International Journal of Allied Research in Sociology and Anthropology (IJARSA)
Volume.1, Number 1; March-2023;
Published By: Zendo Academic Publishing
https://zapjournals.com/Journals/index.php/ijarsa
14131 Alder St NW, Andover, Minnesota, USA
zapjournal@gmail.com, editorial@zapjournals.com

Exploring the Influence of Social Factors and Stress on the Self-Perceived Health of Caribbean Diaspora: Evidence from the United States, Guyana, and Jamaica

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Abstract: This study investigates the self-perceived health of Caribbeans within and outside the Caribbean region or the Caribbean Diaspora and explores the associations with social factors, sources of stress, and health-related conditions. The study is based on population-based samples of Caribbean people in the United States, Guyana, and Jamaica. Descriptive statistics and multivariate logistic regression were used to analyze the data. The study found that the health of Caribbeans generally deteriorates with age, and sources of stress like discrimination and neighborhood violence are associated with fair or poor self-assessed health. Depression and hypertension also contribute to individuals' assessment of their health. Gender, socioeconomic status, and skin color also play important roles in influencing health outcomes. The study emphasizes the need to examine other influences of health among Caribbean Diaspora populations, including sources of stress that are generally underexplored in empirical studies. The findings provide essential evidence for policymakers and interventions designed to address the health of Caribbeans, particularly as more Caribbean people are migrating to countries throughout North America and Europe.

Keywords: Caribbean Diaspora, self-perceived health, social factors, stress, discrimination, hypertension, depression.

INTRODUCTION

Research geared towards understanding the health of domestic and migrant groups provides compelling evidence of differences in health outcomes (Viruell-Fuentes et al. 2012; Schwartz et al. 2012; William and Mohammed, 2009). While it is almost common knowledge that the health of immigrants erodes over time when compared to host country citizens, very little is known about specific sources that might contribute to changes in health, including discrimination and neighborhood factors of violence (Breslau et al. 2009; Nicklett and Burgard 2009; Williams et al. 2007). As a group, the Caribbean population has expanded and gained notice as a distinct but understudied diaspora population, representing one of the fastest-growing subgroups within the United States. Despite these population patterns, there is relatively little research focusing on social factors and sources of stress that may influence the health of Caribbeans across the diaspora.

It is also becoming more apparent that mental health is an important predictor of physical health (Callan et al. 2015; Meyer et al. 2014). With few exceptions, there have been very limited studies to understand health-related factors in conjunction with other sources in estimating the selfperceived health of individuals (Assari et al. 2016; Woodward et al. 2010; Jayaweera and Quigley, 2010). Studies suggest a multidimensional approach might provide a better understanding of the health trajectory of Caribbean individuals (Porter 2019; Hass 2018; Griffith et al. 2011; William 2005; Stein and Nayamathi, 1998). Exploring such realities

are necessary as Caribbean society is in the midst of epidemiological transition, where more Caribbean people are migrating to countries throughout North America and Europe (Allahar 2010; Chaney 1989). By understanding the issues facing the Caribbean population within the region and across the diaspora, policies and intervention measures specific to the health of Caribbeans would be informed by reliable data. This study uses population-based samples to explore the influences of self-assessed health status of Caribbean people within the Caribbean and the United States.

Social Factors and Health

Prior research has identified age, gender, and socio-economic factors as important predictors of health outcomes (Williams et al. 1997; House et al. 1988). Cross-cultural research has long found that the health of individuals tend to deteriorate as they get older (Frey and Stutzer, 2010) and is more susceptible to poorer health outcomes (Crimmins, 2002; Sahyoun et al. 2001). Studies find that older individuals, particularly within the Caribbean region, are prone to chronic illnesses such as diabetes, hypertension, arthritis, and cancer (Assari 2014; Brown et al. 2007; Palloni and McEniry, 2007). Higher rates of substance abuse were found among Jamaican Blacks over the age of sixty (Lacey et al. 2016). These trends have also been noted among Caribbean Blacks across the diaspora. Associations with poor mental and physical health were found among older Caribbeans living in the United States and England (Lacey et al. 2015; Williams et al. 2007; Jackson et al. 2004).

