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Ethnic differences in smoking rate, nicotine dependence, and cessation-related variables among adult smokers in Hawaii

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Abstract

This study tests hypotheses concerning ethnic disparities in daily cigarette smoking rates, nicotine dependence, cessation motivation, and knowledge and past use of cessation methods (e.g., counseling) and products (e.g., nicotine patch) in a multiethnic sample of smokers in Hawaii. Previous research has revealed significant differences in smoking prevalence among Native Hawaiians, Filipinos, Japanese, and Caucasians in Hawaii. However, no study has examined differences in dependence and cessation-related knowledge and practices among smokers representing these ethnic groups. Participants were recruited through newspaper advertisement as part of a larger smoking cessation intervention study. Participants ($N=919$; $M\text{ age}=45.6$, $SD=12.7$; 48% Women) eligible to participate provided self-report data through mail and telephone. Participants included 271 self-identified Native Hawaiians, 63 Filipinos, 316 Caucasians, 145 “East Asians” (e.g., Japanese, Chinese), and 124 “Other” (e.g., Hispanic, African-American). Pair-wise comparisons of means, controlling for age, gender, income, education, and marital status, indicated that Native Hawaiian smokers reported significantly higher daily smoking rates and higher levels of nicotine dependence compared to East Asians. Native Hawaiian smokers reported significantly lower motivation to quit smoking than Caucasians. Further, Filipino and Native Hawaiian smokers reported lesser knowledge of cessation methods and products, and less frequent use of these methods and products than Caucasians. The results suggest that Native Hawaiian and Filipino smokers could be underserved with regard to receiving cessation-related advice, and may lack adequate access to smoking cessation products and services. In addition, cessation interventions tailored for Native Hawaiian smokers could benefit from a motivational enhancement component.

Introduction

Tobacco smoking is a leading cause of morbidity and mortality in the United States and is the leading preventable cause of cancer (United States Department of Health and Human Services, 2004). The damaging effects of tobacco impact all ethnic groups and both genders. However, some minority groups are affected disproportionately along various aspects of the tobacco disease continuum (Fagan, Moolchan, Lawrence, Fernander, & Ponder, 2007). Recent research has focused on potential mechanisms for reducing and eliminating tobacco-related health disparities, and most of this research has focused on comparisons among African-Americans, Hispanics, and Caucasians. Asian/Pacific Islanders (A/PIs) represent another important racial/ethnic demographic group in the United States, currently comprising 4.4% of the population (i.e., 13.5 million) and expected to double by 2050 (U.S.

Census Bureau, 2000). Compared to other major ethnic/racial categories, A/PIs have been understudied with regard to tobacco-related health disparities research.

Although smoking prevalence among A/PIs is low in aggregate nationally (Kim, Ziedonis, & Chen, 2007), data from Hawaii indicate that considerable differences in smoking prevalence exist among East Asian (e.g., Japanese, Chinese, Korean), Filipino, and Native Hawaiian subgroups (Hong, 2002; Kaholokula, Braun, Kana'iaupuni, Gardinetti, & Chang, 2006; Maskarinec et al., 2005). Among individuals 18 years and older in Hawaii, 24.3% of Native Hawaiians report being current smokers, compared with 16.4% of Filipinos, 13.6% of Japanese, and 15.4% of Caucasians (HCFF, 2010). Native Hawaiians, in addition to having a relatively high rate of smoking prevalence, also are at greater risk for developing lung cancer compared to other ethnic groups, even after adjusting for other lung cancer risk factors (Kolonel et al., 2000; Haiman et al., 2006). In general studies suggest that Native Hawaiians (and African Americans) metabolize nicotine at greater rates than other groups, and that Japanese metabolize nicotine at lesser rates, though results vary slightly among the various analyses. These metabolic differences could account for some tobacco-related health disparities (such as lung cancer risk), though other societal influences also are likely involved.

Filipinos are relatively understudied in smoking-related epidemiological and psychosocial research compared to other major A/PI subgroups. Filipinos represent a socially disadvantaged group in Hawaii and are second most at risk for smoking, and for lung cancer incidence and mortality (HCFF, 2010). The first Filipino immigrants came to Hawaii in the early 1900s to work in farms as manual laborers and Filipinos currently represent the most recent major immigrant group in Hawaii (Teodoro, 1981). Thus, Filipinos in Hawaii have a history of lower socioeconomic status (SES). Also, Filipinos have had a shorter time period to acculturate to the US culture as compared to other ethnic groups in Hawaii.

