The Role of Social Context in Racial Disparities in Self-Rated Health

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Abstract Race disparities in self-rated health in the USA are well-documented, such that African Americans rate their health more poorly than whites. However, after adjusting for health status, socioeconomic status (SES), and health behaviors, residual race differences are observed. This suggests the importance of unmeasured variables. Because African Americans and whites tend to live in differing social contexts, it is possible that accounting for social and environmental conditions may reduce racial disparities in self-rated health. Differences in self-rated health among whites and African Americans were assessed in a low-income, urban integrated community (Exploring Health Disparities in Integrated Communities (EHDIC)) and compared with a national sample (National Health Interview Survey (NHIS)). Controlling for demographics, SES, health insurance, status, and behaviors, African Americans in NHIS had higher odds of reporting fair or poor health (odds ratio

[OR] = 1.40, 95% confidence interval [CI] = 1.18–1.66) than whites. In EHDIC, there was no race difference in self-rated health (OR = 0.83, 95% CI = 0.63–1.11). These results demonstrate the importance of social context in understanding race disparities in self-rated health.

Keywords Self-rated health · Race · Social context

Introduction

Self-rated health is an important predictor of mortality and morbidity [1–3]. Racial disparities in self-rated health are well-documented such that African Americans consistently rate their health more poorly than whites [4]. These race differences persist after adjusting for health status and other determinants such as socioeconomic status (SES) and health behaviors [4–9]. This suggests that factors beyond the individual may contribute to poorer self-rated health among African Americans [8].

One exogenous factor often implicated in racial health disparities is social context [10, 11]. Due to racial residential segregation, African Americans tend to live in different social contexts than whites, and these environments are often less conducive to health [10]. Racially segregated, unhealthy social contexts have been associated with increased mortality and morbidity outcomes such as weight status, cancer, emotional well-being and smoking [12, 13]. Individuals living in segregated, less healthy social contexts may experience more stress due to concentrated poverty and social disorder, such as crime. Persistent environmentally induced

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stress may contribute to self-rated health directly and through poorer psychological health [2], and thus exacerbate health disparities among African Americans.

Social context and segregation are associated with poor self-rated health among African Americans [14, 15]. Though studies of social context and self-rated health have been performed, the findings are inconsistent. One study found no association between segregation and poor self-rated health [15], while another found positive associations among African Americans, but not whites [14]. Another found that accounting for neighborhood context accounted for some of the racial difference in self-rated health, but not all of it [16].

Another method of examining the role of social context is to examine race disparities in an integrated population [11, 17]. Studies using this method have found that race disparities in hypertension [18, 19], diabetes [20], obesity [21, 22], physical inactivity [23, 24], and tobacco and alcohol use [23, 25] within a racially integrated community are either reduced or eliminated when compared to a nationally representative sample. Given that accounting for social context has rendered race differences in various outcomes insignificant in previous studies [18–25], and that these health outcomes have been associated with self-rated health [8, 9, 26–29], it is plausible that race differences in self-rated health may be mitigated in an integrated urban, low-income community.

To account for racial patterning in exposure to unhealthy social contexts and account for potentially important unmeasured characteristics of social environments, a community that is racially integrated and where there were no significant race difference in socioeconomic status was identified. In doing so, social context is treated as a constant. The objective of this study is to determine whether race differences in self-rated health exist after accounting for the social context. Race differences in self-rated health were examined in an urban, low-income, integrated community and these results were compared to a nationally representative sample. It was hypothesized that race differences would be diminished in the urban, low-income racially integrated population.

Methods

Exploring Health Disparities in Integrated Communities (EHDIC) is an ongoing multi-site study of race disparities

within communities where African Americans and whites live together and where there were no race differences in socioeconomic status (SES), as measured by median income and percentage of high school graduates [17]. The EHDIC study site was in Southwest Baltimore, Maryland (EHDIC-SWB), a low-income urban area.

