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Discrimination and Chronic Kidney Disease among Caribbean Blacks: The Effects of Immigration and Social Status

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Abstract

This study examined the association between discrimination and chronic kidney disease (CKD) among Caribbean blacks and how this association varies by marital status, educational attainment, and length of U.S. residency within the frameworks for the stress buffering hypothesis and stress process model. The analysis was based on the Caribbean black subsample of the National Survey of American Life ($N=1551$). Logistic regression models were conducted to test the aims of this study. The findings indicate that the association between discrimination and CKD varied by length of U.S. residency, marital status, and education. Overall, the findings demonstrate the importance of considering immigration and sociodemographic context when investigating the relation between discrimination and CKD in immigrant populations.

Keywords

Caribbean black; Discrimination; Chronic kidney disease; Black immigrants; Stress buffering hypothesis

Discrimination and Chronic Kidney Disease among Caribbean Blacks

Discrimination has persisted as an important factor that has impacted health disparities in the U.S. Discrimination, both at individual and institutional levels is common to the historical and current experiences of minorities in the U.S. (Keith 2014). Discrimination impacts how minorities access and perceive health care services and even influences where and how minorities live. Keith (2014) describes residential segregation as a key dimension of institutional discrimination that contributes to health disparities by shaping the built environment where minorities live. Although most visible minorities have experienced discrimination in one form or another, discrimination have exacted a unique impact on black Americans. Recent literature has also found differences in reporting race-based discrimination among U.S.-born blacks and foreign-born blacks. The literature suggests that black immigrants are less likely to report racial discrimination than U.S.-born blacks, even

when exposed to similar types of discriminatory treatment. However, the reports of discrimination rise as these individuals reside longer in the U.S. (Krieger et al. 2011).

The present analysis examines the impact of discrimination on chronic kidney disease (CKD) among Caribbean blacks living in the U.S. and how this association may vary by immigration and sociodemographic characteristics. The following sections of the literature review will provide an overview of Caribbean black immigrants U.S. and discuss prior research on the link between discrimination and health among black Americans and immigrants and an overview of CKD in the U.S.

Caribbean Black Immigrants in the US

Caribbean Blacks are a distinct ethnic group within the black American population. Caribbean blacks constitute the majority of the black immigrant population in the U.S. (Acosta and de la Cruz 2011; Rastogi et al. 2011; Thomas 2012), and the majority of Caribbean black immigrants come from Jamaica (37%), Haiti (32%), and Trinidad and Tobago (11%) (Census Bureau 2010). Compared to other black immigrants, Caribbean blacks are more likely to hold U.S. citizenship and permanent residence status (Thomas 2012). The majority of Caribbean black immigrants come from English-speaking countries; thus, Caribbean blacks are more likely to be English-proficient than some other immigrant populations (Thomas 2012). Upon migration, most Caribbean blacks relocate to the Northeast region of the U.S. (e.g., New York, Boston) and Florida (Acosta and de la Cruz 2011) and tend to reside in Caribbean black enclaves, which are often located in black neighborhoods and areas of the city (Foner 2001). Moreover, many Caribbean black immigrants reside in extended family household, which allows them to pool their resources and share in childcare responsibilities (Thomas 2012). Given the long history of migration between Caribbean nations and the U.S., new arrivals are assisted by large, well-established networks of migrants in the U.S., who are often friends and extended family members of the new migrant (Foner 2001). These networks assist new migrants with locating employment and housing and integration into Caribbean black social networks upon arrival (Foner 2001). The racial experiences of Caribbean black immigrants in the U.S. stand in stark contrast to their experiences in their countries of origin (Foner 2001). In the U.S., Caribbean blacks are subsumed within the larger, more salient black racial category (Foner 2001). Blackness in Caribbean countries do not carry the same stigma as it does in the U.S. (Foner 2001); Caribbean blacks are often mistaken for African Americans and suffer similar mistreatments as their African-American peers (Foner 2001).

Discrimination and Health Among Blacks

Discrimination is pervasive in the lives of black Americans (National Public Radio, Robert Wood Johnson Foundation, & Harvard T.H. Chan School of Public Health 2017), and experiences of discrimination are often chronic and perceived as stressful (Clark et al. 1999). Thus, it is not surprising that discrimination, both at the individual and institutional level, is a risk factor for a wide range of physical illnesses among blacks. Some research suggest that individual discrimination—perceived experiences of unfair treatment in daily interactions with other persons—and institutional discrimination—policies and practices of societal

institutions that advantages one group over another (e.g., redlining)—have differing effects on health (Gee 2008). In particular, the limited evidence in this area indicates that individual discrimination may have a greater influence on health than institutional discrimination (Gee 2008). Because this analysis will focus on discriminatory experiences at the individual level, the following review of scholarship on the discrimination and health link will focus on health outcomes of individual discrimination. One of the most frequently investigated health outcomes of individual discrimination is cardiovascular diseases. For example, in a sample of older adults, Lewis et al. (2009, 2010) found that more frequent experiences of discrimination predicted higher blood pressure and greater levels of inflammation among African Americans. Among African-American women, chronic exposure to discrimination is associated with the presence of coronary artery calcification, which is a predictor of clinical cardiovascular events (e.g., heart attacks) in asymptomatic individuals (Lewis et al. 2006). Based on a national probability sample of African Americans and Caribbean blacks, Chae et al. (2012) identified a connection between racial discrimination and cardiovascular disease. Respondents in this study who reported high levels of racial discrimination were at greatest risk for cardiovascular disease. Moreover, discrimination has been linked to oxidative stress, which is a pathogenic mechanism for hypertension, insulin resistance, and cognitive aging (Szanton et al. 2012); cardiovascular reactivity (Williams and Mohammed 2009); poor self-rated health (Williams and Mohammed 2009); and breast cancer (in African-American women) (Williams and Mohammed 2009).

