3.74 ± 0.92	3.75 ± 1.08	3.22 ± 1.12	41.07***
Diabetes self-efficacy (1 -4)	3.57 ± 0.63	3.62 ± 0.58	3.46 ± 0.67	3.50 ± 0.71	3.34 ± 0.75	3.66 ± 0.63	16.52***
Psychological distress (0-24)	2.81 ± 3.72	2.64 ± 3.41	2.50 ± 3.70	3.57 ± 4.39	3.24 ± 4.58	3.78 ± 4.80	6.85***

Note. AI/AN = American Indian and Alaska Native.

*** p < .01.

p < .001

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Table 2
Hierarchical Multiple Regression Analysis of Psychological Distress ($N = 3,067$)

Predictor	Outcome: Psychological distress			
	<i>B</i>	<i>t</i>	<i>R</i> ²	<i>R</i> ²
Step 1: Covariates			.167***	.167***
Age	-0.07***	-8.48		
Female	-0.02	-0.12		
Married	-0.43**	-3.12		
Educational attainment	-0.12	-1.25		
Household income	-0.44***	-6.41		
Comorbidity of chronic diseases	0.21*	2.58		
Disabled	1.24***	8.96		
Self-rated health	0.74***	10.92		
Step 2: Main effects			.031***	.198***
Race/ethnicity (Referent: non-Hispanic White)				
African American	-0.92***	-3.76		
Hispanic/Latino	-0.25	-1.09		
Asian	-0.20	-0.92		
AI/AN	0.68	1.53		
Diabetes self-efficacy	-1.03***	-10.07		
Step 3: Interaction effects			.004**	.202***
African American × Diabetes self-efficacy	-0.12	-0.32		
Hispanic/Latino × Diabetes self-efficacy	-0.87**	-3.01		
Asian × Diabetes self-efficacy	-0.74*	-2.57		
AI/AN × Diabetes self-efficacy	-0.57	-0.81		

Note. AI/AN = American Indian and Alaska Native.

* $p < .05$.

** $p < .01$.

*** $p < .001$.