Research has found different gendered health patterns related to chronic health illnesses and mental health conditions exist (Ross and Bird, 1994; Umberson, 1992). There is evidence that men are at greater risk for chronic illnesses and diseases in comparison to women (Peters et al. 2014). Studies conducted in Jamaica have shown a greater prevalence of cardiovascular diseases, including diabetes, stroke, and heart disease, among men (Harris et al. 2017; Abdullkadri et al. 2015). Similarly, Guyanese men report more chronic and recurring illnesses than women (Hosler and Kammer 2017; Lowe et al. 2015). In other studies, it has been found that women were at greater risk for hypertension (Mitchell et al. 2017; Jindal et al. 2016). Women were also found to be at increased risk for fair or poor health outcomes (Lacey et al. 2016a). While limited population-based studies have focused on the mental health of Caribbean descendants, the few conducted have shown a greater likelihood of women meeting criteria or being diagnosed with depressive episodes in comparison to men (Williams et al. 2007; Schreiber et al. 2000). Conversely, females fared much better in comparison to their male counterparts in relation to substance abuse rates (Lacey et al. 2016; Lacey et al. 2015; Broman et al. 2008).

Socioeconomic status measured by education, income, and occupation can have both positive and negative influences on health (Choi et al. 2015). For instance, more educated individuals are likely to make informed health-related decisions for themselves and their families (Shankar et al. 2013; Choi et al. 2015; Corak, 2013; Williams and Collins, 1995). Conversely, those with unfavorable economic circumstances and class positions have widely been found to have poorer health outcomes (Braveman et al. 2011; Syme, 1998; Turner, 1995).

Sources of Stress and Health

When considering precursors of health outcomes, experiences with discrimination have additionally been associated with health and health disparities (Soto et al. 2011; Williams and Mohammed, 2009; Pascoe and Smart Richard, 2009; Paradies 2006; Williams et al. 2003). A large and growing body of research within the United States has shown perceived and actual discrimination to be associated with poor mental and physical health among Blacks (Krieger et al. 2011; Williams and Mohammed, 2009; Mays et al. 2007; Williams et al. 2007). Although there is profound evidence of the negative impact of discrimination on health and well-

being, there are debates about its effect on other ethnic groups, including Caribbean people due to a rather minimal investigation (e.g., Taylor et al. 2017). Studies conducted on Caribbean people in England and the US have found an association between racism and poor self-rated health (Bacares et al. 2014; Breslau et al. 2005). Recognizing the potential effect of discrimination on the health of individuals, there is a need for additional studies on Caribbean descendants, especially within the Caribbean region where there is limited available information along this dimension.

To contextualize possible linkages between discrimination and health within the Caribbean region, consideration should be given to gender, race, ethnicity, class, and skin color, which tends to play a more significant role in the social and cultural Caribbean context (Wade, 2017; Howard, 2001). Such realities are important because they tend to differ from the North American racialization of people due to the Caribbean colonial history and settlement (Hunter, 2002; Duany, 1998). In most Caribbean societies, there is a larger variation of people of African descent which correlates to different skin tone gradients (Jackson and Corthran, 2003). Studies further recognize that people with lighter skin tone are likely to be more privileged than those with darker skin tone (Cueva et al. 2016; Monk 2015; Hunter 2002). In Jamaica, for instance, an important determinant of social positioning, economic status, and personal growth has been attributed to the color of one's skin (Charles and McLean, 2017; Miller, 1969). Skin color has been associated with discrimination within the region, with lighter skin tone individuals having more advantaged life chances (Charles and McLean, 2017; Miller, 1969). Monk (2015) further asserted that skin tone is a significant predictor of multiple forms of perceived discrimination, which in turn is a significant predictor of health outcomes among African-Americans. Cuevas and colleagues (2016) more recently found skin color to be a strong predictor of life chances and the health of individuals.

