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ABSTRACT

Objective: To examine the relationship between race and smoking behaviors among Latinos/Hispanics.

Design: Using data from the National Adult Tobacco Survey (NATS), we implemented Log-Poisson regression models for each dependent variable (smoking pattern and menthol cigarette use). Each analysis adjusted for age, gender, marital status, employment status, and socioeconomic status (SES). Final pooled cross-sectional sample included 505 Black-Latinos and 9078 White-Latinos.

Results: While no racial differences were found in lifetime smoking status among Latinos, Black-Latinos had a 16.6% (95% CI: 0.274, 0.057) increased risk of menthol smoking compared to White-Latinos.

Conclusions: The results indicate that menthol consumption is influenced by race among Hispanics/Latinos. To comprehensively address racial disparities among Latinos/Hispanics, further attention needs to be given to racial differences in smoking-related risks among Latinos/Hispanics.

Introduction

Non-Hispanic Blacks (or African Americans) experience a disproportionate burden of smoking-related diseases, such as higher incidence of lung cancer and cardiovascular disease compared to their White counterparts, despite having lower smoking prevalence (Tibuakuu et al. 2017; Williams et al. 2012). Non-Hispanic Blacks also are less likely to experience successful smoking cessation compared to non-Hispanic Whites, placing them at an increased risk for disease (Kulak et al. 2016). In contrast, Latinos/Hispanics have lower rates of smoking, but do not experience successful smoking cessation compared to non-Hispanic Whites (Trinidad et al. 2011). As the Latino population rapidly increases, in the U.S., however, smoking will become a larger public health concern for this underserved population, resulting from multiple dynamics; such as poor access to health care and cessation resources (Zinser, Pampel, and Flores 2011; Levinson et al. 2004).

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When considering specific-tobacco products among smokers, non-Hispanic Blacks and Hispanic/Latinos are more likely to consume menthol cigarettes, a product associated with decreased smoking cessation(Smith, Fiore, and Baker 2014; Gandhi et al. 2009; Villanti et al. 2016). The active compounds in menthol are known to damage or kill cells and produce worse cardiovascular effects as compared to nonmenthol cigarettes (Hoffman 2011). National data from 2004 to 2014 show that menthol cigarette use has increased in general, although overall smoking prevalence has declined; yet Latinos have demonstrated the largest rate increase in menthol cigarette smoking over this time period (Villanti et al. 2016). It is unclear what might be driving this increase in menthol cigarette consumption among Latinos. Some public health researchers have begun to assess racial variations, as one potential aspect of the sociodemographic heterogeneity among Latino populations, to better understand this largest growing ethnic minority group in the U.S. (Cuevas, Dawson, and Williams 2016; LaVeist-Ramos et al. 2012). Garcia's (2017) recent meta-analysis assessing the deployment of race in studies archived via the University of Michigan's Inter-University Consortium for Political & Social research, provides an exhaustive conceptualization of race. This conceptualization is inclusive of eight components (2017):

> (a) race is a social construct hinged on social and political contexts rather than essential biological group differences (Smedley and Smedley 2012); (b) individuals have considerable agency in placing themselves within racial categories (i.e. racial self-identification) (López et al. 2017; Jones et al. 2008); (c) racial self-identification is a cognitive dimension of one's self-concept and is a development process (Vargas et al. 2016); (d) racial self-identification is heavily influenced by external social dynamics (i.e. legal status and constraints, historical contexts, etc.) (Vargas et al. 2016; Valdez and Golash-Boza 2017); (e) racial self-identification is dynamic and can change across the life-course (Saperstein and Penner 2014; Saperstein and Penner 2012); (f) racial identification is one element in a multitude of social identities that operate synergistically (Bratter and O'Connell 2017; Bratter and Gorman 2011); (g) racial classification is historically understood via hierarchal classifications based on phenotype characteristics (Perreira and Telles 2014; Telles 2014); and (h) race is separate, but related, to ethnicity (i.e. cultural similarities) which can serve as intersectional concepts or perhaps interchangeable concepts (Garcia 2017, 4).

Markus (2008) conceptualizes ethnicity as a dynamic set of historically derived and institutionalized ideas and practices that:

> (a) allows people to identify or to be identified with groupings of people on the basis of presumed (and usually claimed) commonalities including language, history, nation or region of origin, customs, ways of being, religion, names, physical appearances, and/or genealogy or ancestry; (b) can be a source of meaning, action, and identity; and (c) confers a sense of belonging, pride, and motivation. (654)

Debates are vast, and consensus very little, in terms of how best to define, operationalize, and subsequently measure the Latino (or Hispanic) population in the U.S., particularly measurement of race (Rodriguez 2000; Arias, Heron, and Hakes 2016; Mora 2014; Perreira and Telles 2014). Furthermore, we recognize that some studies deploy the term 'Hispanic' to refer to Spanish-speaking individuals with origins in Latin American and/or the Caribbean; while some studies deploy the term Latino. The two terms are often used interchangeably. Nevertheless, it is recognized that 'Hispanic' is a narrower term that only refers to persons of Spanish-speaking origin or ancestry, while 'Latino' is more used to

refer generally to anyone of Latin American origin or ancestry, including Brazilians. In this paper, we operationalize Latinos as individuals persons of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish-speaking origin or ancestry (Flores et al. 2002; Arias 2010; Arias, Heron, and Hakes 2016; Wallman, Evinger, and Schechter 2000; Perez and Hirschman 2009). For the current study, we utilize the term Black Latinos to denote individuals who ethnically identified as Latino (or Hispanic) and racially identify as Black or African-American.