Discrimination and Health Among Immigrants

According to the Pew Research Center (2017), there are approximately 43.2 million immigrants living in the U.S.—nearly a fourfold increase since 1960. Immigration is a polarizing issue in the U.S. with many social and political consequences. Immigrant health has emerged as one of the major concerns for individuals arriving to the U.S. (Teitler et al. 2017). As immigration and immigrant health continue to remain in the national spotlight, it is important to understand how discrimination impacts the health of immigrants. It is impossible to discuss the current research on immigrant health without acknowledging the impact of discrimination and nativity status. Nativity is important not only because of growing anti-immigrant discrimination, but also because individuals born and raised outside of the U.S. have had less exposure to discrimination and must develop an understanding of their relative position within the racialized context of the U.S. (Krieger 2012). In previous research on the effects of discrimination among immigrants, physical health has been found to have a negative linear relationship with perceived discrimination among Hispanic and black immigrants (Ryan et al. 2006). That is, Hispanic and black immigrants who reported higher levels of discrimination had lower levels of overall physical health. Interestingly, in the same study, Ryan et al. (2006) found a U-shaped relationship between discrimination and blood pressure, indicating that respondents who reported moderate levels of discrimination had lower blood pressure than respondents who reported either low or high levels of discrimination. Additionally, respondents who reported high levels of discrimination had higher blood pressure than those who reported low levels of discrimination. Among Asian Americans, racial and language discrimination is associated

with more chronic health conditions (Yoo et al. 2009), and among Hispanic immigrants, discrimination is predictive of increased sleep disturbances (Steffen and Bowden 2006).

CKD in the United States

CKD is a major public health concern in the U.S. CKD is defined according to the presence of kidney damage for > 3 months and level of kidney function present (Inker et al. 2014). The kidneys are two fist-sized organs that are responsible for filtering blood and eliminating waste, toxins, and excess fluids. Kidneys that function properly are critical for maintaining good health; however, approximately one in seven American adults are estimated to have CKD (CDC 2017). Diabetes and high blood pressure are the most common causes of CKD in the U.S. If untreated, CKD can progress to kidney failure, and when the kidneys stop working entirely, dialysis or a kidney transplant is required for survival. Apart from it being a precursor to end stage renal disease (ESRD), CKD is now recognized as an important risk factor for other adverse outcomes such as acute kidney injury, cardiovascular disease, and premature death (Murphy et al. 2016).

The health consequences of CKD have exacted a large cost on the healthcare system as individuals living with CKD require extensive medication management and the treatments associated with ESRD are also quite costly. Medicare spending for all beneficiaries who have CKD (11% of total Medicare population) exceeded \$64 billion in 2015, and comprised one out of every five Medicare dollars (USRDS 2017). The combined sum of Medicare spending for individuals with CKD and ESRD amounts to nearly \$100 billion in 2015 (USRDS 2017).

Non-Hispanic blacks are nearly four times more likely to be diagnosed with CKD compared to Whites in the U.S. Although African Americans constitute around 13% of the U.S. population, approximately 35% of patients receiving dialysis are African American (National Kidney Foundation 2017). Blacks Americans are more likely to be diagnosed with diabetes and hypertension, which are among the most common causes of kidney failure. Among African Americans, diabetes, which has been estimated to affect 4.9 million African Americans over the age of 20, is the leading cause of kidney failure (National Kidney Foundation 2017). Previous research examining trends in the prevalence of CKD using data from the National Health and Nutrition Examination Survey found that although the prevalence for all other race groups has plateaued, CKD prevalence increased for blacks from the early 2000s through 2012 (Murphy et al. 2016).

Despite an established knowledge base regarding health disparities in chronic kidney disease, there is only one known published empirical study examining discrimination and kidney disease. Using data from the Healthy Aging in Neighborhoods of Diversity across the Life Span (HANDLS) study, an ongoing prospective cohort study of African Americans and Whites residing in Baltimore, Maryland, Beydoun et al. (2017) found that perceived racial and gender discrimination were linked to lower kidney function.

Focus of the Present Study

The connection between discrimination and disparities in kidney function can be explained by the stress process model. The stress process model is a guiding framework for research on the social determinants of health. At the core, the stress process incorporates three concepts: psychosocial stressors, coping resources, and health outcomes. Psychosocial stressors are life adversities that tend to derive from one's social location, which provokes the stress response. As it relates to discrimination, Williams et al. (1997) contends that discrimination is a type of chronic stressor that creates a sense of threat, elicits negative emotional states, and initiates the fight or flight processes that prepare the body for action (Keith 2014; Turner and Brown 2010).