Research on ethnic differences on nicotine dependence usually has treated A/PI as an aggregate group, and typically compared this aggregate group to Caucasians (e.g., Goodwin, Keyes, & Hasin, 2009; Hu, Davies, & Kandel, 2006). Further, most studies have focused on differences in rates of nicotine metabolism, and deduced higher levels of dependence from these higher rates of nicotine metabolism (see Kim, Ziedonis, & Chen, 2007). Self-report measures of nicotine dependence such as the Fagerstrom Test of Nicotine Dependence (FTND; Heatherton, Kozlowski, Frecker & Fagerstrom, 1991) rarely have been employed. Other important variables seldom studied among A/PI include motivation to quit smoking, knowledge about smoking cessation products and methods, and use of smoking cessation products and methods. The current study evaluates these key cessation-related variables among samples of Native Hawaiian, Filipino, East Asian, and Caucasian smokers in Hawaii while controlling for potential confounders such as age, gender, marital status, income, and education.

The ultimate objective of this research is to better understand smoking prevalence disparities among major ethnic groups in Hawaii. Better understanding of both psychological and behavioral aspects of smoking and smoking cessation among Hawaii's diverse populations will foster development of smoking cessation programs targeted to the needs of the various populations. Ultimately, these efforts could ameliorate disparities in tobacco-related health disparities among the ethnic groups.

Hypotheses

Based upon previous research (Le Marchand, Wilkens, & Kolonel, 1992; Maskarinec et al. 2005; Kaholokula et al., 2006; Haiman et al., 2006; HCFF, 2010), we hypothesize that Native Hawaiians will have a higher mean smoking rate (cigarettes per day), and thus higher

levels of nicotine dependence compared to the other major ethnic groups in Hawaii. Given that nicotine dependence and motivation to quit are negatively correlated (Abrams, Herzog, Emmons, & Linnan, 2000; West, 2004), we further predict that Native Hawaiians will evince lower levels of motivation to quit smoking, as compared to the other groups in Hawaii. All hypotheses will be tested while controlling for age, gender, income, education, and marital status. We also hypothesize that Filipinos will be intermediate regarding smoking rate, nicotine dependence, motivation to quit, compared to the other ethnic groups. East Asians (Chinese, Japanese, and Korean) and Caucasians are hypothesized to be least in smoking rates and nicotine dependence, and highest in terms of motivation to quit, again controlling for demographic variables. Finally, we will include an ethnic category “Other.” This category comprises all ethnicities whose numbers were too small to justify a separate category for analysis (e.g., African-American, Samoan, Tongan, Vietnamese, etc.) No hypotheses were made for comparisons involving the “Other” category. Further, hypotheses regarding ethnic differences in knowledge and past use of cessation products and methods are not justified on the basis of available data and or theoretical rationale. Analyses of these two outcome variables will be considered to be exploratory.

Methods

Data collection procedure

The current set of analyses employed a baseline dataset from a large randomized smoking cessation trial in Hawaii. Participants were recruited using newspaper advertisements. Eligible participants: (a) were 18 years or older, (b) read English, (c) had mailing addresses, and (d) were self-identified as smokers of at least three cigarettes per day (mean) and at least 100 cigarettes in their lifetimes. In addition, smokers who met all three of the following criteria were not eligible to participate: (a) had a quit attempt lasting 24-hours or longer within the past year, (b) were planning to quit smoking in the next 30 days, and (c) were trying to quit “right now.” This set of exclusion criteria were employed for theoretical reasons specific to the randomized intervention trial.

The current research followed the human subject protection protocol approved by the University of Hawaii at Manoa Institution Review Board. Potential participants were screened for eligibility requirements over the telephone. Participants were mailed baseline questionnaires along with stamped and addressed return envelopes. Upon receipt of completed questionnaires, participants were mailed \$25 gift cards. Participants had the opportunity to complete three surveys (baseline and two follow-ups) as part of the randomized trial. However, the current study pertains only to the baseline surveys.

Measures

Demographics—Demographic variables included participants’ age, gender, income, education, marital status, and ethnicity. To determine annual household income, participants were asked “What is the approximate total yearly income of your household?” Eleven response options were provided ranging from (1) “\$10,000 or less” to (11) “Over \$100,000.” Education was determined in terms of highest level of schooling completed. Participants chose from a list ranging from (1) 8th grade or less to (8) Post-graduate degree. Marital status was determined based on the question, “What is your current marital status?” (Married or living as married, Widowed, Divorced, Separated, or Never married). For analysis purposes, the marital status variable was dichotomized as “Currently married or living as married” or “currently single,” which was an aggregate of the “Widowed,” “Divorced,” “Separated,” and “Never married” response options.