Despite the evidence of racial/ethnic disparities in smoking patterns and behaviors, much of this literature has glossed over the importance of race among Latinos. Latinos who racially identify as Black have been rapidly increasing in the U.S., with the population of Black-Latinos more than doubling between 2000 and 2010 (Therrien and Ramirez 2000; Humes, Jones, and Ramirez 2011). Of the roughly 50.5 million American residents identifying as Hispanic/Latino (16% of the general population), roughly 2.5% identified as Afro-Latinos ($\approx$ 1,261,939 persons) (Humes, Jones, and Ramirez 2011). A recent review revealed that health differences between Black-Latinos and White-Latinos in the United States closely resembles that of non-Hispanic Blacks and non-Hispanic Whites (Cuevas, Dawson, and Williams 2016). Black-Latinos tend to share many similar sociodemographic characteristics of non-Hispanic Blacks, such as having disproportionately low-income (Gradín 2012), experiencing high rates of poverty (Hamilton 2014), and living in highly segregated Black neighborhoods (Logan 2003), all of which may influence the racial health gap among Latinos. Nevertheless, there is a paucity of research identifying the factors contributing to these racial health differences among this group. One important area in which racial differences in health behaviors has been overlooked is tobacco and smoking-related research. Among the very few studies that have evaluated racial differences in smoking behaviors among Latinos, LaVeist-Ramos et al. (2012) found that Black Latinos (21.9%) exhibited a higher prevalence of current smoking status compared to both White Latinos (19.1%) and non-Hispanic Blacks (20.2%).

Recognizing that Latinos are experiencing increased rates of menthol cigarette smoking, and racial differences among Latinos indicate that Black-Latinos are at increased risk of cigarette smoking in general compared to their White Latino counterparts, research is needed to assess whether racial differences in menthol cigarette consumption exist among Latinos, both for lifetime and current smoking status. The current study examined the relationship between race and smoking behaviors among Latinos, with a particular focus on menthol cigarette consumption. We include non-Hispanic Blacks and non-Hispanic Whites in the study to contextualize findings within the broader literature. Based on the literature described above, the current study had the following study hypotheses: (1) non-Hispanic Blacks and Black-Latinos will have a lower prevalence of smoking compared to their non-Hispanic White counterparts, whereas no statistically significant differences will be observed between White-Latinos and non-Hispanic Whites; (2) non-Hispanic Blacks and Black-Latinos will have a higher prevalence of menthol consumption compared to non-Hispanic Whites, wherein no statistically significant differences will be observed between White-Latinos and non-Hispanic Whites; and (3) Black Latino will exhibit a lower prevalence of smoking compared to their White Latino counterparts, yet a higher prevalence of menthol cigarette consumption compared to their White Latino counterparts.

Methods

The National Adult Tobacco Survey (NATS) is a stratified, national landline and cellular telephone survey of non-institutionalized adults aged 18 years and older residing in all 50 states in the United States, as well as the District of Columbia. The 2012–2013 ($n =$ 60,197) and 2013–2014 ($n =$ 75,233) cross-sectional datasets were pooled to increase the possibility of identifying a large enough sample of Black-Latinos. Both samples were designed to yield representative national and state data from households. The questionnaires from the datasets consist of a series of questions pertaining to general health, smoking behaviors, cigarette smoking, other tobacco use, and respondent sociodemographic characteristics. Broken down by telephone type by year: 45,022 (landline phones) and 15,170 (cellular phones) in the 2012–2013 administration and 52,594 (landline phones) and 22,639 (cellular phones) in the 2013–2014 administration. More detailed description about the survey methodology can be found elsewhere (Hu 2016). From a total of 135,430 observations across both waves, the current investigation utilized an analytic sample of $N =$ 102,292, for all observations with complete information on measures described below.

Measurements

Four dependent outcomes were assessed in the current study respectively: (a) lifetime cigarette smoking status; (b) recent menthol cigarette smoking; (c) current cigarette smoking status; and d) current menthol cigarette smoking status Lifetime cigarette smoking status was assessed by the following question: 'Have you smoked 100 cigarettes in your lifetime?' (Yes/No). Status of recent menthol cigarette smoking was assessed with the following question: 'Have you smoked menthol cigarettes in the past six months or more?' (Yes/No). To capture current cigarette smoking status, we utilized the following question: 'Do you now smoke cigarettes?' For assessing current menthol consumption status, we utilized the following question: 'Currently, when you smoke cigarettes, how often do you smoke menthol cigarettes?'. Response options were: (a) All of the Time, (b) Most of the Time, (c) Some of the time, (d) Rarely, and (e) Never. We dichotomized this measure into yes/no, wherein those identifying anything other than never were marked as current menthol consumption. Although LaVeist-Ramos et al. (2012) identified that Black Latinos were at increased risk for current smoking status, this study did not evaluate both current/lifetime cigarette smoking status, nor did the study evaluate menthol cigarette consumption.