Statistics indicate that the rate of crime and violence in the Caribbean region is one of the highest in the world (Gaona et al. 2015). Research conducted in the United States found that around three-quarters of Caribbeans were exposed to crime in their neighborhood (Jackson et al. 2017). Community violence can have profound health implications (Gee and Payne-Sturges 2013; Clark et al. 2008). Along with the potential for directly causing harm, exposure to violence has been linked to psychological distress, depression, anxiety, PTSD. and suicidal ideation (APA, 2017; Mair et al. 2010, Fowler et al. 2009; Krug et al. 2002). The distrust, insecurity, and fear created by neighborhood violence can also result in risky behaviors like smoking and changes in sleep patterns (Gaona et al. 2015; Johnson et al. 2006). There is further evidence that this source of stress may encourage a sedentary lifestyle and limit physical activities, thereby increasing BMI levels and the risk for obesity (Yu and Lippert, 2016; Roux and Mair, 2010; Richardson et al. 2006). Outside the context of intimate partner violence, however, the effect of violence on the well-being of Caribbean descendants remains unclear. Given the persistent exposure to violence, along with escalating crime rates in Latin American and Caribbean countries in recent years, it becomes particularly necessary to better understand the health risk associated with exposure to community violence among Caribbean descendants within and outside the region.

Linking Mental Health with Physical Health

More recently there is greater recognition of the bidirectional relationship between mental and physical health (Gunnell et al. 2016). It is becoming more apparent that mental health is an important predictor of physical health (Callan and Mathews, 2015; Meyer et al. 2014). That is, people with mental illness are at higher risk for chronic conditions (Kemp and Quintana, 2013; Gadalla, 2008). Research further shows that lower depression predicted higher levels of physical health status (Di Benedetto et al. 2014).

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Yet, other studies have suggested the opposite (Callan et al. 2015; Triguero-Mas et al. 2015). It has been noted that people with chronic conditions are at increased risk for anxiety and depression (Cho et al. 2011; Gadalla, 2008). For instance, a large number of cancer patients suffer from depression (Koloppa et al. 2013). Among Jamaican youth with diabetes, many had anxiety which influenced their quality of life (Tulloch-Reid and Walker, 2009). In spite of better recognition of issues surrounding mental illnesses among Caribbeans across the diaspora, there has been little resolution of the influence of mental health on self-perceived physical health, a valid measure of health and health trajectory (Schonfeld et al. 2016; Frost et al. 2015, Conner et al. 2015; Sirois, 2015).

Theoretical Models

This study applies two theoretical models to reflect area-levels of influence that can impact the Caribbean population's health outcomes. *The Social Determinant of Health Model* (SDOH) asserts that social circumstances in which people are born, grow, live, work, and age will influence their health outcome (WHO, 2008; Johnson et al. 2006). The social circumstances of the model indicate that the economic and political mechanisms that influence individual independence to control one's destiny is based on access to income, education, and occupation, as well as how society perceives elements of gender, and race/ethnicity identities. Social structures, including key institutions, are driven by those elements which recognize that having more positive social circumstances equates to greater access to power and control. On the contrary, individuals with fewer attributes or undesirable social circumstances are destined to encounter more challenges and relegated to a lower social stratum of society (Williams and Sternthal, 2010; Hayward and Gorman, 2004; Williams, 2003; Williams and Collins ,1995). The innovative application of the SDOH in this study is a comparative assessment of SDOH among Caribbean people, attributed to the social factors that might be unique to this subpopulation.

The *Transactional Model of Stress and Coping* has been applied as a framework to identify the complex set of emotional reactions, appraisals, and coping responses that are linked to how social determinants contribute to stress and coping (Lazarus and Folkman, 1987). The model has two central concepts: *appraisal*, that is, individuals' evaluation of the significance or impact of an event to their well-being, and *coping*, individuals' efforts in thought and action to manage specific demands. This framework helps us to operationalize and assess how coping and stress are linked to patterns of social determinants such as income, education, gender, race/ethnicity, particularly within the context of our population. The Transactional Model of Stress and Coping attend to the social realities that may perpetuate how Caribbean people at home and in the United States diaspora manage stress and enact their coping strategies based on the social determinants of health. Such a vantage point aids in better understanding the impact of social factors of health among Caribbean people living within and outside the region and how they handle it in terms of stress and coping.

Research Questions

This study aims to address the following questions: (1) what roles do social factors, sources of stress, and health-related conditions play in the self-perceived health of Caribbeans across three geographic locations within the diaspora?; and (2) do self-perceived health statuses differ among the geographic locations?

