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Cancer Prevention Behaviors in Low-Income Urban Whites: An Understudied Problem

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ABSTRACT *Low-income urban whites in the United States have largely gone unexamined in health disparities research. In this study, we explored cancer prevention behaviors in this population. We compared data on whites with low socioeconomic status (SES) from the 2003 Exploring Health Disparities in Integrated Communities Study in Southwest Baltimore, Maryland (EHDIC-SWB) with nationally representative data for low SES white respondents from the 2003 National Health Interview Survey (NHIS). Rates for health behaviors and health indicators for whites from the EHDIC-SWB study as compared to NHIS prevalence estimates were as follows: current cigarette smoking, 59% (31% nationally); current regular drinking, 5% (5% nationally); overweight, 26% (32% nationally); obesity, 30% (22% nationally); mammography in the past 2 years, 50% (57% nationally); Pap smear in the past 2 years, 64% (68% nationally); screening for colon cancer in the past 2 years, 41% (30% nationally); and fair or poor self-reported health, 37% (22% nationally). Several cancer prevention behaviors and health indicators for white EHDIC-SWB respondents were far from the Healthy People 2010 objectives. This study provides rare estimates of cancer-related health and health care measures in an understudied population in the United States. Findings illustrate the need for further examination of health behaviors in low SES white urban populations who may share health risks with their poor minority urban counterparts.*

KEYWORDS *Urban health, Socioeconomic status, Preventive health, Health disparities, White*

INTRODUCTION

Health disparities based on race/ethnicity and socioeconomic status (SES) have received a great deal of attention in recent years. Most of this research has focused on minority populations, mainly African Americans and Latinos, many of whom live in urban settings in the United States (U.S.). Racial and ethnic disparities have been documented in access and utilization of health services and quality of care, with minority populations faring worse than their white counterparts.[1–6] Research has also identified socioeconomic differences in health outcomes, particularly in chronic diseases, among the young, middle-aged, and disadvantaged segments of society.[7–11]

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Among persons of low SES, rates of participation in screening tests are low, and conversely, practice of unhealthy behaviors is high.[12,13]

A plethora of factors are responsible for SES-based health disparities among populations living in cities, and the challenges affecting urban health continue to mount.[2,5,14] One particular urban population often overlooked in public health research is low-income non-Hispanic whites (hereafter referred to as "whites"). Most U.S.-based studies of social status and health concentrate primarily on minority populations, and while there are more low-income white than black Americans, the health status and health behaviors of low-income whites has not been well characterized.[15,16]

According to Census Bureau estimates, non-Hispanic whites of all income levels represent 50.1% of the population in metropolitan areas inside central cities, 76.0% in metropolitan areas outside central cities, and 82.9% in non-metropolitan areas. The actual count of non-Hispanic whites in metropolitan areas is 149.3 million (40.9 million inside central cities and 108.4 million outside central cities).[17] At the national level, low-income whites are largely concentrated in rural areas, but the number of low-income whites living in urban settings is not inconsequential. Importantly, low-income whites living in high-risk urban areas may share a profile of disadvantage with racial/ethnic minority groups more commonly considered in these environments.

Despite what is known about the benefits of cancer screening and the large improvements in cancer-related risks among some population groups, challenges remain in the case of low-income urban whites, largely due to disparities affecting those who are less educated and living at or below poverty level. Furthermore, screening programs have primarily targeted racial and ethnic minorities because greater proportions of these groups are considered to be disadvantaged. More information is needed to raise awareness about cancer screening and related behaviors among low-income urban whites.

This study provided a unique opportunity to investigate the health behavior patterns associated with modifiable cancer risks among low-income whites living in an urban setting in the U.S. The findings were compared to analogous analyses of nationally representative low-income whites from the National Health Interview Survey (NHIS), which is designed to be proportionately representative of metropolitan and nonmetropolitan residents. Specifically, we examined the frequency of negative health behaviors, cancer screening practices, rates of overweight and obesity, and perceived health status. These results were also compared to the federal Healthy People 2010 objectives for selected topics as a benchmark for needed improvement in this population.[18]

METHODS

Surveys, Design, and Participants

The Exploring Health Disparities in Integrated Communities—Southwest Baltimore study (EHDIC-SWB) was a cross-sectional, face-to-face survey of the adult population (18 years and older) in two contiguous, census tracts in Baltimore, Maryland. Approximately 40% of the adult residents were enrolled in the study (n=1,489). Comparisons to the 2000 Census for the study area indicate that the EHDIC-SWB sample included a lower proportion of men, but was otherwise similar with respect to other demographic and socioeconomic indicators. For instance, the

EHDIC-SWB sample was 43.1% male, whereas the 2000 Census data showed the population in the area was 49.8% male. Age distributions in the EHDIC-SWB sample and 2000 Census data were similar with respect to the median age (35–44 years). The median income for whites in the Census was on the low end of the spectrum ($24,100), and was replicated in EHDIC-SWB ($24,900).