Black-Latinos ($n =$ 505) were persons who considered themselves to be ethnically Hispanic/Latino and reported only Black/African-American as their race. To obtain this specification, two questions were utilized: (a) 'Are you Hispanic, Latino or of Spanish origin?' and (b) 'Are you Black or African American?' White Latinos were persons who reported only White as their race and Hispanic/Latino ethnicity ($n =$ 9078). Latinos providing another racial identification were dropped from the current analyses ($n =$ 905); following previous research in this area. Using the same prompts above, the current investigation included $n =$ 100, 684 non-Hispanic Whites, $n =$ 10,568 non-Hispanic Blacks, and $n =$ 3448 Asian Americans. All other respondents were grouped as 'Other' ($n =$ 7082), including those identifying as American Indian/Alaskan Native and/or Native Hawaiian/Pacific Islander. Since our interest is in assessing racial differences among Latinos, we exclude

presentation of point estimates Asian Americans and those in the 'Other' categories in regression models.

We adjusted for several covariates known to be associated with cigarette and/or menthol cigarette smoking more specifically. These included sex at birth, educational attainment, age, annual household income, marital status, and employment status (King, Dube, and Tynan 2012). Lastly, a variable indicating the year in which the respondent completed the survey interview was included to minimize impact of secular trends.

Data analysis

We conducted descriptive statistical analyses for selected measures. We used Log-Poisson regression models in which results were exponentiated to relative risk ratios, with corresponding 95% confidence intervals and *p*-values. Three sets of regression models were utilized for each dependent variable: (1) baseline model age-adjusted; (2) the addition of covariates without socioeconomic status (SES) measures (educational attainment and income); and lastly (3) the addition of covariates with SES measures. These models were replicated for both lifetime smoking history, recent menthol cigarette consumption, current cigarette smoking status, and current menthol cigarette consumption and then stratified by gender. Prior research indicates that gender is a strong predictor of menthol consumption (Okuyemi et al. 2007; Cubbin, Soobader, and LeClere 2010); therefore, supporting stratifying our analyses by gender, which was also supported by an interaction test (not presented). Stata 13.0 was utilized for all analyses in which we employed Stata's GLM package (for the binomial family with robust standard error estimates) for all Log-Poisson regression models. All regression analyses were weighted using national weights provided within the datasets respectively, following guidelines for handling weights when pooling cross-sectional data across multiple years.

To aid interpretation of increases or decreases in the probability of recent and current menthol cigarette use among racial/ethnic groups, average marginal effects (AME) were calculated using Stata's *mchange* command suite (Long 2014; Park 2015). Using changes in analysis estimates allowed us to assess differences between groups (Onukwugha, Bergtold, and Jain 2015), when comparing to non-Hispanic Whites. This approach allowed us to more specifically assess racial differences among Latinos by providing estimates directly evaluating differences in menthol cigarette consumption between the two groups, rather than models only comparing each group respectively to non-Hispanic Whites. Although we provide AME estimates solely for menthol cigarette usage, estimates for general cigarette usage can be supplied upon request.

Results

Sample descriptive characteristics

As indicated from our descriptive analysis (Table 1), Non-Hispanic Whites exhibited the oldest mean age ($\approx$ 49), while Black-Latinos exhibited the youngest mean age ($\approx$ 35). White-Latinos exhibited a higher percentage of those having less than a high school degree compared to Black-Latinos (34.50% vs. 27.99%). Black-Latinos were less likely to be married (25.70%), in comparison to both non-Hispanic Blacks (30.26%) and White-

Table 1. Select demographics by race/ethnicity: national adult tobacco survey (2012–2014).

	Non-Hispanic White	Non-Hispanic Black	Black-Latino	White Latino	Asian American	Other
Age, y (mean)	49.08	44.53	35.69	39.39	37.80	43.12
Sex at Birth, %						
Male	48.10	45.52	54.82	48.66	51.39	51.38
Female	51.89	54.47	45.17	51.33	48.60	48.61
Education, %						
Less than high school diploma	8.50	17.27	27.99	33.50	4.39	15.47
High School Diploma, GED or equivalent	28.41	31.04	29.88	27.07	15.05	28.02
Some college, or less than Bachelor's Degree	32.26	33.05	28.60	25.78	20.87	37.85
Bachelor's Degree	18.69	12.34	9.58	9.05	31.80	11.82
Master's, professional or Doctorate	12.11	6.27	3.93	4.58	27.87	6.81
Annual Household Income, %						
<$20,000	9.33	19.26	19.98	21.29	6.29	16.04
$20,000 to <$30,000	8.50	12.43	13.17	15.43	5.56	12.63
$30,000 to <$40,000	9.82	14.86	16.12	14.63	8.08	11.25
$40,000 to <$50,000	11.79	13.73	14.76	13.16	10.22	12.19
$50,000 to <$70,000	16.54	16.18	13.69	13.09	15.46	15.66
$70,000 to <$100,000	18.21	11.86	9.91	10.63	18.38	14.67
$100,000 to <$150,000	14.83	6.92	4.93	6.96	17.54	10.38
$150,000 +	10.95	4.73	7.38	4.77	18.42	7.14
Marital Status						
Married	55.15	30.26	25.70	43.70	53.77	39.00
Cohabitating	6.66	8.14	11.71	13.18	5.38	11.72
Divorced	10.40	11.77	6.84	7.32	3.71	10.98
idowed	8.04	7.33	2.31	3.40	1.77	6.37
Separated	1.69	4.85	6.16	5.23	1.62	3.56
Single, never married	18.03	37.61	47.26	27.14	33.72	28.27
Employment Status						
Yes	59.17	59.67	61.01	61.94	71.16	58.43
No	40.82	40.32	38.98	38.05	28.83	41.56
Language of Interview						
Yes	99.84	99.82	77.72	63.66	99.92	99.85
No	0.15	0.17	22.27	36.33	0.07	0.15