A growing body of empirical evidence suggests that discrimination overtaxes an individual's ability to adapt over time, which in turn, leaves individuals more vulnerable to increased risk for physical morbidities, including kidney dysregulation (Bruce et al. 2009). Nevertheless, few studies have examined the relationship between discrimination and kidney function among adults. Although Beydoun et al. (2017) have found that discrimination negatively affects kidney function in African Americans, it remains unclear whether discrimination also shapes kidney function in another distinct black population—Caribbean blacks. Although Caribbean blacks are ethnically distinct from African Americans, they suffer from similar prejudices and mistreatments that African Americans endure. As a result, we expect that experiences of discrimination are associated with an increased risk for CKD among Caribbean blacks living in the U.S.

Given that we know very little about the association between discrimination and kidney function, our understanding of possible subgroup variations in this association remains unclear. However, there is reason to believe that the link between discrimination and kidney function may vary by sociodemographic characteristics, such as education and marriage (Pearlin 1989). First, in line with the stress process model, education is not only an important component of one's socioeconomic position (SEP), but also shapes access to social resources that can offset the health-related consequences of discrimination. Although we know that no study has examined the stress buffering role of education on kidney functioning, it is quite possible that the advantages associated with higher levels of education can offset the harmful influence of discrimination (see Zajacova and Lawrence 2018). The same may be true for marital status. Consistent with the stress process model, marital status is a social status characteristic that is directly and indirectly associated with greater levels of health among adults (Smith and Christakis 2008; Turner and Brown 2010), as well as protects against health decline (Umberson et al. 2010). Thus, it is plausible that marital status may offset the detrimental influence of discrimination on renal health. Moreover, according to the stress buffering hypothesis (Cobb 1976), social support can buffer against (or mitigate) the negative effects of stress on health. Married and cohabiting persons are likely to have a stable source of support in their intimate partners; this means that for these individuals, the social support that they receive from their partners could buffer against the detrimental effects of discrimination. Therefore, we anticipate that the positive association between discrimination and CKD will be weaker among married and cohabiting Caribbean blacks and Caribbean blacks with higher levels of educational attainment.

Given that minority immigrants may experience discrimination differently than minorities born in the U.S., as evidenced by the increase in reports of discrimination as the length of U.S. residency increases (Krieger et al. 2011), we predict that the association between discrimination and CKD would be stronger among U.S.-born Caribbean blacks than foreign-born Caribbean blacks.

Methods

Data

This study used data from the Caribbean black subsample of the National Survey of American Life: Coping with Stress in the twenty-first Century (NSAL), which is publicly available from the Inter-university Consortium for Political and Social Research (ICPSR). The NSAL was collected by the Program for Research on black Americans at the University of Michigan's Institute for Social Research (Jackson et al. 2004). A total of 6082 face-to-face interviews were conducted with respondents aged 18 and older within their homes from 2001 to 2003; 3570 interviews were of African-American respondents, 1621 of Caribbean blacks, and 891 of non-Hispanic whites. Respondents were compensated for their time. The overall response rate was 72.3%, and response rates for specific ethnic groups are as follows: 70.7% for African Americans, 77.7% for Caribbean blacks, and 69.7% for non-Hispanic whites. This survey employed a national multistage probability sampling design. The African-American sample is the core sample of this dataset, which includes 64 primary sampling units. The sample was drawn to represent the proportional national geographic distribution of African Americans. The Caribbean black sample was selected from two area probability sampling frames: the core NSAL sample and an area probability sample of housing units from geographic areas with a relatively high density of persons of Caribbean descent.

Respondents were considered Caribbean blacks if they indicated that they were black and answered affirmatively when asked if they were of West Indian or Caribbean descent, said they were from a country included on a list of Caribbean area countries presented by the interviewers, or stated that their parents or grandparents were born in a Caribbean country.

Measures

Discrimination—Discrimination was measured with a summary score of ten items of the Everyday Discrimination Scale (Williams et al. 1997), which assesses experiences of individual discrimination during the past 12 months: being treated with less courtesy or respect; receiving poorer service; being perceived as less smart, dishonest, or not as good as others; and being feared, insulted, harassed, and followed in stores (Cronbach's alpha = 0.89). Response categories ranged from 1 (*less than once a year*) to 5 (*almost everyday*), and discrimination scores ranged from 0 to 50. Research on the psychometric properties of the Everyday Discrimination Scale indicates that it has excellent internal consistency, test-retest reliability, convergent validity, and discriminant validity (Clark et al. 2004; Peek et al. 2011).

Chronic Kidney Disease—CKD was assessed using a self-report measure. Respondents were asked to report the presence of CKD that has been diagnosed by a doctor or health professional.

Sociodemographic and Immigration Factors—Length of U.S. residency assessed both the amount of time respondents spent in the U.S. and whether they were born in the U.S. This categorical variable was coded to differentiate between respondents who were born in the U.S. (reference category), lived in the U.S. for < 5 years, 5–10 years, 11–20 years, and > 20 years. The sociodemographic control variables used in the analyses included gender, education, age, family income, and marital status. Gender is coded as male = 1 and female = 2. Education (i.e., number of years of schooling), age, and family income (coded in dollars) are assessed as continuous variables. Missing data for family income and education were imputed using an iterative regression-based multiple imputation approach incorporating information about age, sex, region, race, employment status, marital status, home ownership, and nativity of household residents. Because of its skewed distribution, we used the log of family income. Marital status is represented by three categories: married or cohabiting; separated, divorced, or widowed; and never married.