Participants' ethnicity was based upon responses to the survey item: "Please select the one ethnic group with which you most strongly identify." The list of response options included Chinese, Filipino, Hawaiian/Part Hawaiian, Japanese, Korean, White or Caucasian, African American, and Other. The "Other" option included a space to write in one's ethnicity. Because small numbers of Chinese (N=23) and Koreans (N=11) were represented in the current sample, we combined these two groups with Japanese (N=111) to form one category called "East Asian." Current as well as previous data suggest that these subgroups in Hawaii are similar in terms of smoking rates and SES (e.g., Glanz, Maskarinec, & Carlin, 2005). In the current sample, participants identifying themselves with ethnicities other than East Asian, Hawaiian/Part Hawaiian, Filipino, or White or Caucasian, were classified as "Other." The "Other" category was comprised mainly of African-American, Hispanic, Native American, and Pacific Islander (e.g., Samoan, Chuukese, Tongan) smokers. For the purposes of the current analyses, it was necessary to employ ethnic groups of sufficient sample size as to make statistical calculations meaningful. Hence, these "Other" groups were combined to form one aggregate category.

Mean Daily Smoking Rate—Participants were asked to report the average number of cigarettes per day smoked. This was an open-ended question assessed during the telephone screening process.

Nicotine Dependence—The Fagerstrom Test of Nicotine Dependence (FTND; Heatherton, Kozlowski, Frecker & Fagerstrom, 1991) was employed. This instrument has been used extensively in research during the past 20 years.

Motivation to Quit Smoking—There currently is no consensus regarding how best to assess motivation to quit among smokers (Herzog & Blagg, 2007). For this reason, we developed our own 5-item measurement tool. The 5 items measure smokers' motivation to quit smoking in terms of the strength of intentions (e.g., "Do you intend to quit smoking?"; "Do you intend to cut down on the number of cigarettes you smoke?"); and planning (e.g., "Do you have a plan for how to quit smoking?"). Each of the 5 items is measured on a five-point scale ranging from 1 ("No definitely not") to 5 ("Yes definitely"). These items were employed in previous research that compared the stage of change to a variety of alternative measures of motivation to quit smoking (Herzog & Blagg, 2007). Psychometric analyses based on the present data indicated that the 5 items load on a single factor (Eigenvalue=3.15) with factor-loadings greater than 0.70 and show high internal consistency (Cronbach's alpha= 0.85). Hence, the "motivation to quit" scale was created by summing up the 5 items. The scale was distributed normally in the entire sample as well as within each of the 5 ethnic groups (skewness ranged from -0.35 to -0.56 across ethnic groups).

Knowledge and Past Use of Cessation Tools/Methods—Participants' knowledge of 12 different smoking cessation products and methods were assessed. Participants were asked: "How knowledgeable are you about the following products and services?" The list that followed included: Nicotine gum, Nicotine patch, Nicotine lozenge, Nicotine nasal spray, Nicotine inhaler, Zyban (Bupropion Hydrochloride), Chantix (Varenicline), Quitting cold-turkey, Group program to quit smoking, Individual counseling/therapy, Tobacco quit line, and Internet quit smoking program. For each product or method, there were four response options, ranging from "Not at all knowledgeable" (scored as 0) to "Very knowledgeable" (scored as 3). The same list of 12 smoking cessation products and methods was used to assess the extent of the participants' past use of cessation products or methods. The question was phrased: "Have you ever used these products or methods in past attempts to quit smoking?" For each cessation product or method, four response options ranged from

“No, never” (scored as 0) to “Yes, 4 or more times” (scored as 3). Indices of knowledge and past use were created by summing responses across the 12 products/methods.

Data Analysis

Data were analyzed using SAS (Version 9.1). Means or proportions for key study variables were calculated across the following 5 ethnic categories: Native Hawaiian, Filipino, East Asian, Caucasian, and Other. Analysis of Covariance (ANCOVA) was conducted using the PROC GLM procedure to test the study hypotheses. The means pertaining to following four dependent variables were compared across the 5 ethnic groups: mean daily smoking rate (i.e., cigarettes per day), nicotine dependence, motivation to quit, knowledge of cessation products and methods, and past use of cessation products and methods. Covariates included in the regression models were: age, gender, income, education, and marital status. Multiple comparisons among means were conducted using Tukey’s Studentized Range (HSD) test ($\alpha=0.05$; 2-tailed), which controls for the Type I experiment-wise error rate.