Latinos (43.70%) respectively. Black-Latinos were also more likely to conduct the interview in English (77.72%) compared to their White-Latino counterparts (63.66%).

Lifetime cigarette use & recent menthol cigarette use

Table 2 provides the regression models for the entire sample and we focus on reporting significant differences, paying close attention to differences between non-Hispanic Blacks, Black Latinos and White Latinos. First, we provide estimates Assessing lifetime cigarette smoking status and recent menthol cigarette consumption, in age-adjusted only models (Model 1), non-Hispanic Blacks (aRR = 0.95; 95% CI = 0.94, 0.96), Black-Latinos (aRR = 0.90; 95% CI = 0.86, 0.94), and White-Latinos (aRR = 0.90; 95% CI = 0.89, 0.91) were all at decreased risk of lifetime cigarette smoking history compared to their non-Hispanic White counterparts. When adjusting for sex, age, marital status, employment status, and SES, this patterns persisted (Model 2–3).

Now we turn attention to recent menthol cigarette consumption (Table 2, Models 4–6). In age-adjusted only models, non-Hispanic Blacks (aRR = 1.30; 95% CI = 1.29, 1.32) and Black-Latinos (aRR = 1.16; 95% CI = 1.09, 1.23) were at an increased risk of recent menthol

Table 2. Adjusted relative risks (RRs) and 95% CI for lifetime smoking history & menthol cigarette consumption ($N = 102,292$): NATS, (2012–2014).

	Lifetime Cigarette Smoking History			Recent Menthol Cigarette Consumption		
	Model 1: Age-Adjusted (aRRs) [95% CI]	Model 2[a]: Martial Status & Language of Interview Adjusted (aRRs) [95% CI]	Model 3[b]: Fully Adjusted (aRRs) [95% CI]	Model 4: Age-Adjusted (aRRs) [95% CI]	Model 5[a]: Martial Status & Language of Interview Adjusted (aRRs) [95% CI]	Model 6[b]: Fully Adjusted (aRRs) [95% CI]
Race/Ethnicity						
Non-Hispanic White (ref)	1.00	1.00	1.00	1.00	1.00	1.00
Non-Hispanic Black	0.95*** [0.94–0.96]	0.95*** [0.94–0.96]	0.92*** [0.92–0.94]	1.30*** [1.29–1.32]	1.29*** [1.28–1.30]	1.29*** [1.27–1.30]
Black Latino	0.90*** [0.86–0.94]	0.93*** [0.90–0.97]	0.92*** [0.88–0.96]	1.16*** [1.09–1.23]	1.20*** [1.13–1.27]	1.16*** [1.09–1.24]
White Latino	0.90*** [0.89–0.91]	0.94*** [0.93–0.95]	0.92*** [0.91–0.93]	1.02 [0.99–1.03]	1.06*** [1.04–1.08]	1.04*** [1.02–1.07]
Other	1.04*** [1.03–1.05]	1.05*** [1.03–1.06]	1.03*** [1.02–1.04]	1.08*** [1.06–1.10]	1.07*** [1.05–1.09]	1.06*** [1.04–1.08]
	Current Cigarette Smoking Status			Current Menthol Consumption		
Race/Ethnicity						
Non-Hispanic White (ref)	1.00	1.00	1.00	1.00	1.00	1.00
Non-Hispanic Black	1.15*** [1.12–1.18]	1.20*** [1.17–1.23]	1.20*** [1.18–1.23]	1.85*** [1.79–1.92]	1.81*** [1.75–1.88]	1.77*** [1.71–1.84]
Black Latino	1.18*** [1.07–1.30]	1.16** [1.05–1.28]	1.17** [1.06–1.29]	1.44*** [1.20–1.74]	1.42*** [1.17–1.71]	1.39*** [1.16–1.68]
White Latino	1.10*** [1.07–1.13]	1.01 [0.98–1.04]	1.01 [0.98–1.05]	1.22*** [1.14–1.31]	1.22*** [1.14–1.32]	1.21*** [1.12–1.30]
Other	1.06** [1.02–1.11]	1.07*** [1.03–1.12]	1.03 [0.99–1.08]	1.43*** [1.28–1.60]	1.43*** [1.28–1.60]	1.48*** [1.33–1.65]