Analysis Strategy

Logistic regression analyses were performed and odds ratio estimates and 95% confidence intervals are presented. The first model tests the influence of discrimination on CKD while controlling for demographic differences. Based on recommendations in the established and more recent literature on logistic regression (see Agresti 2013; Hilbe 2016; Hosmer et al. 2013), we test whether the association between discrimination and CKD varied by length of U.S. residency, marital status, and education, by testing three interaction terms: discrimination \times length of U.S. residency, discrimination \times marital status, and discrimination \times education. Each interaction was tested in separate models. Significant interactions were plotted with control variables set at their means. All analyses were conducted using Stata 15, which uses the Taylor expansion approximation technique for calculating the complex design-based estimates of variance. Standard error estimates were corrected for unequal probabilities of selection, non-response, poststratification, and the complex multi-stage clustered design of the NSAL sample. Results from these analyses are generalizable to the Caribbean black adult population in the U.S.

Results

Characteristics of the sample are presented in Table 1. Half of respondents were women, and the mean age of the sample was 41 years. On average, respondents' educational attainment level was a little beyond high school (13 years of schooling). Mean family income was approximately \$42,000. One in two respondents were either married or cohabiting, and nearly one in three respondents had never married. The remainder of respondents (19%) reported that they were either separated, divorced, or widowed. The majority of respondents (64%) were born outside of the U.S. Almost one out of four respondents (28%) had lived in the U.S. for more than 20 years. One out five respondents reported that they have lived in the U.S. for 11–20 years. The remainder of respondents indicated that they have lived in the

U.S. for < 11 years. Overall, respondents reported relatively low levels of discrimination ($M = 11.52$). However, it is important to note that even low levels of discrimination have a significant impact on mental and physical health (Levine et al. 2014). Close to 4% of respondents reported having been diagnosed with CKD.

In Model 1, we estimated the effects of discrimination on CKD while controlling for sociodemographic differences, indicated that discrimination was not significantly associated with CKD (Table 2). In Models 2 through 4, the moderating effects of length of U.S. residency, marital status, and education were tested. The significant interaction between discrimination and marital status indicated that the association between discrimination and CKD significantly differed between respondents who had never married and respondents who were either married or cohabiting. As Fig. 1 illustrates, among those who had never married, as discrimination increases, so did the probability of CKD. In contrast, discrimination was not associated with CKD among respondents who were either married or cohabiting. The significant interaction between discrimination and education demonstrated that among respondents with low levels of educational attainment, the probability of CKD increased with experiences of discrimination (Fig. 2). Conversely, among respondents with moderate and high levels of education, discrimination was not associated with CKD. Finally, the interaction between discrimination and length of U.S. residency indicated that the association between discrimination and CKD significantly differed between respondents who have resided in the U.S. for <5 years and U.S.-born respondents (Fig. 3). For respondents who were born in the U.S., discrimination was positively associated with CKD (Fig. 2). That is, the probability of being diagnosed with CKD increased as discrimination increased. However, for respondents who have resided in the U.S. for < 5 years, discrimination was not associated with CKD.

Discussion

The aim of this study was to examine the association between discrimination and CKD in a nationally representative sample of Caribbean blacks in the U.S. and how this association varies by length of U.S. residency, marital status, and education. This study makes several important contributions to the growing literature on discrimination among immigrants. First, this is the second study to interrogate the relation between discrimination and CKD. Investigations of CKD and its risk factors in black Americans are important because blacks are disproportionately affected by CKD (National Kidney Foundation). Yet, little is known about CKD in Caribbean blacks in the U.S. and psychosocial risk factors associated with this disease. This study sheds light on how discrimination interacts with sociodemographic and immigration factors to influence CKD in Caribbean blacks. Second, the current analysis provides a more nuanced examination of the link between discrimination and health by examining not only the direct effect of discrimination on CKD but also how this association varies by particular sociodemographic and immigration characteristics. This type of investigation addresses the complexities of intersectionality. Third, Caribbean blacks tend to be overlooked in research, as this population is often combined with African Americans in statistical analyses to represent a single homogenous group of black Americans. The practice of combining Caribbean blacks and African Americans into one undifferentiated group is problematic because Caribbean blacks are a substantially different population from African

Americans in life circumstances (e.g., immigration status, family structure) and culture (Taylor et al. 2013). The current analysis addresses this problem by focusing on Caribbean blacks as a distinct ethnic group for whom immigration factors are instrumental in shaping their interactions with society and health outcomes.

Surprisingly, discrimination was not related to CKD among Caribbean blacks. Although the only extant study to examine discrimination and CKD found that discrimination predicted lower kidney function (Beydoun et al. 2017), researches on the connection between discrimination and physical health outcomes have been equivocal. In particular, investigations of blood pressure have been mixed. Some studies have found that individuals who face high levels of discrimination are more likely to have high blood pressure (Peters et al. 2007) while other studies have found no association between discrimination and blood pressure (Davis et al. 2005). One possible explanation for the current null finding is that discrimination is extremely prevalent among black Americans. A recent national survey found that 92% of black Americans believe that discrimination against blacks exists in the U.S. today, and at least one out of two blacks reported personally experiencing racial discrimination in the workplace or in interactions with law enforcement (National Public Radio et al. 2017). Given the pervasiveness of discrimination in the lives of black Americans, discriminatory experiences, especially everyday discriminatory experiences, may not be perceived as highly stressful and thus do not result in changes in the neuroendocrine, autonomic, and immune systems that lead in chronic illnesses. In fact, although Davis et al. (2005) did not find an association between discrimination and hypertension, they did find that the perceived magnitude of stress derived from discrimination exposure was highly predictive of hypertension. Nevertheless, subpopulations that lack resources to effectively cope with discrimination may be more susceptible to its effect on health.