EHDIC-SWB was a cross-sectional face-to-face survey of the adult population (aged 18 and older) of two contiguous census tracts. In addition to being economically homogenous, the study site was racially balanced, with almost equal proportions of African American and white residents. The racial distribution was 51% African American and 44% white, and the median income for the study area was \$24,002, with no race difference. The census tracts were block listed to identify every occupied dwelling in the study area. During block listing, 2618 structures were identified. Of those, 1636 structures were determined to be occupied residential housing units (excluding commercial and vacant residential structures). After at least five attempts, contact was made with an eligible adult in 1244 occupied residential housing units. Of that number, 65.8% were enrolled in the study resulting in 1489 study participants (41.9% of the 3555 adults living in these two census tracts recorded in the 2000 Census). Because the survey had similar coverage across each census block group included in the study area, bias to geographic locale and its relationship with socioeconomic status is minimal [17].

Comparisons to the 2000 Census for the study area indicated that the EHDIC-SWB sample included a higher proportion of African Americans and women, but was otherwise similar with respect to other demographic and socioeconomic indicators [17]. For instance, the sample was 59.3% African American and 44.4% male, whereas the 2000 Census data showed the population was 51% African American and 49.7% male. Age distributions in the sample and 2000 Census data were similar with the median age being for both samples of 35–44 years. The lack of race difference in median income in the census, \$23,500 (African American) vs. \$24,100 (white) was replicated in EHDIC \$23,400 (African American) vs. \$24,900 (white).

The survey was administered in person by trained interviewers and consisted of a structured questionnaire, which included demographic and socioeconomic information, self-reported height and weight, self-reported health behaviors and chronic conditions, and three blood pressure (BP) measurements. The EHDIC study has been described in greater detail elsewhere [17]. The study was approved by the Committee on Human Research at the

Johns Hopkins Bloomberg School of Public Health. The study sample included non-Hispanic African Americans and whites aged 20 years or older ($n = 1351$).

The National Health Interview Survey (NHIS) is a nationally representative annual survey conducted within the home of study participants [30, 31]. The NHIS was conducted by the U.S. Census Bureau for the National Center for Health Statistics. The target population was all civilian and non-institutionalized households in the USA. The survey used a multistage sampling design which includes stratification, clustering, and simple random sampling. The sample design included oversampling of African Americans, Hispanics, Asians, and persons aged 65 and older. NHIS included questions regarding demographic characteristics, health status, health behaviors, functional limitations, cancer screening, and health care access and utilization. NHIS included a Sample Adult Core, which randomly samples one adult from each household to receive the full survey, and included 30,852 adults in 2003, and 24,128 non-Hispanic whites and African Americans were included in this study.

Self-rated health was determined by response to the following, “In general, would you say your health is excellent, very good, good, fair, or poor?” Self-rated health was dichotomized as follows: 0 = excellent, very good, or good; 1 = fair or poor. Some previous studies measure self-rated health continuously or categorically [4, 6, 7, 9, 15, 32], or measure “excellent” or “very good” self-rated health [5, 8]. The majority of the literature dichotomizes [2, 5, 8] or measures “fair” or “poor” self-rated health [4, 15], particularly in studies that examine racial segregation and social context [14, 16, 32, 33]. Moreover, poor self-rated health predicts mortality among the elderly [1]. Race was self-reported and included only those who were non-Hispanic black or non-Hispanic white (hereafter referred to as African American and white).

Other covariates included demographic, SES, healthcare, health status, and health behaviors. Demographics included age (continuous), gender (female, male), marital status (currently, formerly, never), and current employment (no, yes). SES variables included educational attainment (less than high school graduate, high school graduate/GED equivalent, more than high school) and poverty-to-income ratio (less than 1.00, 1.00 to 1.99, 2.00 to 3.99 and 4.00 or greater). A dichotomous covariate to represent health insurance status was included. Health status covariates were measured dichotomously and included obesity (defined by self-reported BMI greater than or equal to 30 kg/m²), having ever been told by a doctor if

the respondent had hypertension, heart disease, cancer, a stroke, diabetes, or any pulmonary disease including asthma, emphysema, and chronic bronchitis. Health behaviors included physical inactivity (no, yes), smoking status (currently, formerly, never), and drinking status (currently, formerly, never).