Note: CI = confidence interval; aRR = Adjusted Risk Ratios.
[a]Model 2 includes: Age (y), Marital Status & Language of Interview as covariates, adjusting for their influence.
[b]Model 3 includes: Age (y), Marital Status, Language of Interview, Educational Attainment, & Income as covariates, adjusting for their influence.
***$p < 0.001$, **$p < 0.01$, *$p < 0.05$.

consumption compared to non-Hispanic Whites. In the fully adjusted model (Model 6), non-Hispanic Blacks (aRR = 1.29; 95% CI = 1.27, 1.30), Black-Latinos (aRR = 1.16; 95% CI = 1.09, 1.24) and White-Latinos (aRR = 1.04; 95% CI = 1.02, 1.07) all exhibited an increased risk of recent menthol cigarettes consumption compared to their non-Hispanic White counterparts.

Current cigarette use & current menthol cigarette use

Table 2 also provides estimates assessing racial differences in both current cigarette use and current menthol cigarette use. In the fully adjusted model assessing current cigarette use (Model 3), non-Hispanic Blacks (aRR = 1.20; 95% CI = 1.17, 1.23) and Black Latinos (aRR = 1.16; 95% CI = 1.06, 1.29) exhibited an increased risk of current cigarette use compared to their non-Hispanic White counterparts. When evaluating current menthol cigarette use, in the fully adjusted model (Model 6), non-Hispanic Blacks (aRR = 1.77; 95% CI = 1.71, 1.84), Black Latinos (aRR = 1.39; 95% CI = 1.16, 1.68), and White Latinos (aRR = 1.21; 95% CI = 1.12, 1.30) exhibited an increased risk of current menthol consumption, compared to their non-Hispanic White counterparts.

Gender differences in lifetime cigarette use & recent menthol consumption

Now we turn attention to estimates supplied in Table 3, gender-stratified models, where we focus first on men. Among men respondents, non-Hispanic Black (aRR = 0.94; 95% CI = 0.93, 0.96), Black Latino (aRR = 0.91; 95% CI = 0.86, 0.97), and White Latino men (aRR = 0.94; 95% CI = 0.93, 0.96) exhibited a decreased risk of lifetime cigarette smoking history, compared to their non-Hispanic White counterparts in the fully adjusted model (Model 3). In models assessing recent menthol cigarette consumption, non-Hispanic Black (aRR = 1.31; 95% CI = 1.29, 1.33), Black Latino (aRR = 1.23; 95% CI = 1.13, 1.33), and White Latino men (aRR = 1.03; 95% CI = 1.00, 1.06) exhibited an increased risk of recent menthol cigarette consumption compared to their non-Hispanic White counterparts in the fully adjusted model.

Next, we discuss findings assessing racial differences in both lifetime cigarette use and recent menthol cigarette consumption among women (Table 3). In fully adjusted models assessing lifetime cigarette use, non-Hispanic Black women (aRR = 0.91; 95% CI = 0.89, 0.92), Black Latina (aRR = 0.92; 95% CI = 0.87, 0.98), and White Latina (aRR = 0.90; 95% CI = 0.88, 0.91) women exhibited a decreased risk of lifetime cigarette use compared to their non-Hispanic White women counterparts. In the fully adjusted model assessing recent menthol cigarette consumption, non-Hispanic Black (aRR = 1.26; 95% CI = 1.24, 1.28) and White Latina (aRR = 1.06; 95% CI = 1.03, 1.10) women exhibited an increased risk of recent menthol cigarette consumption compared to their non-Hispanic White women counterparts.

Gender differences in current cigarette use & current menthol consumption

Table 3 also provides estimates for gender-stratified models assessing current cigarette use and current menthol consumption. In the fully adjusted model assessing current cigarette use among men, non-Hispanic Black (aRR = 1.21; 95% CI = 1.17, 1.25) and Black Latino (aRR = 1.20; 95% CI = 1.04, 1.39) men exhibited an increased risk of current cigarette use compared to their non-Hispanic White men counterparts. In the fully adjusted model assessing current

Table 3. Adjusted relative risks (RRs) and 95% CI for lifetime smoking history & menthol cigarette consumption (*N* = 102,292): NATS, (2012–2014) [Gendered Stratified Models].