This was demonstrated in the significant discrimination by marital status and discrimination by education interactions. Among respondents who had never married, higher levels of discrimination were associated with greater probability of CKD. This is contrasted with no association between discrimination and CKD among respondents who were either married or cohabiting. Married and cohabiting persons have access to an intimate relationship and a stable source of social support, whereas individuals who had never married do not have access to this source of support. Social support is an important stress coping resource that buffers against a range of morbidities and mortality (Holt-Lunstad et al. 2010). Research on the healthful effects of marriage indicates that married individuals enjoy greater blood pressure dipping, life satisfaction, and lower risk of cardiovascular disease and mortality (Holt-Lunstad et al. 2008; Johnson et al. 2000). Conversely, never-married individuals are at greater risk for a number of physical illnesses and mortality (Johnson et al. 2000). Moreover, married and, to a certain extent, cohabiting individuals tend to have more economic resources (i.e., dual income) than never-married individuals (Brown et al. 2005) that can be used to cope with the stress of discrimination.

The significant interaction between discrimination and education revealed that among Caribbean blacks with low levels of formal education, discrimination was positively associated with CKD. However, among Caribbean blacks with moderate and high levels of

formal education, discrimination had no effect on CKD. This pattern of finding is consistent with the few extant studies that have examined how socioeconomic position (SEP) moderates the association between discrimination and health. For example, Borrell et al. (2006) found that among African-American women, the negative effects of discrimination on mental health were magnified among respondents with low income. This pattern may be due to the fact that compared to those with fewer years of formal education, those with more years of formal education have more material and social resources that enable them to effectively cope with discrimination and buffer against its harmful effects. Moreover, those with higher SEP tend to exhibit a greater sense of self-worth and self-efficacy (Twenge and Campbell 2002), which would enable them to use coping strategies that are associated with more positive health outcomes in response to experiences of discrimination, such as an active, problem-focused coping style (D'Anna et al. 2010).

Finally, length of U.S. residency significantly interacted with discrimination in predicting CKD. Discrimination was positively associated with CKD among Caribbean blacks who were born in the U.S. but was not associated with CKD among Caribbean blacks who have lived in the U.S. for < 5 years. This indicates that Caribbean blacks who are relatively new to the U.S. were able to avoid the detrimental health effects of discrimination. This pattern of finding is concordant with research indicating that length of residency in the U.S. moderates the negative effects discrimination on mental health (Gee et al. 2006). It may be that given the racialized context of the U.S., Caribbean blacks who were born in the U.S. have been exposed to discrimination stress for a substantially longer amount of time than Caribbean black immigrants new to the country. Relatively new immigrants have a shorter exposure period to discrimination. Thus, U.S.-born Caribbean blacks have greater cumulative exposure to discrimination and discrimination stress than Caribbean blacks who have resided in the U.S. for < 5 years. Because of their briefer period of exposure to discrimination stress, the coping resources of relatively new immigrants are less likely to be eroded than those of U.S.-born Caribbean blacks. This notion is in line with the “weathering hypothesis” (Geronimus 1992), which suggests that differential exposure to stress leads to disparities in the accumulation of stress over the life course and consequently contributes to health disparities. In the current analysis, the longer period of U.S. residency (which is accompanied by a greater period of exposure to discrimination stress) of U.S.-born Caribbean blacks may “weather away” the protective coping resources of these individuals and leave them more vulnerable to the harmful effects of discrimination.

Furthermore, coping resources, such as social support and racial/ethnic identity, may be differentially distributed between the two groups (i.e., U.S.-born and relatively new immigrant Caribbean blacks). Ancillary analyses (not shown) indicate that respondents who have resided in the U.S. for < 5 years were more likely to be married and more frequently received informal support from church members than their U.S.-born counterparts. As previously discussed, the protective qualities of marriage can buffer against the detrimental effects of discrimination. For many black Americans, church members are an important source of social support, and the immigrant church and its congregation play a major role in the lives of newer immigrants (Nguyen et al. 2016; Taylor et al. 2004). In addition to its religious function, the immigrant church serves a number of important roles for immigrants by (1) facilitating immigrants’ transition to a new culture via connections to established

social networks in the U.S.; (2) providing opportunities to meet and interact with other immigrants who have established residency in the U.S.; and (3) promoting assimilation by encouraging community and civic participation (Cadge and Ecklund 2007; Ecklund and Park 2005, 2007; Hagan and Ebaugh 2003). Relationships with church members are important for immigrants because they enhance their connections with other immigrants, reinforce a sense of ethnic identity, and provide emotional support critical for effective stress coping (Waters 1999).