METHODOLOGY

United States Data

Data on Caribbean individuals residing within the United States (2003), Guyana (2005), and Jamaica (2005) were analyzed. For the US sample, we analyzed data from the National Survey of American Life (NSAL), the largest and most comprehensive study of the health of US Blacks, and the first nationally representative sample of Caribbean people residing in the US (see Jackson et al. 2004a, Jackson et al. 2004b, Heeringa et

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al. 2004). Multistage probability sampling procedures were used to select a sample of 6082 participants: 3570 African Americans, 891 nonHispanic White, and 1623 Caribbean Blacks. Caribbean Blacks, the focus of this analysis, were identified through two overlapping area probability sampling frames. A total of 266 Caribbean Blacks were interviewed in the NSAL core sample. The remaining 1357 Caribbean Black participants were selected from an area probability sample of housing units from high-density Caribbean areas in the United States. Eight primary areas were selected in five states, including New York, New Jersey, Florida, Connecticut, and Massachusetts, and the district of Washington, DC, comprising around 80% of the Caribbean population. Participants in the sample that selfidentified as Caribbean Black answered in the affirmative on whether they: (a) were of West Indian or Caribbean descent, (b) were from a Caribbean area country, or (c) had a parent or at least one grandparent who was born in a Caribbean area country (Williams et al. 2007). Face-toface interview was the main source of data collection, with a smaller proportion (14%) of interviews conducted by phone on adult participants (18 years and older). Data were collected between February 2001 and June 2003. The response rate for the US Caribbean sample was 77 percent.

Caribbean Data

The Caribbean region sample is based on the NSAL replication and extension study. The Family Across Generation and Nations (FAGN) was geared to examining the health and well-being of families across contexts and included separate data collection in Guyana and Jamaica (see Jackson et al. 2004a; Lacey et al. 2016b). These data collections used an abridged version of the NSAL questionnaire. Information was collected on neighborhood safety, religious affiliation, support, discrimination, and social and demographic factors. In Guyana, adult participants were randomly selected in the urban, suburban, and rural regions between July and December 2005. Questionnaires were administered by indigenous interviewers to selected adults (18 years and older). Overall, 2068 participants completed the questionnaire. The sample consisted of individuals who self-identified as Black (55%), East Indian (34.7%), and Other (10.1%). The response rate was 82 percent.

Similar probabilistic sampling procedures used in Guyana were employed to generate the sample of adult participants residing in Jamaica. Face-to-Face interviewing was conducted on regional random selected adults (18 and older) in the urban Kingston Metropolitan region, St. Andrew, and Portmore areas between August and December 2005. A total of 1218 interviews were completed. Individuals who self-identifed as Blacks (97.4%), Asians (1.3%), and Other (1.4%) were represented in the sample. The response rate was 72%, slightly lower than that of Guyana.

Social Factors

Social and economic factors include age (continuous), sex (male, female), education (less than high school, high school graduates, college), household income (bottom quintile, second quintile, middle quintile, fourth quintile, highest quintile), occupation status (unemployed, employed, not in the labor force) and length of time/generation status. Length of time/generation status in the US for Caribbean descendants included those who had immigrated between 0 to 10 years, 11 to 20 years, more than 20 years, as well as second and third generation participants. Second generation participants were born in the United States to at least one Caribbean immigrant parent. Third-generations consisted of US-born blacks whose parents were born in the United States and had Caribbean born grandparents.

Sources of Stress

Sources of stress are inclusive of discrimination and neighborhood violence. Two markers of discrimination, appropriate for the respective contexts, were used in this study. Considering that the US data focused on

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Caribbean Black respondents, along with vulnerabilities to racial discrimination, and a history of enslavement by Whites (e.g., Rogers and Mosley, 2006) participants were asked: "How often [do] Whites treat you badly because of the shade of your skin"? By contrast, due to historical differences in colonial settlement and the diverse ethnic make-up of the Caribbean region, participants within the region were asked: "How often would you say that people of other races treat you badly because of the shade of your skin color?" Both questions were measured on a Likert scale, with response options of: (1) very often (2) fairly often (3) not too often (4) hardly ever, and (5) never. The measures were reversed coded for analysis, with positive responses given a higher endorsement. A single measure was used to examine neighborhood violence. Participants were asked, "Thinking about your neighborhood, how often are there problems with muggings, burglaries, assaults, or anything like that in your neighborhood?" Responses include: (1) very often (2) fairly often (3) not too often (4) hardly ever and (5) never. The measure was also reverse recoded for analysis.