	Lifetime Smoking History			Menthol Cigarette Consumption		
	Model 1: Unadjusted Lifetime Smoking History (RRs)	Model 2[a]: Adjusted Lifetime Smoking History [W/O SES Measures] (aRRs)	Model 3[b]: Fully Adjusted Lifetime Smoking History (aRRs)	Model 1: Unadjusted Menthol Smoking History (RRs)	Model 2[a]: Adjusted Menthol Smoking History [W/O SES Measures] (aRRs)	Model 3[b]: Fully Adjusted Menthol Smoking History (aRRs)
Men Only Models						
Race/Ethnicity						
Non-Hispanic White (ref)	1.00	1.00	1.00	1.00	1.00	1.00
Non-Hispanic Black	0.97*** [0.96–0.98]	0.97*** [0.96–0.99]	0.94*** [0.93–0.96]	1.33*** [1.31–1.35]	1.31*** [1.29–1.33]	1.31*** [1.29–1.33]
Black Latino	0.89*** [0.84–0.95]	0.93** [0.88–0.98]	0.91** [0.86–0.97]	1.19*** [1.10–1.29]	1.24*** [1.17–1.33]	1.23*** [1.13–1.33]
White Latino	0.94*** [0.93–0.95]	0.97*** [0.95–0.98]	0.94*** [0.93–0.96]	1.00 [0.98–1.03]	1.05*** [1.02–1.07]	1.03* [1.00–1.06]
Women Only Models						
Race/Ethnicity						
Non-Hispanic White (ref)	1.00	1.00	1.00	1.00	1.00	1.00
Non-Hispanic Black	0.93*** [0.92–0.94]	0.93*** [0.92–0.94]	0.91*** [0.89–0.92]	1.28*** [1.26–1.30]	1.26*** [1.24–1.28]	1.26*** [1.24–1.28]
Black Latino	0.90*** [0.85–0.95]	0.94* [0.89–0.99]	0.92** [0.87–0.98]	1.12* [1.02–1.23]	1.13* [1.03–1.24]	1.07 [0.97–1.18]
White Latino	0.86*** [0.85–0.87]	0.92*** [0.90–0.93]	0.90*** [0.88–0.91]	1.05*** [1.03–1.08]	1.07*** [1.04–1.10]	1.06*** [1.03–1.10]
	Current Cigarette Smoking Status			Current Menthol Consumption		
Men Only Models						
Race/Ethnicity						
Non-Hispanic White (ref)	1.00	1.00	1.00	1.00	1.00	1.00
Non-Hispanic Black	1.16*** [1.12–1.20]	1.19*** [1.15–1.24]	1.21*** [1.17–1.25]	1.75*** [1.67–1.84]	1.77*** [1.67–1.86]	1.74*** [1.65–1.84]
Black Latino	1.21** [1.06–1.40]	1.19* [1.03–1.37]	1.20* [1.04–1.39]	1.43*** [1.13–1.83]	1.28 [0.99–1.67]	1.26 [0.97–1.64]
White Latino	1.05* [1.01–1.10]	0.98 [0.93–1.03]	0.99 [0.94–1.04]	1.23*** [1.12–1.34]	1.16** [1.05–1.28]	1.15** [1.04–1.27]
Women Only Models						
Race/Ethnicity						
Non-Hispanic White (ref)	1.00	1.00	1.00	1.00	1.00	1.00
Non-Hispanic Black	1.14*** [1.11–1.17]	1.22*** [1.19–1.26]	1.22*** [1.19–1.26]	1.92*** [1.82–2.02]	1.84*** [1.74–1.94]	1.81*** [1.71–1.91]
Black Latino	1.13 [0.99–1.29]	1.14* [1.01–1.30]	1.14* [1.01–1.30]	1.75*** [1.45–2.11]	1.61*** [1.30–1.99]	1.63*** [1.31–2.04]
White Latino	1.14*** [1.11–1.18]	1.03 [0.99–1.08]	1.04 [0.99–1.08]	1.43*** [1.29–1.59]	1.30*** [1.18–1.45]	1.31*** [1.18–1.46]

Note: CI = confidence interval; RR = Risk Ratios; aRR = Adjusted Risk Ratios
[a]Model 2 includes: Age (y), Marital Status & Language of Interview as covariates, adjusting for their influence.
[b]Model 3 includes: Age (y), Marital Status, Language of Interview, Educational Attainment, & Income as covariates, adjusting for their influence.
***$p < 0.001$, **$p < 0.01$, *$p < 0.05$.

menthol cigarette consumption, non-Hispanic Black men (aRR = 1.74; 95% CI = 1.65, 1.84) and White Latino men (aRR = 1.15; 95% CI = 1.04, 1.33) exhibited an increased risk of current cigarette consumption compared to their non-Hispanic White men counterparts.

Now we turn attention to models focusing on women and current cigarette use and current menthol consumption. In the fully adjusted model assessing current cigarette use among women, non-Hispanic Black women (aRR = 1.22; 95% CI = 1.19, 1.26) and Black Latina (aRR = 1.14; 95% CI = 1.01, 1.30) women exhibited an increased risk of current cigarette smoking status, compared to their non-Hispanic White women counterparts. In the fully adjusted model assessing current menthol consumption among women, non-Hispanic Black women (aRR = 1.81; 95% CI = 1.71, 1.91), Black Latina (aRR = 1.63; 95% CI = 1.31, 2.04) and White Latina (aRR = 1.31; 95% CI = 1.18, 1.46) women exhibited an increased risk of current menthol consumption, compared to their non-Hispanic White women counterparts.