Alternatively, newer immigrants may be more likely to perceive discrimination as isolated incidences and temporary impediments that are surmountable rather than permanent and systemic inequalities (Wise et al. 2007). The former perception may be more protective than the latter, which explains why discrimination was not associated with CKD among respondents who have been in the U.S. for < 5 years. Another explanation for this pattern of finding could be that immigrants may be more likely to use active, problem-focused coping style. Problem-focused coping, which is characterized by an active, problem-solving approach that seeks to change the situation from which the stressor arises in order to eliminate the stressor, is considered an adaptive coping strategy (Pearlin and Schooler 1978). Extant research on coping styles has demonstrated that using active, problem-focused coping reduced the levels of perceived stress (Farley et al. 2005) and the negative effects of discrimination on depression (Noh and Kaspar 2003) among Mexican Americans and Korean immigrants living in Canada. Thus, it is possible that Caribbean blacks who are relatively new arrivals may be more likely to use active, problem-focused coping style than their U.S.-born counterparts, and thus are protected from the harmful effects of discrimination.

Limitations of this study should be noted. Immigrant respondents' acculturation level was not assessed. Acculturation may confound the relationship between discrimination and CKD. Also, findings in this investigation are limited in generalizability to English-speaking Caribbean black adults living in the U.S., as the NSAL does not include respondents who do not speak English.

As immigration continues to emerge as an extremely polarizing issue in the U.S., how immigrants are treated and the patterns that emerge related to their health status have major implications for healthcare cost. It is important to understand that immigrants are a particularly heterogeneous group and that experiences related to discrimination may be highly variable within this population. This current analysis demonstrates that there is a connection to be explored between discrimination and immigration. This study demonstrates that the relation between discrimination and CKD among Caribbean blacks is nuanced. Although discrimination did not have a direct effect on CKD, it was associated with CKD when examining differences in length of U.S. residency, marital status, and educational attainment. This demonstrates the complexity and intersectionality of social and immigrant identities and how they relate to CKD in a nationally representative sample of Caribbean blacks. To address the limitations of this study, future research should include measures of acculturation and acculturation stress, a more diverse sample of Caribbean blacks, and longitudinal data, which would permit causal inferences. Furthermore, emerging evidence indicates that individual and institutional discrimination may impact health differentially,

and institutional discrimination may play a larger role in health outcomes in the absence of individual recognition of discrimination (Gee 2008). This finding has particularly important implications for black immigrants, who are less likely to report individual experiences of discrimination than U.S.-born blacks (Krieger et al. 2011). Consequently, future investigations should also determine the effects of institutional discrimination on CKD, and whether institutional and individual discrimination differentially influence CKD among Caribbean black immigrants. Finally, future research should determine if these interactive effects between discrimination and education and discrimination and marital status exist for other black American populations, such as African Americans.

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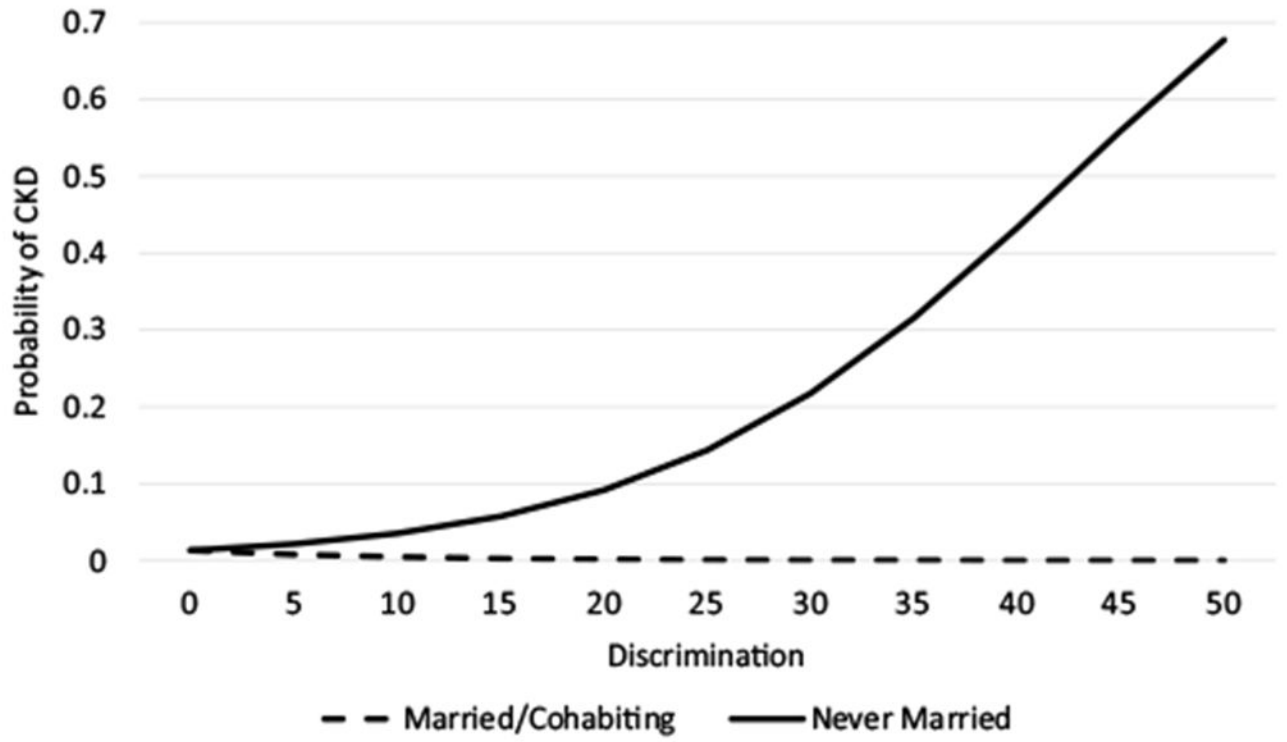