Respondents completed a structured questionnaire, all of which were administered by trained personnel. Health status and health behavior questions were replicated from the 2003 NHIS questionnaire. The EHDIC-SWB study is described in greater detail elsewhere.[19] The study was approved by the Committee on Human Research at the Johns Hopkins Bloomberg School of Public Health, and all participants gave informed consent. For this analysis, we examined the subset of respondents who self-reported as non-Hispanic white ($n=573$).

We compared data on these urban-dwelling, mostly low-income, non-Hispanic white respondents from the EHDIC-SWB study with nationally representative data on low-income non-Hispanic whites interviewed through the NHIS. This enabled us to assess how our sample of urban white Baltimore residents fared regarding various health indicators, compared to all low-income whites across the nation.

The NHIS is an annual, multi-purpose health survey of civilian, non-institutionalized households in the U.S., conducted by the National Center for Health Statistics and the Centers for Disease Control and Prevention.[20] U.S. Census Bureau interviewers administer the survey in respondents' home to adults 17 years and older. Analyses for this particular study were restricted to data from the Sample Adult Core section of the 2003 NHIS because of similarity with the data collected in the EHDIC-SWB survey. The analysis sample was further restricted to poor non-Hispanic white adults 18 years and older. Poor or low SES adults were defined as those with household incomes below 200% of the federal poverty level (FPL). Although the NHIS is designed to produce estimates that are representative of metropolitan and non-metropolitan residents, the 2003 NHIS dataset did not include information on urban/rural location, so we were not able to distinguish urban-dwelling whites in this sample. The final NHIS analysis sample consisted of 5,646 low-income, non-Hispanic white adults. (We also analyzed an NHIS sample of adults who were matched one-to-one on gender, age, race/ethnicity, and poverty level with the EHDIC-SWB sample. The results did not differ significantly from those for the current sample of all low-income adults, and therefore are not presented here.)

Outcome Measures

Health status indicators included self-perceived general health status and weight. Self-rated health status, ranging from excellent to poor, was used as an assessment of overall health and well-being. Body Mass Index (BMI), used as a health indicator for weight, was categorized into underweight (less than 18.5 kg/m^2), normal (18.5–24.9 kg/m^2), overweight (25–29.9 kg/m^2), and obese (30 kg/m^2 or greater). Negative health behavior variables for the analyses included cigarette smoking and alcohol use. Smoking status was categorized as never, former, and current. Alcohol drinking was categorized as lifetime abstainer, former, current infrequent, and current regular.

We also examined preventive health care behaviors, including three cancer screening tests: Pap smears, mammograms, and colorectal cancer screenings. For each of these screening tests, a measure was developed to assess whether each

respondent had received the test within the recommended time period for their age and sex. Guidelines for timely receipt of these screening procedures were derived from Healthy People 2010 objectives and the U.S. Preventive Services Task Force.[18, 21]

The NHIS and EHDIC-SWB samples were compared across age, gender, education attainment, marital status, employment status, poverty level, and health insurance coverage.

Statistical Analyses

Analysis included the generation of means to summarize continuous variables and frequency tabulations to summarize categorical variables. Appropriate standard errors and confidence intervals were generated for each outcome measure. Analysis of the NHIS data employed sampling weights and Taylor series linearization method to account for the complex sample design of the survey. Assuming simple random sampling would produce incorrect variance estimates, so the Taylor series linearization method computes standard errors of point estimates by using appropriate information about the survey strata, primary sampling units, and sampling weights. All analyses were conducted using STATA v.9.[22]

RESULTS

Demographic Characteristics

Table 1 shows the demographic characteristics of the EHDIC-SWB and NHIS samples. A total of 573 non-Hispanic white adults participated in the EHDIC-SWB survey and 5,646 non-Hispanic white adults participated in the 2003 NHIS. Both the Baltimore sample and the national sample had similar proportions of each gender. Almost half of EHDIC-SWB respondents did not complete high school compared with about one quarter of the NHIS sample. Marital statistics were reversed, with one quarter of the EHDIC-SWB sample being married or living with a partner versus half of the NHIS respondents. Slightly fewer participants in the EHDIC-SWB sample were employed compared to NHIS respondents (37.1% vs. 42.9%, respectively). Almost two thirds of EHDIC-SWB respondents were living below 200% of FPL, and 40.1% were uninsured (compared to 22.9% of NHIS respondents who were without health insurance).