Marginal effects estimates

Although the above estimates provided are useful in understanding racial differences in smoking behaviors among Latino populations, the above estimates do not specifically provide estimates of the racial differences among Latinos when comparing them to their non-Hispanic White counterparts. Therefore, we conducted marginal effects, which supplies us with a point estimate in the differences between particular racial/ethnic groups, based on the point estimates derived in the above regression models (see Table 4). Black-Latinos had a 22.9% (95%CI: 0.122, 0.335) higher level of menthol smoking compared to their non-Hispanic White counterparts. White-Latinos, on the other hand, had a 6.3% (95% CI: 0.033, 0.093) elevated level of menthol smoking compared to their non-Hispanic White counterparts. Non-Hispanic Blacks had the highest risk of smoking menthol compared to all groups. When directly comparing Black-Latinos to White-Latinos, White-Latinos had 16.6% (95% CI: −0.274, −0.057) decrease risk in menthol smoking compared to their Black-Latino counterparts.

In gender stratified fully-adjusted models, Black-Latino men exhibited a 32% (95% CI: 0.186, 0.455) increased risk in menthol smoking compared to non-Hispanic White men and a 27.7% (95% CI: 0.415, 0.140) increased risk compared to White-Latino men. While non-Hispanic Black men had higher risk of smoking menthol compared to non-Hispanic White men and White-Latino men, no significant difference was found between non-Hispanic Black men and Black-Latino men. Among women, White-Latinas exhibited a 9.2% (95% CI: 0.046, 0.138) increase in menthol cigarette smoking compared to non-Hispanic White women. In comparing White-Latinas to Black-Latinas, there was no statistically significant difference in menthol consumption. Non-Hispanic Black women had the highest risk of smoking menthol compared to the other groups.

Discussion

We assessed racial/ethnic differences in smoking patterns and behaviors, with a focus on racial differences among Latino populations specifically. To our knowledge, this is the first study to estimate differences in both lifetime/recent and current cigarette use and menthol consumption patterns, focusing on racial differences among Latino populations, using a nationally representative sample. Our analyses provide evidence that race/ethnicity

Table 4. Marginal effect (average) estimates for changes between racial/ethnic groups in menthol cigarette usage.

	Standard Error	Change Δ in Marginal Effects	Lower CI	Upper CI	p-value
All					
Race/Ethnicity Group Comparisons					
Black vs. White	0.010	0.396	0.376	0.415	0.000
Black-Latino vs. White	0.054	0.229	0.122	0.335	0.000
White-Latino vs. White	0.015	0.063	0.033	0.093	0.000
Black-Latino vs. Black	0.055	−0.167	−0.274	−0.060	0.002
White-Latino vs. Black	0.017	−0.333	−0.367	−0.299	0.000
White-Latino vs. Black-Latino	0.055	−0.166	−0.274	−0.057	0.003
Men					
Black vs. White	0.014	0.417	0.389	0.446	0.000
Black-Latino vs. White	0.069	0.320	0.186	0.455	0.000
White-Latino vs. White	0.020	0.043	0.004	0.083	0.032
Black-Latino vs. Black	0.070	−0.097	−0.233	0.039	0.163
White-Latino vs. Black	0.024	−0.330	−0.420	−0.328	0.000
White-Latino vs. Black-Latino	0.070	−0.277	−0.415	−0.140	0.000
Women					
Black vs. White	0.014	0.369	0.342	0.397	0.000
Black-Latino vs. White	0.078	0.106	−0.048	0.259	0.178
White-Latino vs. White	0.023	0.092	0.046	0.138	0.000
Black-Latino vs. Black	0.079	−0.264	−0.418	−0.109	0.001
White-Latino vs. Black	0.026	−0.277	−0.328	−0.226	0.000
White-Latino vs. Black-Latino	0.081	−0.014	−0.172	0.144	0.865

influences smoking behaviors, even among subgroups within the Latino population. Black-Latinos, White-Latinos, and non-Hispanic Blacks were less likely to report lifetime smoking history compared to their White counterparts; which is supported by LaVeist-Ramos et al's previous study (2012) Furthermore, we find that Black-Latinos performed more like non-Hispanic Blacks than their White-Latino counterparts with regards to menthol cigarette consumption; both recent and current menthol consumption. Black-Latinos had a higher risk of smoking menthol cigarettes compared to non-Hispanic Whites and White-Latinos. These relationships also held in gender-stratified models, confirming all of the current investigations' hypotheses.

While these findings are extremely useful in documenting racial differences in smoking behaviors among Latinos, the underlying causes for these racial differences among Latinos are still unknown. However, a recent review finds that Black-Latinos tend to have high rates of poverty and live in highly segregated Black neighborhoods (Cuevas, Dawson, and Williams 2016), which may expose them to more menthol cigarette marketing and greater access to menthol cigarettes (Waddell et al. 2016). Furthermore, recent research has highlighted that neighborhoods with younger adults in New York, experienced higher menthol cigarette point-of-sale marketing (Waddell et al. 2016), which could also influence uptake of menthol cigarette consumption. Future research should investigate the potential social and structural influences that contribute to these existing racial differences in menthol cigarette use, particularly assessing contextual dynamics embedded within neighborhoods.