Mental and Physical Health

The mental health of participantswas assessed with a modified version of the World Health
Organization Composite International Diagnostic Interview (WHO CIDI) defined by the Diagnostic and Statistical Manual of Mental Disorder, Fourth Edition (DSM-IV). The disorders included lifetime substance and major depression disorders.

Physical health was assessed by asking participants to indicate whether they had been diagnosed with hypertension or "high blood pressure" by a doctor or health professional. The response option was "yes" or "no". They were further asked, "How would you rate your overall physical health. Response options were: (1) excellent (2) very good, (3) good, (4) fair, and (5) poor. This measure was recoded to reflect fair or poor health ratings versus the other categories (good/very good/excellent).

Analytic Strategy

We used descriptive statistics, and multivariate logistic regression analytic procedures to address the study goals across datasets. Sample weights were applied to the multivariate analyses. In the US, sampling weights accounted for the multistage cluster design, unequal probabilities of selection, non-response, post-stratification to calculated weighted nationally representative population estimates, and standard errors. Post-stratification weights based on census estimates of age and gender were applied to the samples in Jamaica and Guyana. Stata 16.0 was used to analyze the data (StataCorp, 2019). Significance was set at the .05 alpha level.

RESULTS

Sample Description

The average age of participants varied slightly across regions. Jamaican participants were generally younger (m = 38.9) in comparison to their counterparts. Across all regions, females made up the majority with a higher percentage (69.5%) represented in Jamaica. The marital status of participants also differed; a higher percentage of US Caribbean participants (37.2%) were married compared to around a third (34.2%) of Guyanese participants; Jamaican participants tended never to marry (56.6%). The educational level of participants was also different. Over half of Guyanese (54%) participants achieved less than a high school education compared to about half (49.1%) of US Caribbean participants who had a college education. A higher proportion (49.8%) of Jamaicans graduated from high school. Across regions, most participants were employed. The percentage was, however, higher (75.2%) in the United States. Similarly, US Caribbeans were more represented within the highest quintile category (31.6%) compared to Jamaicans and Guyanese who had greater representation in the fourth (42.4%) and second (30.0%) quintile categories respectively.

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Finally, the US sample largely comprised firstgeneration Caribbean descendants who had migrated to the country for more than 20 years (27.5%).

[Table 1 here]

Multivariate Analysis

Multivariate analysis shows the association of social factors, sources of stress, and health conditions to fair or poor health ratings among Caribbeans residing in the region and the United States when other factors were controlled. The results show increased odds for fair or poor health ratings with age among participants residing in both Guyana (AOR=1.04, $p< .001$) and Jamaica (AOR = 1.03, $p< .001$) (see Table 2). US women compared to US men of Caribbean heritage (AOR = 1.81, $p< .011$) additionally had increased odds of reporting their health as fair or poor. The odds for reported self-perceived fair or poor health further increased among Caribbean participants residing in Guyana (AOR = 2.13, $p< .05$), Jamaica (AOR = 2.65, $p < .01$) and the US (AOR = 3.09, $p < .01$) with less than a high school education compared to college educated individuals. This was also the case for Jamaican who were high school graduates (AOR = 2.78, $p < .01$).

While income was not associated with fair or poor health for Caribbeans within the region, the odds significantly increased across various categories within the US among bottom quintile (AOR = 2.51, $p < .01$), middle quintile (AOR = 3.94, $p< .001$) and the fourth quintile (AOR =
3.14, $p < .05$) participants compared to high quintile participants. Increased odds for fair or poor health were additionally found among participants residing in Jamaica (AOR = 1.66, $p< .05$) and the United States (AOR = 2.14, $p< .01$) for those not in the labor force compared to employed individuals.

Approaching significance, exposure to violence increased the risk for (AOR = 1.17, $p = .053$) self-perceived fair or poor health in Guyana. Participants residing in Jamaica (AOR = 1.27, $p<.05$) and the US (AOR = 1.27, $p< .001$) who experienced discrimination had increased odds of reporting their health status as fair or poor compared with those without such an experience. Furthermore, US Caribbean participants that met the criteria for major depressive disorder had increased odds (AOR = 4.27, $p< .001$) for fair or poor health compared with those who did meet such criteria. Participants residing in Guyana (AOR = 3.55, $p< .001$) and Jamaica (AOR = 3.05, $p< .001$) diagnosed with hypertension likewise had increased odds for fair or poor health compared with those without this diagnosis. Opposite results, however, were found among Caribbeans residing in the United States. The odds (AOR = .704, $p < .001$) for fair or poor health reduced among those diagnosed with hypertension by a physician compared with those who did not have such diagnosis within this population.