The mean and proportional differences between racial groups for demographic, SES, health insurance and health-related characteristics were evaluated using Student's t for continuous variables and chi-square tests for categorical variables. The odds of reporting fair/poor health among African Americans compared to whites were calculated using logistic regression models that controlled for demographics (Model 1), SES (Model 2), health insurance (Model 3), health status (Model 4), and health behaviors (Model 5). Following the procedure recommended by the National Center for Health Statistics [34], all analyses in NHIS used Taylor-linearization procedures for the complex multistage sampling design and a weight variable was created to account for combining of multiple years of NHIS. P values less than 0.05 were considered statistically significant and all t tests were two-sided. All statistical procedures were performed using STATA statistical software, version 14 (StataCorp LP, College Station, TX).

Results

Race differences in demographic and health-related characteristics in NHIS and EHDIC-SWB were shown in Table 1. In NHIS, African Americans and whites had similar percentages of employment, and reporting having had a stroke or pulmonary disease. African Americans were younger, less likely to be male, married, have more than a high school education, to have a poverty-to-income ratio (PIR) greater than 4.00, be insured, have heart disease, or cancer. African Americans were more likely than whites to be obese, have hypertension, diabetes, be physically inactive, and to have never smoked and never drank in NHIS. In EHDIC-SWB, African Americans and whites had similar proportions of males, those having more than a high school education, those having a poverty-to-income ratio (PIR) greater than 4.00, and similar percentages of respondents who were obese, had hypertension, stroke, and diabetes. African Americans in EHDIC were younger, less likely to be married, more likely to be employed, high school graduates, insured, have recently seen a physician, less likely to have heart disease, cancer, pulmonary disease, be physically

Table 1 Select demographics and health-related characteristics by race, NHIS 2003 and EHDIC-SWB

	NHIS 2003			EHDIC-SWB		
	White <i>n</i> = 20,052	African American <i>n</i> = 4076	<i>p</i> value	White <i>n</i> = 573	African American <i>n</i> = 835	<i>p</i> value
Age, mean $\pm$ S.E.	47.1 $\pm$ 0.2	42.6 $\pm$ 0.4	< 0.001	43.9 $\pm$ 0.7	38.4 $\pm$ 0.5	< 0.001
Male (%)	48.0	44.5	0.004	43.1	45.6	0.350
Marital status (%)						
Currently	66.0	44.1	< 0.001	25.7	15.2	< 0.001
Formerly	17.1	22.9	< 0.001	37.2	22.8	< 0.001
Never	16.9	33.0	< 0.001	37.1	62.0	< 0.001
Employed (%)	63.2	62.2	0.291	36.7	48.9	< 0.001
Education (%)						
Less than high school graduate	11.7	20.9	< 0.001	47.5	35.4	< 0.001
High school graduate/GED	27.9	29.0	0.239	34.2	45.1	< 0.001
More than high school	60.4	50.1	< 0.001	18.3	19.5	0.598
PIR (%)						
Less than 1.00	8.4	20.4	< 0.001	38.5	44.0	0.040
1.00 to 1.99	14.7	22.8	< 0.001	26.5	26.9	0.864
2.00 to 3.99	31.8	31.4	0.701	22.4	17.5	0.026
4.00 or more	45.2	25.5	< 0.001	12.7	11.6	0.523
Insured (%)	88.4	79.7	< 0.001	59.8	65.1	0.043
Obese (%)	25.5	36.7	< 0.001	29.9	32.1	0.384
Hypertension (%)	26.0	33.3	< 0.001	27.3	26.1	0.623
Heart disease (%)	8.3	5.8	< 0.001	15.4	8.7	< 0.001
Cancer (%)	8.1	3.2	< 0.001	8.4	3.1	< 0.001
Stroke (%)	2.5	3.0	0.114	4.4	3.4	0.318
Diabetes (%)	6.4	8.9	< 0.001	11.8	9.4	0.150
Pulmonary disease (%)	13.7	13.1	0.359	29.8	18.9	< 0.001
Physically inactive (%)	63.0	74.6	< 0.001	25.7	19.4	0.005
Smoking status (%)						
Currently	22.7	21.5	0.167	58.8	53.7	0.055
Formerly	25.0	14.3	< 0.001	16.4	8.9	< 0.001
Never	52.3	64.2	< 0.001	24.8	37.5	< 0.001
Drinking status (%)						
Currently	65.3	49.3	< 0.001	43.0	48.4	0.047
Formerly	14.6	15.5	0.215	40.4	31.1	< 0.001
Never	20.1	35.2	< 0.001	16.6	20.5	0.065
Fair/poor self-rated health (%)	11.2	17.6	< 0.001	37.4	28.2	< 0.001