Health researchers have increasingly highlighted the need for intersectional analyses to uncover similarities and differences among various groups with multiple intersecting social identities (Williams et al. 2012; Jackson, Williams, and VanderWeele 2016; Garnett et al. 2014; Viruell-Fuentes, Miranda, and Abdulrahim 2012). Collins and Bilge (2016) operationalize intersectionality as a way of understanding and analyzing

complexity in the world, among people and across human experiences to illuminate how social identities are informed by a multitude of various systems of oppression; whereby social identities are shaped by many factors in diverse and mutually reinforcing ways, providing a useful analytic tool. For example, Wallman, Evinger, and Schechter (2000) highlighted the need for research seeking to understand the confounding between race/ethnicity and SES factors; particularly as it relates to tobacco-related behaviors and lung cancer. Thus, we explored the influence of gender in shaping the potential for different smoking-related behaviors. In gender stratified models, Black-Latino men had similar smoking statuses compared to White-Latino men, yet they were significantly more likely to consume menthol cigarettes compared to White-Latino men and non-Hispanic White men. The results endured after adjusting for SES. The persistent association between race and menthol consumption after controlling for SES suggests that other unmeasured explanatory factors may play a significant role in menthol smoking disparities among the men. Different patterns emerged for women in our study. Afro-Latina smokers were at an increased risk of smoking menthol compared to their non-Hispanic White-counterparts. These findings suggest that SES contributes significantly to variation in racial smoking patterns among Latina women.

Limitations

The current investigation included several limitations that warrant attention. The present study was cross-sectional in nature, precluding assumptions of temporal associations or causality. However, the strengths of our study should also be considered. The aggregation of two waves of NATS data generated a large sample of Black-Latinos, which allowed for comparison with White-Latinos as well as adjustment for multiple potential confounders. Future research should address other aspects of risk, such as intensity of use, quit attempts, maintenance of abstinence, and susceptibility to smoking, which were not measured in the current study (Salloum et al. 2016; El-Toukhy, Sabado, and Choi 2016; Kendzor et al. 2014; Reitzel et al. 2011; Keeler et al. 2016; Bandiera et al. 2016). Previous studies suggest that Blacks may smoke menthol cigarettes as a way of cope with stressors, such as discrimination, and seek social support from other menthol cigarette smokers (Castro 2004; Gardiner 2001). Because experiences of discrimination and other stressors may be more common among Black-Latinos compared to their White counterparts (Araujo and Borrell 2016; Cuevas, Dawson, and Williams 2016), Black-Latinos, may engage in menthol cigarette smoking to cope with such stressors. More studies are needed to examine the roles that psychosocial stress and neighborhood factors play in racial disparities among Latinos, with respect to smoking-related behaviors. Another limitation of the current study is that we were not able to assess further differences among Latinos, using the racial classification of Black and White, in terms of ethnic variation. Additional evidence would allow us to provide a high impact approach to prevention efforts, particularly for Black-Latinos.

Conclusion

Emerging epidemiological research suggests that race has a significant influence on Latino health and well-being (Borrell 2005). Authors have found that Black Latinos (referred to as

Hispanic Blacks in the study) have a higher prevalence of self-reported hypertension than White-Latinos (referred to as Hispanic Whites) (Borrell 2006). Other studies have found that Black Latinos have greater odds of reporting fair/poor self-rated health than White-Latino/as (Borrell and Dallo 2008; Borrell and Crawford 2006), have a greater body mass index (Kershaw and Albrecht 2014), and higher levels of depressive symptoms compared to their White counterparts (Ramos, Jaccard, and Guilamo-Ramos 2003). The causes for these racial disparities remain unclear. However, Borrell (2005) suggests that Latinos who identify as Black may experience a wide range of social, situational, and structural disadvantages that negatively affect their health. She posits inequities of social goods and resources are filtered through individual (e.g. income), psychosocial (e.g. interpersonal discrimination), and contextual levels (e.g. segregation) to affect health and health behaviors. Overall, the results of our analysis indicate that menthol cigarette consumption is influenced by race among Latinos. Racial difference in menthol cigarette consumption may be indicative of racial inequities in one or all of the levels suggested by Borrell (i.e. individual-, interpersonal-, contextual-level). Further research is needed to identify the individual, psychosocial, and environmental characteristics that help explain racial difference in menthol consumption among Latinos.

Efforts to reduce the use of menthol consumption should consider race within the Latino population as Black-Latinos may bear a greater burden of tobacco risks. This requires a thoughtful approach to prevention measures for Black-Latinos. While Black-Latinos may share many similar features to non-Hispanic Blacks, they may have different sociocultural influences that impede the effectiveness of interventions. This is especially important when considering menthol consumption, an important contributor to poor cessation outcomes for non-White smokers (Keeler et al. 2016). Developing effective smoking cessation programs might well require considerable attention to social norms for smoking menthol cigarettes among these groups, particularly Black-Latinos.

LaVeist and colleagues suggest that health behavior interventions that are tailored to the various Latino cultures may effectively reach Black-Latinos. Given that Black-Latinos are more likely to live in high non-Hispanic Black segregation areas, these interventions may not fully reach them. Furthermore, Black-Latinos may experience more institutional and interpersonal discrimination than their White counterparts (Borrell and Dallo 2008; Perreira and Telles 2014). Because of these complexities, Black-Latinos may require uniquely tailored attention in public health interventions and policy development.

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