[Table 2 here]

DISCUSSION

From population-based samples, this study shows cross contextual similarities and differences in associated factors of fair or poor self-perceived health among Caribbeans residing in the Caribbean region and the United States. By and large this study showed that participants residing in Jamaica and Guyana were predisposed to fair or poorer self-rated health with age. This was particularly evident among Jamaicans and Guyanese. The finding is related to the possible health risks that naturally come with age (Grifith et al. 2011). This was not the same for those in the United States.

This study also found that Caribbean women residing in the United States were more likely to rate their health as fair or poor. Although the results might be associated with diet, it could just as well reflect the accumulation of stress from assuming multiple roles both within and outside the home as suggested by Role Strain Theory (Pearlin, 1989; Greenhaus and Beutell, 1985; Sieber, 1974). Such revelation is particularly

relevant to the social determinants of health model, as it signals how gender and associated norms of inequality for women contribute to poorer health outcomes. However, this relationship was not found within the Caribbean region. This can be explained by differences in social support and coping mechanisms among individuals within the region, in addition to an environment that is known to be less stressful in comparison to the US context (Taylor et al. 2017; Alfred, 2003)

In a similar vein of the SDOH model application, it was discovered that socio-economic factors, particularly education, were associated with self-perceived health of Caribbean people. As with other studies, individuals of lower socioeconomic status were at greater risk for fair or poor selfrated health (De Maio, 2010; Santiago-Rivera et al. 2002). Those with lower education or were not employed specifically, tended to face such realities within the Caribbean region and the United States. However, participants' income produced mixed results in the United States, as individuals within various categories were associated with fair or poor self-rated health. Although difficult to explain, we assume that other factors, interacted with income, may have influenced this outcome. As previously identified in our discussion about the SDOH model, and re-affirmed with the Transactional Model of Stress and Coping, we conclude that possible resources within particular socio-economic settings contribute to both positive and negative attributes of how Caribbeans are able to manage their health under stressful conditions.

Sources of stress were associated with the fair or poor self-rated health status of Caribbeans across contexts. For example, fair or poor self-rated health may be associated with neighborhood violence and discrimination. Consistent with research, Caribbean Blacks in the United States who experienced discrimination by Whites were at increased risk for fair or poor self-rated health (Karlsen and Nazroo, 2002; Read et al. 2005; Veenstra, 2011). This study also found an association between discrimination and fair or poor self-rated health in Jamaica. Therefore, it is apparent that discrimination both within the US and across the Caribbean diaspora does impact the well-being of individuals, though limited attention has been devoted to understanding the health effects within the region.

This research showed that both physical and mental health was associated with self-rated fair or poor health for which the Transactional Model of Stress and Coping denotes that individuals are likely to describe their health in terms of their health practices. Among US Caribbean residents, major depression increased the likelihood of fair or poor self-rated health, further underscoring that mental conditions such as depression could heighten the risk for physical health problems (Griffith et al. 2011). As also found in the Heart and Soul Study (e.g., Ruo et al. 2003), the relationship between self-rated poor health and depression found among Caribbeans residing in the United States might reflect the perceived structural conditions encountered by minority and immigrant groups to host countries. Opposite to this finding, an association was not found between depression and self-assessed health among participants within the Caribbean region. We can only speculate that stronger support and social networks, serving as a protective factor against mental conditions and subsequently poor self-perceived health of this population. In spite of this, the lack of association might reflect the possible underestimation of cases of depression within the region due to continued stigmas associated with mental disorders (Lacey et al. 2016b).

Within the Caribbean, Jamaicans and Guyanese individuals diagnosed with hypertension were more likely to rate their health as fair or poor (Hayes et al 2008). This finding sheds light on the serious health risk that hypertension poses to well-being, and possibly shaping the health and outlook of individuals within the Caribbean region. Caribbeans within the US diagnosed with hypertension, on the other hand, were less likely to report their health as fair or poor. One possible explanation for this finding may be that individuals

within the US context have greater access to resources and health insurance to address their health needs, which in turn provides an encouraging position and outlook of their health status and health outcome.

