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Racial/Ethnic Variations in Clustered Risk Behaviors in the U.S.

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Abstract

Introduction: Alcohol misuse, cigarette smoking, poor diet, and physical inactivity, known as the “big four” contributors to chronic conditions and mortality, typically co-occur or cluster together, with their synergistic effect more detrimental to health than their cumulative individual effects. Little research has been reported on race/ethnicity-specific analyses of the clustering of these behaviors in the U.S. This study identified clustered risk behaviors among whites, blacks, and Hispanics and examined whether unhealthy clusters were associated with lower SES (assessed by education level and family income) and poor health status.

Methods: A nationally representative sample of U.S. adults aged 30–69 years (N=9,761) from the 2010 and 2015 National Alcohol Surveys was used to perform latent class analysis and multinomial and logistic regression modeling in 2018–2019. Obesity was used as a proxy for unhealthy diet.

Results: Three lifestyle classes were identified in each group. The “relatively healthy lifestyle” class was identified among whites and Hispanics. The “non-smoking and low risky drinking” class among blacks, though showing a healthier lifestyle than the other two classes, still had relatively high prevalence of inactivity and obesity. The “inactive and obese” class was found in all three groups. Also identified were the “smoking and risky drinking” class among whites, the “smoking and inactive” class among blacks, and the “smoking, inactive, and risky drinking” class among Hispanics. For all three groups, unhealthy lifestyle classes mostly were associated with lower SES. Unhealthy lifestyle classes were also associated with poorer health status.

Conclusions: Multi-behavior interventions are warranted to address inactivity and obesity in all three groups and unhealthy clusters involving smoking in each group.

INTRODUCTION

Known as the “big four” contributors to mortality,¹ alcohol misuse, cigarette smoking, poor diet, and physical inactivity are the leading proximal and modifiable causes of morbidity and premature mortality.^{2–5} In 2000, these four risk factors accounted for 39% of the total

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annual deaths in the U.S.² These behaviors typically co-occur or cluster together, with their synergistic effect more detrimental to health than their cumulative individual effects.⁶

To date, analyses of co-occurrence of these behaviors (engagement in two or more health-related behaviors) among U.S. adults has mostly used counts of risk behaviors,⁷ showing high prevalence of multiple health risk behaviors⁴ associated with chronic conditions and poorer health status.⁸ An examination of clustering (where risk behavior combination is more prevalent than expected on the basis of prevalence of individual behaviors)⁶ using advanced techniques such as latent class analysis (LCA) and cluster analysis has distinct advantages over co-occurrence analyses, including the ability to identify underlying patterns of clustering.⁷ Although a small number of studies examined clustering of a wider range of health risk factors (e.g., a combination of chronic conditions and health behaviors among primary care patients⁹ and various risk behaviors including sexual risk taking and drinking and driving among college students),¹⁰ few studies have examined clustering of the “big four” behaviors among U.S. adults. Furthermore, no research, to the authors’ knowledge, has been reported on how clustered risk behaviors vary across racial/ethnic groups. European studies of clustered risk behaviors have used predominantly white, general population samples,^{11,12} with little understanding of how these behaviors occur in racial minorities.

Health behaviors are not simply a matter of individual choices. They are influenced by the social, cultural, and economic circumstances that frame and constrain them,^{13,14} which may significantly vary across diverse racial/ethnic groups. Racial disparities in health have been well noted, with blacks, in particular, having poorer health than whites across a broad range of outcomes.¹⁵ As health behaviors might constitute important pathways that lead to disparities in chronic health conditions,¹⁶ the lack of knowledge of clustered health behaviors specific to each racial/ethnic group hampers development of contextually relevant interventions, tailored to each group, that can critically improve their health. To address this gap and inform future targeted interventions, this study aims to identify common or diverging patterns of clustered risk behaviors among three major racial/ethnic groups in the U.S.