inactive, and more likely to have never smoked or never drank. In NHIS, a greater percentage of African Americans rated their health as fair or poor (17.6%) compared to whites (11.2%, $p < 0.001$). Contrarily, in EHDIC, whites were more likely to rate their health as fair or poor (37.4%) compared to African Americans (28.2%, $p < 0.001$).

The associations between race and self-rated health by dataset were displayed in Table 2. After adjusting for demographic variables (Model 1), African Americans in NHIS had twice the odds of fair/poor health as whites (odds ratio [OR] = 2.03, 95% confidence interval [CI] = 1.78–2.32). In Model 2, after controlling for SES,

Table 2 Association between race and self-rated health, NHIS 2003 and EHDIC-SWB

	NHIS 2003		EHDIC-SWB	
	OR	95% CI	OR	95% CI
Model 1	2.03	1.78–2.32	0.84	0.66–1.08
Model 2	1.43	1.23–1.67	0.80	0.62–1.04
Model 3	1.44	1.23–1.67	0.81	0.63–1.05
Model 4	1.37	1.16–1.62	0.82	0.62–1.09
Model 5	1.40	1.18–1.66	0.83	0.63–1.11

Model 1 controls for age, gender, marital status, and employment. Model 2 controls for covariates in Model 1 and education and PIR. Model 3 controls for covariates in Model 2 and insurance status. Model 4 controls for covariates in Model 3 and obesity, hypertension, heart disease, cancer, stroke, diabetes, and pulmonary disease. Model 5 controls for covariates in Model 4 and physical inactive, smoking, and drinking status

African American/white odds ratio in NHIS was diminished to 1.40 (95% CI = 1.18–1.66), and remained relatively static after additionally controlling for health insurance (Model 3), health status (Model 4), and health behaviors (Model 5). For Model 1 in EHDIC, there was no race difference in reporting fair/poor health after controlling only for demographics (OR = 0.84, 95% CI = 0.66–1.08). After additionally adjusting for SES, health insurance, health status and behaviors, the African American/white odds ratio in EHDIC was 0.83 (95% CI = 0.63–1.11).

Discussion

The objective of this study was to compare race differences in self-rated health in an integrated community to those in a nationally representative dataset. In NHIS 2003, after adjusting for demographics, socioeconomic status (SES), health insurance, health status, and health behaviors, African Americans had higher odds of rating their health as fair or poor compared to whites. In EHDIC, however, there was no race difference in self-rated health. The results suggest that social context accounts for residual racial disparities in self-rated health after accounting for demographics, health status and health behaviors.

The results from the national dataset are consistent with previous studies that found residual race differences in self-rated health [4–9]. The results from EHDIC are consistent with a study by Finch et al., which found that neighborhood context accounted for much of the racial

disparity in self-rated health [16]. The current study also agrees with other studies using EHDIC data that find that racial disparities are eliminated or diminished in this racially integrated neighborhood.