Limitations

This study has several limitations that should be addressed, including the use of different discrimination measures across regions. Despite the difference in measures, they were appropriate for addressing contextual differences and provided insight into Caribbean peoples' experience with discrimination. Also, the data collected on Caribbeans in the US focused on those of African descent and did not capture the entire population. As evident by the racial and ethnic make-up within the Caribbean region (e.g., Guyana, Trinidad), the population is quite diverse and includes various racial and ethnic groups. The study additionally focused on health conditions that Caribbeans are known to be affected by, and may provide a stronger foundation for understanding the health of Caribbeans across contexts. The health measures used also had adequate sample sizes that allowed for exploration. Furthermore, the study focused on a subjective health measure. We examine the self-assessed health status of Caribbean descendants as it is widely regarded as an important predictor of general health and a valid measure of future health outcomes (Schonfeld et al. 2016; Frost et al. 2015; Conner et al. 2015; Sirois 2015). Although subsequent analyses (noted under table 2) showed associations between sources of stress and objective measures of health across populations, additional studies are necessary to explore this relationship. Also, the data analyzed for the study were collected over a decade ago. The age of the data should not be of relevant concern as the study assessed association which is less likely to change over this time span (Lee et al. 2013). Finally, cross-sectional data were analyzed for this study, limiting causal inferences.

Benefits of the Study

Limitations aside, this study provided a basis for understanding the cross contextual health similarities and differences of Caribbeans. For example, low educated Caribbean participants across regions tend to report fair or poorer self-rated health. Yet, for other social factors such as income, and health-related conditions including major depression, and hypertension, there were differences across the Caribbean diaspora. Likewise, this study was one of the few studies to examine the effect of social conditions on the health of Caribbeans. In particular, the study addressed rarely examined sources of stress such as neighborhood violence and discrimination, that are part of the experience of Caribbean people both within and outside the region. Finally, the study examined the relationship of health-related factors (mental and physical) in association with self-perceived health, a topic that has seldomly been evaluated, especially among this population.

CONCLUSION AND FUTURE RESEARCH

This study underscores the need for additional research that incorporates contextual influences and social sources of stress among the Caribbean population that has been overlooked or underresearched. These are important areas to consider for future studies as increasing crime rates and as well as changing migration patterns of various racial and ethnic groups across the Caribbean region may result in racial division and tension. As evident by this and other studies, these factors can have a tremendous effect on the health and well-being of individuals. In evaluating stressful influences such as discrimination cross-culturally, we must consider the use of culturally-appropriate measures that accurately reflects the Caribbean experience.

Importantly, future studies are necessary that address other physical and mental health conditions that contribute to poor health. By addressing some of these gaps, we will be able to explore possible policies and intervention measures for this population group within and outside the region.

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International Journal of Allied Research in Sociology and Anthropology (IJARSA)
Volume.1, Number 1; March-2023;
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Table 1 Sample Characteristics

Characteristics	**Guyana N=2068**	**Jamaica N=1218**	**US Caribbeans N=1621**
Age (mean age)	40.5	38.9	40.3
Sex			
Female	51.8	69.5	50.9

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Male	48.2	30.5	49.1
Relationship Status			
Married	34.2	20.0	37.6
Partnered	16.0	13.2	12.6
Sep-wid-div	18.6	9.9	18.9
Never married	31.2	56.6	30.9

Education			
Less than High School	54.0	28.3	18.9
High School Graduates	29.7	49.8	29.7
College-Voc-Tec	16.3	21.9	51.5
Income			
Bottom Quintile	14.0	21.1	14.0
Second Quintile	30.0	24.3	14.7
Middle Quintile	23.4	1.6	18.9
Fourth Quintile	22.4	42.4	20.9
Highest Quintile	10.2	10.7	31.6
Employment Status			
Unemployed	10.8	28.6	8.8
Not in the Labor Force	35.5	27.4	16.0
Employed	53.7	44.1	75.2
Length of Time/Gen Status			
0-10 years	---	---	18.2
11-20 years	---	---	19.4
More than 20 years	---	---	27.5
Second Generation	---	---	20.8
Third Generation	---	---	14.1
Neighborhood Violence			
Never	20.7	7.6	18.0
Hardly ever	35.8	31.7	34.5
Not too often	28.0	37.0	28.9
Fairly often	8.4	13.0	12.2
Very often	7.2	10.7	5.5
Discrimination			
Never	45.2	75.3	25.8
Hardly ever	33.7	14.2	25.1
Not too often	14.4	6.8	31.6