Health Status, Health Behavior, and Preventive Health Care

Table 2 shows the various health status, negative health behavior, and preventive health care outcomes for non-Hispanic whites in the EHDIC-SWB sample and the comparison NHIS sample. Approximately 37% of EHDIC-SWB respondents reported their general health status as fair or poor, while only about 22% of NHIS respondents reported fair or poor health status. In contrast, 20% of NHIS participants reported excellent health, compared to only 10% of EHDIC-SWB respondents. Rates of overweight and obesity also differed significantly between EHDIC-SWB and NHIS respondents. Specifically, the rates for overweight were 25.8% for EHDIC-SWB and 31.9% for NHIS respondents; with respect to obesity, the rates were 29.9% for EHDIC-SWB and 21.6% for NHIS respondents.

TABLE 1 Demographic characteristics of non-Hispanic white survey respondents

	EHDIC-SWB ($n=573$)	NHIS ($n=5,646$)
Age, mean (range)	43.89 (18–96)	47.31 (18–85+)
Gender	(%)	% (s.e.)
Male	43.1	42.4 (0.89)
Female	56.9	57.6 (0.89)
Education		
<8th grade	20.4	7.9 (0.51)
Some high school	27.1	16.5 (0.65)
GED/high school graduate	34.2	36.7 (0.89)
Some college	8.6	26.8 (0.87)
College graduate+	9.7	10.4 (0.53)
Missing	–	1.6 (0.24)
Marital status		
Married/living with partner	25.6	49.7 (0.98)
Divorced/separated/widowed	37.1	26.9 (0.75)
Single	37.0	22.7 (1.05)
Missing	0.2	0.65 (0.12)
Employment		
Employed	37.1	42.9 (0.84)
Not employed	49.6	34.0 (0.77)
Retired	13.1	22.2 (0.77)
Missing	0.2	0.83 (0.18)
Poverty		
0–99%	37.9	36.7 (0.96)
100–199%	26.3	63.3 (0.96)
200–299%	15.0	–
300%+	19.8	–
Missing	1.0	–
Health insurance		
Private	22.3	35.1 (1.02)
Government	36.8	41.2 (0.95)
Uninsured	40.1	22.9 (0.80)
Missing	0.7	0.7 (0.14)

Current smoking rates were almost 60% for EHDIC-SWB respondents compared to about 30% for NHIS respondents. The prevalence rates of current regular drinkers and current infrequent drinkers were similar for both EHDIC-SWB and NHIS respondents, about 5% and 45%, respectively. However, EHDIC-SWB respondents were more likely than NHIS respondents to be former drinkers and less likely to be lifetime abstainers.

Cancer screening outcomes included mammography, Pap smear, and colorectal screening by procedure (i.e., colonoscopy, sigmoidoscopy, proctoscopy) or fecal occult blood testing. Rates for receiving a timely mammogram (i.e., in the past 2 years) among women 40 years and over were slightly lower for the EHDIC-SWB sample (50%) than the NHIS sample (57%). Rates of timely Pap smears (i.e., in the past 2 years) among women aged 18 to 65 years were similar across the samples (64% EHDIC-SWB vs. 68%, NHIS). Rates of colon cancer screening in the past 2 years among those 50 years and older were higher for EHDIC-SWB respondents than for NHIS respondents (40.7% vs. 30.4%, respectively).