Fig. 1. Predicted probability of CKD by discrimination and marital status among Caribbean blacks

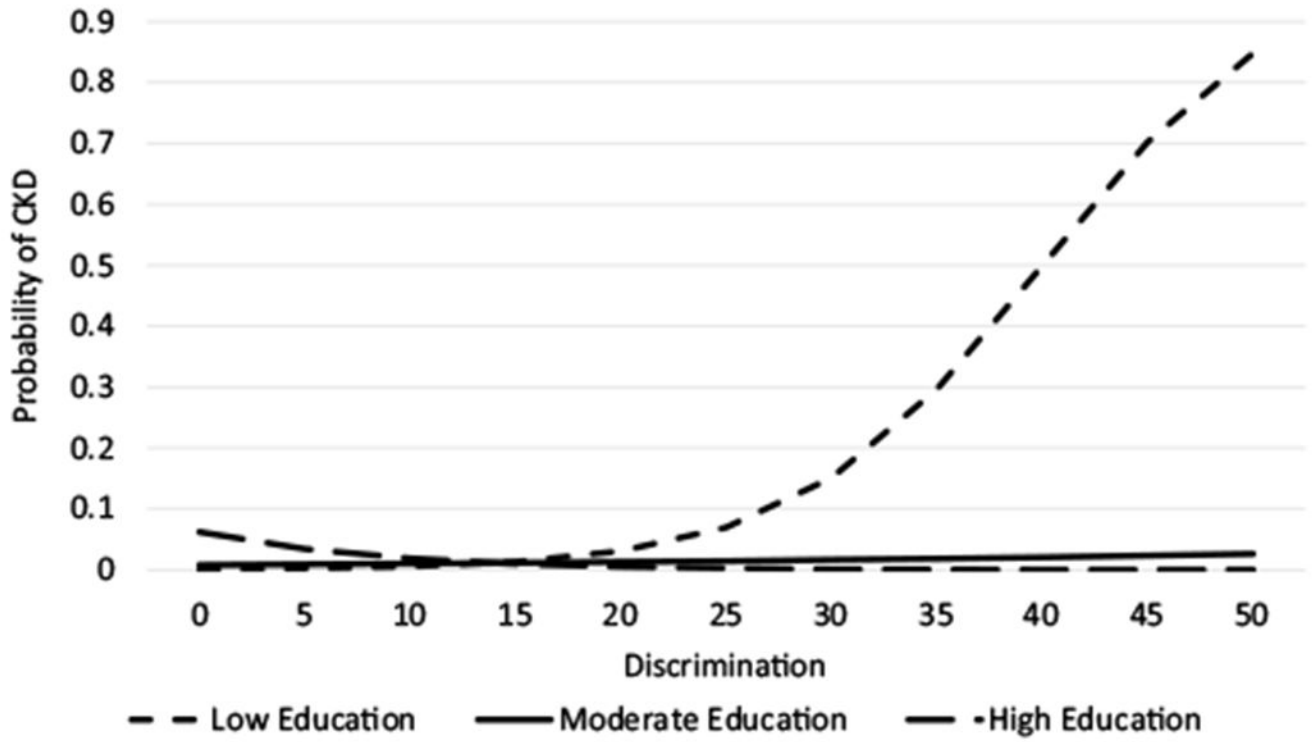


Fig. 2.
Predicted probability of CKD by discrimination and education among Caribbean blacks