Results

Participant Characteristics

A total of 919 participants were included in the analyses. Table 1 contains the demographic characteristics of the sample by ethnicity. For the entire sample, the mean age of participants was 45.6 years old ($SD=12.7$) and 48% of the participants were women. Forty-five percent of participants had a high school level of education or less; 31% were employed, with the remaining participants being unemployed (36%), retired (8%), or disabled (25%). Nineteen percent were married or living as married; the remainder being never married (43%), separated (6%), divorced (28%), or widowed (4%). The median income was between \$10,001 and \$20,000. Participants smoked at a mean rate of 19.3 cigarettes per day ($SD=12.2$).

Main Results

Daily Smoking Rate—The leftmost column of Table 2 displays the mean cigarettes per day for the five ethnic categories. ANCOVA analysis indicated that the main effect of ethnicity was marginally statistically significant, $F(4, 884) = 1.92, p = .10$. Consistent with hypotheses, Native Hawaiians reported the highest mean daily smoking rate compared with other four ethnic categories. Pairwise comparisons of means among ethnic groups indicated that the difference in mean smoking rate was statistically significant between Native Hawaiians and East Asians ($p < .05$). Regression results also indicated that being woman ($B = -3.25, SE = 0.81; p < 0.0001$) and higher education ($B = -2.36, SE = 0.55; p < 0.0001$) were significantly related to lower daily smoking rate.

Nicotine Dependence—The main effect of ethnicity on nicotine dependence was marginally significant, $F(4, 884) = 1.93, p < .10$. Native Hawaiians reported the highest level of nicotine dependence; this was consistent with hypotheses. Pairwise comparisons of means again revealed a statistically significant difference between Native Hawaiians and East Asians ($p < .05$). Among the covariates considered, being woman ($B = -0.55, SE = 0.16; p < 0.001$), higher income ($B = -0.10; SE = 0.04; p = 0.02$), and higher education ($B = -0.48, SE = 0.11; p < 0.0001$) were related to lower nicotine dependence.

Motivation to Quit Smoking—The main effect of ethnicity on motivation to quit smoking was statistically significant, $F(4, 884) = 3.01, p = 0.01$. Overall, Native Hawaiians reported the lowest motivation to quit smoking; again consistent with predictions. A significant pairwise effect was observed for Native Hawaiian and Caucasian participants. Specifically, Caucasians evinced a greater mean motivation to quit as compared to Native

Hawaiians ($p < .05$). Other pairwise comparisons were not statistically significant. None of the covariates were significantly related with motivation to quit smoking.

Knowledge of Cessation Products and Methods—A highly significant main effect of ethnicity was observed, $F(4,884) = 9.93, p < .0001$. In addition, a pairwise effect was obtained for Caucasians paired with Native Hawaiians, Filipinos, and East Asians, respectively (all p s $< .05$). To be specific, Caucasian smokers indicated that they had a greater knowledge and familiarity with smoking cessation products and methods than did members of the other three groups. No significant pairwise differences were observed among the non-Caucasian ethnic groups. Women ($B = 1.51; SE = 0.48; p = 0.002$), those with higher levels of education ($B = 1.64, SE = 0.32; p < 0.0001$), and those married/living as married ($B = 1.32, SE = 0.64; p = 0.04$) were more likely to be knowledgeable about cessation products and/or methods.

Past Use of Cessation Products and Methods—A statistically significant main effect of ethnicity was detected, $F(4, 884) = 4.27, p = .002$. Pairwise significant differences between Native Hawaiians and Caucasians and Filipinos and Caucasians were revealed (p s $< .05$). Filipinos employed smoking cessation products and methods least frequently, followed by Native Hawaiians; whereas Caucasians employed these products and methods most frequently. All other pairwise comparisons did not reach statistical significance. Those with higher levels of education ($B = 0.38, SE = 0.14; p = 0.01$) and those married/living as married ($B = 0.78; SE = 0.28; p = 0.007$) were more likely to have used cessation products and/or methods in the past.