TABLE 2 Health status, health behavior, and preventive health care

	EHDIC-SWB percent (95% CI) ($n=573$)	2003 NHIS percent (95% CI[a]) ($n=5,646$)	Healthy People 2010 objectives
General health status			
Excellent	10.1 (7.54–12.46)	20.32 (18.95–21.70)	
Very good	17.6 (14.85–21.15)	28.76 (27.35–30.17)	
Good	34.9 (31.09–38.91)	28.79 (27.35–30.23)	
Fair	28.8 (25.28–33.72)	14.76 (13.58–15.94)	
Poor	8.6 (6.66–11.34)	7.37 (6.42–8.31)	
BMI			
Underweight (<18.5)	3.3 (1.60–4.40)	2.67 (2.22–3.12)	
Normal (18.5–24.9)	40.9 (36.97–45.03)	38.65 (37.03–40.27)	
Overweight (25.0–29.9)	25.8 (22.41–29.59)	31.90 (30.41–33.39)	
Obesity (30+)	29.9 (26.25–33.75)	21.63 (20.25–23.01)	15%
Cigarette smoking			
Never	24.8 (21.45–28.55)	47.49 (45.74–49.24)	
Former smoker	16.4 (13.00–19.00)	21.61 (20.39–22.84)	
Current smoker	58.8 (54.97–63.03)	30.89 (29.41–32.38)	12%
Alcohol drinking			
Lifetime abstainer	20.9 (17.66–24.34)	30.10 (28.00–32.19)	
Former drinker	26.2 (22.41–29.59)	18.89 (17.64–20.14)	
Current infrequent	47.6 (43.91–52.09)	45.61 (43.66–47.55)	
Current regular	5.2 (3.22–6.78)	5.40 (4.62–6.19)	
Had mammogram in past 2 years, women 40 years+	50.0 (45.91–54.09)	56.99 (54.31–59.67)	70%
Had Pap smear in past 2 years, women 18–65 years	64.4 (60.07–67.03)	68.10 (65.54–70.65)	90%
Had colorectal cancer screening in past 2 years, 50 years+	40.7 (36.97–45.03)	30.49 (28.29–32.69)	

[a]95% confidence intervals for NHIS sample computed using weights and Taylor linearization methods to account for complex sampling design

DISCUSSION

EHDIC-SWB is the first study to examine health status, health behaviors, and cancer screening among mostly low-income, urban non-Hispanic whites living in a racially integrated neighborhood. The outcome measures examined in this paper indicate that significant health and health care challenges exist for this understudied population.

Overall, the demographic characteristics summarized in Table 1 suggest that, compared to low-income whites nationally, whites living in the urban setting interviewed for the EHDIC-SWB study were at greater social risk for poor health outcomes, as evidenced by lower educational attainment and employment, lower rates of marriage or partnerships, and higher rates of uninsurance. One possible explanation for these differences is that the NHIS covers a wider geographical area, which may capture more socioeconomic diversity than the EHDIC-SWB study catchment area. The EHDIC-SWB census tracts were both located in a resource-poor urban setting, whereas the NHIS data included both urban and rural areas and thus may have masked some of the socioeconomic deprivation occurring in inner cities.

The outcomes presented in Table 2 also indicate that urban, mostly low-income whites in the EHDIC-SWB sample fared worse than low-income whites nationally. Specifically, they had poorer general health status compared to the NHIS respondents, and had higher rates of obesity. BMI was unrelated to age, but was associated with smoking status, with current smokers being more likely to be obese than never or former smokers; gender was also related to BMI, with women being more likely to be obese than men (results not shown). The Healthy People 2010 objective for obesity is targeted at 15% prevalence, but obesity among the EHDIC-SWB sample was twice as high, at almost 30%. The prevalence of current smoking among urban-dwelling whites was almost 60%, twice as high as the nationally representative sample and far exceeding the 12% objective indicated in Healthy People 2010. Urban-dwelling whites were also more likely to be former drinkers and less likely to be lifetime abstainers from alcohol, compared to the nationally representative sample.

With respect to cancer screenings, urban white females had lower rates of timely mammograms (50%) and Pap tests (64%) compared to the national sample of low-income whites (57% and 68%, respectively); furthermore, these rates fell far behind the recommended Healthy People 2010 objectives of 70% adherence for mammograms and 90% adherence for Pap tests. On the other hand, whites from the EHDIC-SWB sample had higher rates of colorectal cancer screening compared to the NHIS sample. There were no gender differences in colorectal screening (results not shown). However, although 40% of EHDIC-SWB respondents received a recent colorectal cancer screening, this was still below the Healthy People 2010 objective of 50% adherence.