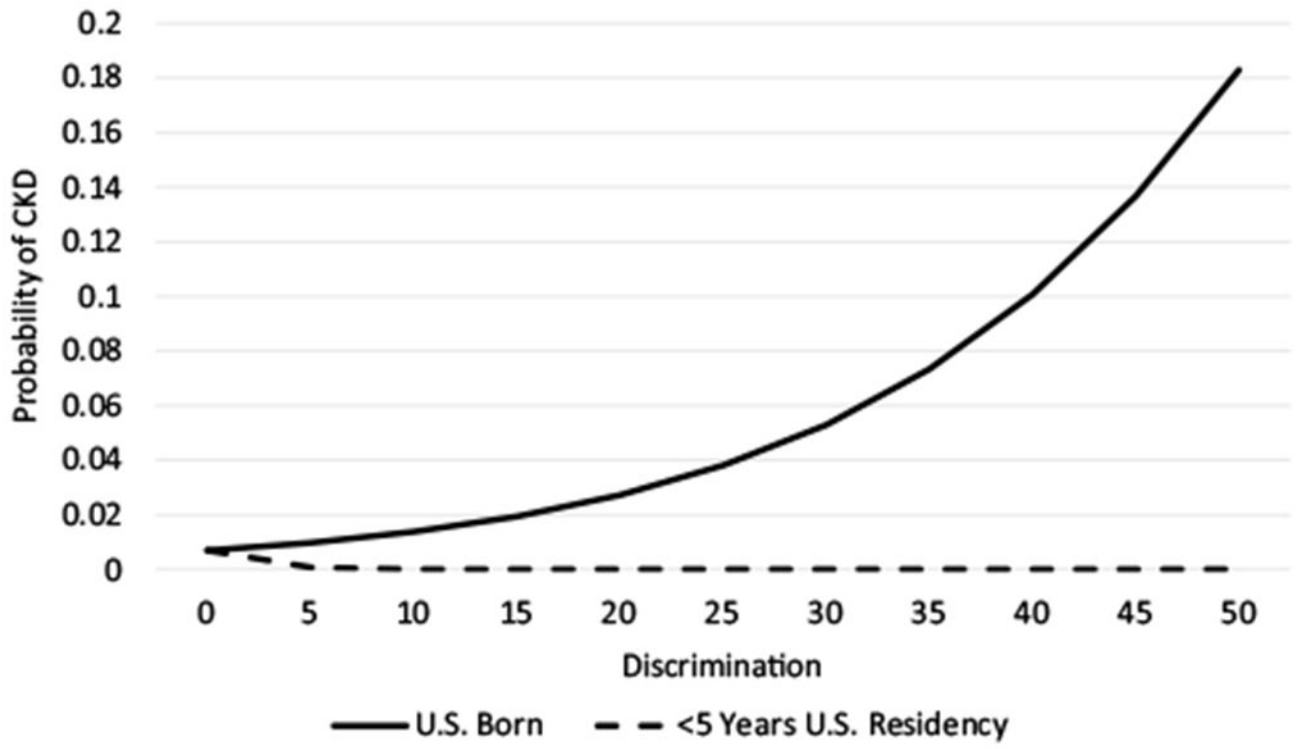


Fig. 3. Predicted probability of CKD by discrimination and length of U.S. residency among Caribbean blacks

Table 1Demographic characteristics of Caribbean blacks and distribution of study variables ($N= 1621$)

	% (Mean)	N (S.D.)	Range
Gender			
Male	50.87	643	
Female	49.13	978	
Age	40.99	15.53	18–94
Education	13.01	2.82	0–17
Family income	42065.02	38050.02	0–484000
Marital status			
Married/cohabiting	50.14	690	
Separated/divorced/widowed	18.94	384	
Never married	30.92	542	
Length of U.S. residency			
U.S. born	35.76	440	
< 5 years	7.89	119	
5–10 years	8.25	164	
11–20 years	19.91	364	
> 20 years	28.19	512	
CKD			
Yes	3.72	46	
No	96.28	1541	
Discrimination	11.52	8.73	0–50

Percentages and N are presented for categorical variables and Means and Standard Deviations are presented for continuous variables. Percentages are weighted and frequencies are unweighted

Table 2

Multivariable weighted logistic regressions for CKD among Caribbean blacks ($N = 1551$)

	OR (95% CI)			
	Model 1	Model 2	Model 3	Model 4
Discrimination	1.02 (0.92–1.13)	1.60 (1.22–2.10)**	0.91 (0.81–1.02)	1.07 (0.94–1.23)
Discrimination × marital status	–	–	–	–
Discrimination × separated/divorced/widowed	–	1.01 (0.83–1.21)	–	–
Discrimination × never married	–	1.22 (1.04–1.44)*	–	–
Discrimination × education	–	–	0.96 (0.95–0.98)**	–
Discrimination × length of U.S. residency	–	–	–	0.61 (0.42–.89)*
Discrimination × < 5 years	–	–	–	0.99 (0.82–1.20)
Discrimination × 5–10 years	–	–	–	1.02 (0.88–1.19)
Discrimination × 11–20 years	–	–	–	0.95 (0.82–1.10)
Discrimination × > 20 years	–	–	–	–
Women	0.57 (0.26–1.24)	0.78 (0.42–1.44)	0.61 (0.26–1.45)	0.51 (0.23–1.12)
Age	1.09 (1.04–1.14)***	1.09 (1.05–1.12)***	1.09 (1.04–1.13)***	1.09 (1.05–1.13)***
Education	1.06 (0.90–1.24)	1.69 (1.27–2.24)**	1.09 (0.95–1.24)	1.03 (0.90–1.18)
Family income	0.86 (0.52–1.41)	0.87 (0.61–1.26)	1.01 (0.62–1.64)	0.77 (0.57–1.04)
Marital status				
Separated/divorced/widowed	0.13 (0.02–.84)*	0.12 (0.02–.82)*	0.16 (0.02–1.23)	0.13 (0.02–.81)*
Never married	2.04 (0.69–6.04)	1.61 (0.65–3.99)	0.12 (0.02–.81)*	2.56 (1.02–6.42)*
Length of U.S. residency				
< 5 years	4.73 (1.09–20.43)*	3.15 (1.11–8.91)*	2.85 (0.75–10.79)	101.27 (5.51–1859.69)**
5–10 years	0.18 (0.03–1.30)	0.19 (0.03–1.19)	0.18 (0.02–1.36)	0.29 (0–18.25)
11–20 years	0.23 (0.05–1.01)	0.24 (0.06–0.95)*	0.20 (0.04–1.10)	0.23 (0.01–7.01)
> 20 years	0.22 (0.05–1.03)	0.18 (0.04–0.77)*	0.15 (0.02–0.94)*	0.61 (0.02–16.35)

OR odds ratio, CI confidence interval. Reference category for discrimination × marital status = discrimination × married/cohabiting, discrimination × length of U.S. residency = discrimination × U.S. born, gender = male, marital status = married/cohabiting, length of U.S. residency = U.S. born.

* $p < 0.05$;

1000.0 > *d*

; 10.0 > *d*
**

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