Discussion

Research in Hawaii consistently has revealed high prevalence of smoking among Native Hawaiians and Filipinos (e.g., Maskarinec et al., 2005; HCFF, 2010). However, few publications have described ethnic disparities in psychosocial and cessation-related variables with regard to subgroups of A/PI smokers. The current results reveal that Native Hawaiians experience disparities not just for prevalence of smoking but also for daily smoking rate, nicotine dependence, and the crucial cessation-related variables of motivation to quit smoking and knowledge and practice regarding cessation products and methods. These results suggest that it may be possible to reduce smoking prevalence among Native Hawaiians by increasing motivation to quit and by providing Native Hawaiians with information and access to a broad array of smoking cessation products, methods, and services.

The reasons for the reported disparities cannot be ascertained based on the variables examined in the current set of analyses. Research has demonstrated that Native Hawaiian and Filipino communities in Hawaii experience greater poverty and unemployment, in addition to lesser educational attainment and less favorable health outcomes, compared to East Asians and Caucasians (Kuramoto & Nakashima, 2000). The current analyses controlled for some of these potentially confounding socioeconomic factors, and ethnic disparities persisted, suggesting that factors beyond SES may be influencing the ethnic differences. However, it should be noted that the socio-economic indicators used in the current study (i.e., income, education, and occupational status) have their limitations. For example, similar level of educational attainment may not mean similar quality of education across ethnic groups and current income or employment status is unlikely to reflect the extent of lifetime earning or personal wealth (Wikleby & Cubbin, 2004). In addition, researchers have argued that SES, which is a complex, multidimensional variable, cannot be adequately measured using a small set of indicators: thus, it is reasonable to assume some residual confounding due to SES in ethnic differences in our dependent variables (Wikleby

& Cubbin, 2004). However, to consider that socio-economic factors solely explain ethnic disparities in health risk behavior, including smoking, would be unreasonable as well (Crimmins, Hayward, & Seeman, 2004).

As mentioned previously, differences in metabolism of nicotine (e.g., Derby et al., 2008) also could contribute to the observed disparities in smoking rate, nicotine dependence, and cessation motivation. Future research needs to examine differential exposure to stress (e.g., life events, perceived discrimination) as a determinant of ethnic differences in smoking-related variables. The research linking higher stress exposure to greater likelihood of being a smoker and higher smoking rate has been extensive [see Kassel, Paronis, & Stround (2003) for review]. The stress-coping model of smoking (Wills & Shiffman, 1985) has postulated that smoking provides a means to cope with stress or to alleviate distress by providing positive or negative reinforcement. Thus, one may argue that smokers from ethnic groups that are exposed to higher levels of stress are more likely to show higher smoking rates or nicotine dependence. Given their unique social, cultural, and historical background, Native Hawaiians and Filipinos are more prone to experiencing lifetime as well as day-to-day stressful events (McCubbin, Ishikawa, & McCubbin, 2008; Teodoro, 1981). In addition, recent research has shown that Native Hawaiians and Filipinos in Hawaii are likely to report high levels of stressful experiences such as racial discrimination (Kaholokula et al., 2011; Gee, Delva, & Takeuchi, 2007).

In our sample, Filipinos and Native Hawaiians scored low on knowledge and practice related to cessation tools/methods. This may indicate that information regarding cessation-related products or methods or the potential benefits of using such products/methods may not be reaching the Filipino and Native Hawaiian smokers. It is also possible that higher levels of nicotine dependence contribute to a lesser motivation to quit smoking, which in turn results in a lowered interest in smoking cessation products and methods. Mediation analyses could be helpful to test this, and other, theoretical possibilities. Clearly, more research is needed to understand the predictors of cessation-related knowledge and practice among these groups.

Limitations

Although the current study is novel in several respects, limitations exist. The current sample is not a scientifically representative sample of smokers in Hawaii. Instead, smokers were recruited primarily using newspaper advertisements (i.e., a self-selected sample). The ethnic distribution smokers in our sample was similar to that of the Hawaiian population (HCFF, 2010), though Filipino smokers were somewhat underrepresented. Further, the current sample was disproportionately low in SES. Although smokers are generally low in SES in the general population (CDC, 2004), the current sample was lower in SES compared to smokers generally. Another caveat to note is that the current sample excluded smokers who met all of the following three criteria: (a) had a quit attempt lasting 24-hours or longer within the past year, (b) were planning to quit smoking in the next 30 days, and (c) were trying to quit “right now.” This could have introduced bias into the analyses by excluding smokers who might have shown greater knowledge regarding cessation products and methods. The ethnic categorizations employed in the current research were not ideal. However, the ethnic complexities of the population of Hawaii required some degree of improvisation to achieve adequate sample sizes (such as the decision to form “East Asian” and an “Other” categories).