The results from our study are consistent with previous findings in the health disparities literature. Although most previous studies have not explicitly focused on urban-dwelling, low-income, non-Hispanic white populations, the accumulation of data from these studies do suggest that this group is uniquely vulnerable in terms of health care and health status. For instance, several studies show a cigarette smoking disparity, with low-income whites displaying worse smoking behaviors (e.g., younger age at initiation, heavier dose and higher frequency, longer duration) than low-income minorities.[24–27] In addition, more urban, low-income white women smoke during pregnancy than their black counterparts.[23, 24] One study reported better smoking outcomes for urban whites compared to urban blacks, but this advantage did not remain statistically significant after controlling for SES.[27] Less is known about alcohol consumption among low-income urban whites. However, one recent study examined alcohol use among white, black, and Hispanic adult participants in the 2005 National Alcohol Survey.[28] Although rural/urban location was not indicated in the analyses, findings suggest that low-income whites have problem drinking behaviors similar to the two minority populations.

With respect to obesity and overweight, previous findings indicate that fewer low-income white women have weight issues than low-income black women.[29] These results come from one study that examined the prevalence of overweight/obesity in a sample of low-income white and black middle-aged women in North Carolina. However, the prevalence of weight problems among low-income white males and the impact for both genders of residing in urban settings still need to be examined.

Results are mixed for mammography use among white women. Several studies indicate that low-income white women are less likely to receive timely mammograms

than low-income black women.[30–32] One study, however, showed no statistically significant racial or ethnic differences in a low-income, urban population.[33]

In the case of Pap testing, the rates of screening for whites appear to be similar to those of black and Hispanic minorities, whether or not adjustments are made for poverty.[32,34–36] One study found that low-income whites fared better than low-income blacks and Hispanics,[37] and one study reported that whites had worse Pap screening outcomes than blacks but it is not clear if the authors adjusted for poverty.[35] However, none of these studies examined the additional dimension of urban setting on Pap test rates in these demographic groups.

Among previous studies on colorectal screening, there were no reports of instances where whites were worse off than minorities. In one urban setting, after adjusting for income and other confounders, whites had higher rates of screening.[38] Studies with mixed urban and rural settings showed that whites had similar or higher rates of participation in colorectal screening compared to minorities.[36,39–41]

This study builds on the sparse body of literature pertaining to low-income urban non-Hispanic whites, by providing the first detailed estimates of cancer-related health behaviors and preventive health care measures for this understudied group. Our findings thus begin to shed light on this vulnerable population and point to the need for additional research and public health programming. Further research is warranted to better understand and address the health needs of poor urban whites.

The urban white sample from the EDHIC-SWB study in general was in worse health, engaged in more unhealthy behaviors, and reported lower use of cancer screening procedures than the national sample of low-income whites, which included both urban and rural residents; however, low-income whites from the NHIS sample in general did not come close to meeting the Healthy People 2010 objectives either. This suggests that these health behavior and health care problems, while possibly worse in urban areas, are not limited to the Baltimore sample of mostly low-income whites.

These results suggest that in order to successfully address health disparities, public health interventions may need to target other risk factors besides minority race/ethnicity, including residence in inner cities and low SES. A coordinated strategy is needed to guide efforts aimed at reducing health disparities in southwest Baltimore and throughout the nation where all forms of inequalities still persist. Cessation and prevention activities focused on alcohol, tobacco, and obesity must be initiated, continued, or reinvigorated in urban settings, which are comprised primarily of low-income residents and include both white and minority populations. Cancer awareness and education is also necessary to promote regular screening and early detection and treatment.

Study Strengths and Limitations

The primary strengths of this study are that it provides rare estimates of health behaviors and health care utilization among low-income urban whites, and raises awareness about a previously understudied population that may go largely unnoticed in efforts to reduce health disparities. Both the EHDIC-SWB and NHIS sample populations provide strong evidence of poor health status, negative health behaviors, and poor preventive health care among lower SES whites.

The limitations include self-report of measures, cross-sectional design, and limited generalizability of the results from the EHDIC-SWB study. We were also unable to determine whether NHIS respondents lived in urban or rural areas

because this variable was not included in the public use file. Therefore, it is not known to what extent NHIS respondents were from urban communities. However, previous Census research indicates that about 80% of the U.S. population resides in metropolitan areas.[42] As NHIS is designed to be nationally representative of the U.S. population, it can be inferred that the same proportion of NHIS respondents are urban dwellers as the general population. This suggests that the proportion of non-urban respondents in NHIS is relatively small. Nonetheless, other demographic characteristics prevail in drawing conclusions about the study population of low-income whites in the U.S.

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