The finding of no racial disparities in this social context that may be more prevalent among African Americans than among whites suggests that racial disparities in self-rated health are associated with a social context like that of the EHDIC Study: urban and low-income. This is further exemplified by the observation that both whites and African Americans in EHDIC having higher rates of fair/poor self-rated health than in the national sample. This type of social context may lead to poorer mental health and psychosocial factors such as depression, locus of control, social support, and stressful life events, which have been found to be related to self-rated health [29].

Studies have shown that African Americans differ from whites in terms of the factors that are considered when rating one's health [35, 36]. It is possible that African Americans and whites living in the same urban, low-income social context rate health in similar ways. Another potential explanation is the concept of health pessimism. Health pessimism occurs when a poorer subjective rating of health is not associated with poorer objective ratings of health [37]. That is, health pessimism occurs when objective health is equal among two groups, but one group rates their health worse than the other. If this occurs, ratings of health are more associated with “enduring self-concepts” rather than “spontaneous assessment” [37]. Health pessimism has been proposed as an influential factor in rating self-rated health among African Americans causing residual race differences in self-rated health [8, 38], and may be a factor (in addition to social context) related to the higher odds of reporting fair/poor health among African Americans in NHIS. The causes of health pessimism are not fully understood, though one study found that experiences of maltreatment explained race differences in self-rated health that were purportedly caused by greater health pessimism in African Americans [38]. Whites living in a low-income, urban context may experience maltreatment or other life events that could be associated with health pessimism and higher rates of fair/poor self-rated health.

Both African Americans and whites living together in a low-income and urban social context had worse self-rated health than those in the national dataset had. Therefore, worse self-rated health and other outcomes such as hypertension [18, 19], diabetes [20], obesity [21, 22], and various health behaviors [23, 24] among

African Americans in national estimates may be due to the poorer social contexts in which African Americans are more likely to reside compared to whites. This assertion is demonstrated by the observation that whites who live under the same social contexts have similarly poor self-rated health as African Americans. Racial disparities in self-rated health may be due to the social context of “place” rather than race itself.

This study demonstrates the importance of social contextual factors related to “place” as a social determinant of racial health disparities that previously have been neglected in nationally representative data analyses, but is gaining attention for self-rated health [32, 33] and a variety of health outcomes [39–45]. However, many of these studies are not able to examine racial health disparities between African Americans and whites living in the same neighborhood. African Americans disproportionately reside in urban, low-income communities that may lead to poorer health outcomes. Whites who live in these same contexts are often overlooked and understudied [46]. The results of the current study and other related studies demonstrate that African Americans and whites living under the same social context (low-income and urban) have similar health outcomes that are worse than national estimates. This social context may affect self-rated health through lower SES, increased pulmonary disease and smoking rates among both African Americans and whites, or increased prevalence of heart disease and diabetes among whites that were observed in the EHDIC study. Poorer self-rated health in a low-income, urban social context may be associated with stress-related factors that may be more prevalent in this type of social context such as crime, systemic discrimination, food insecurity, housing, and access to resources.

This study is strengthened by the manner in which social context is accounted for, as well as the attempt to account for the multiple covariates included in the analyses. However, some limitations should be noted. EHDIC-SWB was performed in an integrated, urban, low-income, community and these results may not be generalizable to a high-income or rural integrated community. No mental health or psychosocial factors were included in this study. Though EHDIC does include data on depression, anxiety and other psychosocial factors, there are no analogues to these measures in the NHIS 2003. Also, previous studies have included report of difficulty performing activities of daily living (ADLs) as a measure of physical functioning as potential predictors of self-rated health that could not be accounted for in the current study.

In conclusion, this study sought to compare racial disparities in self-rated health, after accounting for social context, to a national dataset. In a low-income, urban, integrated community, there was no race difference in self-rated health, while in NHIS, African Americans had higher odds of reporting fair or poor health. This suggests that social context is more influential than race on ratings of self-rated health when controlling for other determinants. Because self-rated health is such a strong predictor of mortality and morbidity, the results of this study strengthen the literature that finds the importance of social context to racial health disparities.

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