Conclusions

The current study analyzed ethnic differences in several smoking-related variables among smokers in Hawaii. The unique ethnic composition of Hawaii facilitates the inclusion of

several understudied American minority groups. Previous research has established that Native Hawaiians have a greater prevalence of cigarette smoking compared to other groups in Hawaii. The current results reveal that Native Hawaiian smokers face additional barriers to quitting in the form of lower motivation to quit, higher nicotine dependence, lesser knowledge of cessation products and methods, and lesser experience with cessation products and methods, as compared to smokers of other ethnicities. Filipino smokers appear to face some of the same obstacles to cessation success. These disparities persisted after controlling for potential confounds such as age, gender, income, education, and marital status. These results suggest that Native Hawaiians and Filipinos could benefit from a broad range of culturally sensitive intervention strategies, including motivation enhancement and greater utilization of a range of smoking cessation products and methods.

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Table 1

Participants demographic characteristics (N=919)

		Native Hawaiian	Filipino	Asian	White	Other
N		271	63	145	316	124
Mean Age (SD)		42.2 (11.2)	40.9 (14.2)	47.1 (12.7)	49.2 (12.8)	44.3 (12.0)
Female (%)		58	62	39	46	39
Employment						
	Employed (%)	28	31	36	32	27
	Unemployed (%)	45	44	35	28	35
	Retired (%)	3	10	9	13	6
	Disabled (%)	24	15	20	27	32
Annual income						
	\$10,000 or less (%)	55	43	30	37	49
	\$10,001–\$20,000 (%)	15	20	24	21	22
	\$20,001–\$30,000 (%)	11	16	15	14	7
	\$30,001–\$60,000 (%)	14	11	20	19	15
	> \$60,000 (%)	5	10	11	9	8
Education						
	< 12 th grade (%)	17	14	4	7	7
	12 th grade/GED (%)	43	38	40	26	32
	Some college (%)	39	44	43	53	53
	Bachelor's (%)	1	3	13	14	8
Marital status						
	Married/living as married (%)	23	18	19	17	18
	Widowed (%)	2	5	3	6	3
	Divorced (%)	23	16	24	33	35
	Separated (%)	7	5	6	6	9
	Never married (%)	45	57	49	38	35

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Table 2

Results for ANCOVA and multiple comparison procedure testing ethnic differences in daily smoking rate, nicotine dependence, cessation motivation, and knowledge and past use of cessation tools/methods.

	Daily smoking rate ¹	Nicotine dependence ²	Motivation to quit ³	Knowledge of cessation tools/methods ⁴	Past use of cessation tools/methods ⁵
Native Hawaiian (N=271)	21.34 (15.43)a	5.58 (2.32)a	14.78 (5.34)a	5.25 (6.54)a	2.01 (2.94)a
Filipino (N=63)	17.83 (10.67)ab	4.89 (2.32)ab	15.89 (4.96)ab	5.82 (6.59)a	1.95 (2.12)a
Asian (N=145)	17.39 (8.95)b	4.85 (2.41)b	15.59 (4.99)ab	7.18 (7.59)ac	2.44 (2.94)ab
White (N=316)	18.90 (9.56)ab	5.24 (2.40)ab	16.45 (4.93)b	9.56 (7.23)b	3.17 (2.95)b
Other (N=124)	18.91 (13.64)ab	5.40 (2.50)ab	15.39 (5.14)ab	7.97 (7.96)bc	2.77 (3.77)ab
Model F (DF)	5.19 (884)	6.47 (884)	2.15 (881)	13.25 (875)	4.56 (879)
Model <i>p</i> -value	P<0.0001	P<0.0001	P=0.02	P<0.0001	P<0.0001

Note.

- ¹Range=3–60,
- ²Range=0–10,
- ³Range=5–25,
- ⁴Range=0–36,
- ⁵Range=0–30.

ANCOVA controlled for age, gender, annual income, education, and marital status. Same-letter subscript across a dependent variable column indicates no statistically significant difference between means at alpha=0.05 [multiple comparison procedure conducted using Tukey’s Studentized Range (HSD) test, which controls the Type I experiment-wise error rate].