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Fairly often	4.9	2.1	9.8
Very often	1.8	1.6	7.6
Substance Abuse			
Yes	4.7	2.7	9.6
No	95.3	97.3	90.4
Major Depression			
Yes	4.1	7.4	13.3
No	95.9	92.6	86.7
Hypertension			
Yes	14.6	14.1	27.8
No	85.4	85.9	72.2

*Note.*The US Caribbean sample comprise participants from the following countries: Jamaica, Barbados, Guyana, Trinidad and Tobago, Anguilla, Antigua, Bahamas, Belize, Bermuda, B.V.I, Tortola, Cayman Island, Dominica, Grenada, Montserrat, St. Kitts-Nevis, St. Lucia, St. Vincent, Turks and Caicos, US Virgin Islands, St. Thomas, St. Croix, West Indies, British West Indies. Costa Rica, Nicaragua, Honduras, Puerto Rico, the Dominican Republic, and Cuba, Aruba, St. Eustatius, St. Maarten,Suriname, French Guiana, Guadalupe, and Martinique.
*Data are weight.

Table 2 Examining Social, Environment and Physical and Mental Health on Fair or Poor SelfRated Health

Characteristics	**Guyana AOR(CI)**	**Jamaica AOR(CI)**	**US Caribbeans (AOR(CI)**
Age	1.04(1.02-1.05)***	1.03(1.01-1.04)***	.998(.982-1.02)
Gender			
Female	.995(.657-1.51)	1.18(.767-1.80)	1.74(1.09-2.71)*
Male	1	1	1
Education			
Less than High School	2.13(1.04-4.37)*	2.65(1.23-5.72)**	3.09(1.47-6.52)**
High School Graduates	1.56(.728-3.37)	2.78(1.53-5.07)***	1.41(.809-2.45)
College-Voc-Tec	1	1	1
Income			
Bottom Quintile	.943(.490-1.81)	1.20(.551-2.61)	2.51(1.38-4.55)**
Second Quintile	1.07(.576-1.98)	.874(.432-1.77)	1.75(.506-6.03)
Middle Quintile	1.09(.591-2.00)	.399(.051-3.14)	3.94(1.88-8.25)***
Fourth Quintile	.805(.405-1.60)	1.00(.463-2.17)	3.14(1.08-9.19)*
Highest Quintile	1	1	1

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Occupation Status			
Unemployed	1.33(.705-2.51)	1.68(.951-2.97)	1.10(.531-2.27)
Not in the Labor Force	1.03(.657-1.62)	1.66(1.07-2.55)*	2.14(1.20-3.82)**
Employed	1	1	1
Gen Status/Length of Time			
Third generation	---	---	1.51(.621-3.68)
Second generation	---	---	2.00(.971-4.11)
More than 20 years	---	---	2.09(.857-5.10)
11-20 years	---	---	1.32 (.654-3.06)
0-10 years	1	1	1
Neighborhood Violence	1.17(.998-1.36)	1.11(.943-1.30)	1.09(.880-1.35)
Discrimination	.915(.754-1.11)	1.27(1.04-1.54)*	1.27(1.15-1.42)***
Substance Abuse			
Yes	.973(.461-2.05)	.912(.271-3.07)	1.36(.475-3.92)
No	1	1	1
Major Depression Disorder			
Yes	1.57(.769-3.21)	1.69(.922-3.10)	4.27(2.21-8.24)***
No	1	1	1
Hypertension			
Yes	3.55(2.27-5.56)***	3.05(1.87-4.97)***	.711(.591-.854)***
No	1	1	1

Note. *p< .05 ** p< .01 *** p< .001

a. Adjusting for socio-demographic factors, neighborhood violence had a positive effect (AOR = 1.45, p <.05) on substance abuse among US Caribbeans

b. Adjusting for socio-demographic factors, neighborhood violence had a positive effect on major depression disorder among Caribbeans in the US (AOR = 1.35, p< .01), Guyana (AOR = 1.76, p< .001) and Jamaica (AOR = 1.26, p< .05); discrimination had a positive effect (AOR=1.30, p< .05) on major depression disorder in Guyana