The current study also examines associations of clustered risk behaviors with SES and health status within each racial/ethnic group. Past research using predominantly white samples has found unhealthy behaviors more prevalent among low-SES individuals than higher-SES individuals.^{5,6,11,12} However, this relationship may not hold for racial/ethnic minorities. There is strong evidence of racial inequities in the quality of schooling and associated opportunities such as earnings or occupational achievements^{17–19} and social and physical environments with different levels of risk exposures and quality of care.²⁰ These inequities may diminish the returns of socioeconomic advantage on health for racial minorities, especially blacks.^{16,21,22} In examining the associations of clustered risk behaviors with SES and health status that may vary across racial/ethnic groups, the applicability of the diminishing returns thesis to clustered risk behaviors is evaluated for the first time, in an effort to help elucidate a key mechanism (one that involves unhealthy lifestyles) that may lead to racial disparities in health.

The current study is limited to adults aged 30–69 because of age-related lifestyle patterns. Heavy drinking peaks in young adulthood and declines in later adulthood^{23,24} largely because of the waning influence of heavy-drinking peers and increasing adult responsibilities.^{25,26} Older adults may also reduce dietary intake,²⁷ quit smoking or drinking out of health concerns,^{28,29} and reduce participation in physical activities owing to age-related functional declines.^{30,31}

METHODS

Study Sample

A nationally representative sample of U.S. adults aged 30–69 years (N=9,761) from the 2010 and 2015 National Alcohol Survey (NAS) was used. Blacks and Hispanics were oversampled in the NAS, with interviews conducted in Spanish when necessary or requested. Random-digit dialing was used with dual-frame (landline plus mobile phone) sampling. More details on 2010 and 2015 NAS are available elsewhere.^{32,33}

Measures

Although more categories are likely to provide more accurate measures of healthy behaviors, three of the four risk behaviors were dichotomized to facilitate the identification and interpretation of distinct latent classes.

In light of the literature showing beneficial health effects of moderate drinking on some chronic conditions such as diabetes and ischemic heart disease and poorer health associated with risky drinking^{34–36} and abstinence,^{35,37} past-year alcohol consumption was assessed by an ordinal variable with three categories: (1) abstinence; (2) low-risk drinking of no more than seven (women)/14 (men) drinks per week and three (women)/four (men) drinks per day (at least monthly); and (3) risky drinking that exceeds these limits, following National Institute on Alcohol Abuse and Alcoholism's low-risk drinking guidelines.³⁸

As NAS does not provide information about diet, obesity, defined as a BMI ≥ 30 kg/m²,³⁹ was used. Though not a health behavior per se, obesity is attributed primarily to excess caloric intake⁴⁰ and is a reasonable proxy for unhealthy diet.⁴¹ Obesity warrants consideration as it is among the most prominent risk factors for life-threatening and debilitating conditions such as diabetes.^{3,42}

Using a combination of two items—level of past-month exercise or physical activity (vigorous, moderate, or light) and frequency of exercising for at least 30 minutes—physical inactivity was defined as engaging in vigorous activity fewer than three times a week or moderate activity fewer than five times a week versus more often. This measure approximately reflects the U.S. guidelines recommending 75 minutes of vigorous-intensity activity or 150 minutes of moderate-intensity per week.⁴³

Smoking was assessed by a dichotomous variable indicating smoking cigarettes or any other kind of tobacco in the past 12 months, following prior studies of co-use of alcohol and tobacco.^{44,45}

Marital status was a dichotomous variable indicating married/living with partner versus never married/separated/divorced/widowed. Family income was a dichotomous variable of family income 300% of the federal poverty level versus lower income.⁴⁶ Educational level was a dichotomous variable of a 4-year college or advanced degree versus lower education. Nativity status was a dichotomous variable of being born in the U.S. versus abroad.

Self-rated health status was assessed using a 5-point ordinal Likert-type scale, a validated overall health indicator highly predictive of future morbidity and mortality.⁴⁷ Ordered logistic regression modeling using this scale was explored initially, but because the likelihood ratio test results indicated a violation of the proportional odds assumption,⁴⁸ the responses were dichotomized into the categories of optimal (excellent/very good/good) and suboptimal (fair/poor) health.⁸

Statistical Analysis

This study used LCA to identify clusters of risk behaviors. Analysis was conducted July–November 2018. LCA is a semi-parametric statistical technique that groups individuals into mutually exclusive and substantively meaningful latent classes based on their patterns of risk behaviors.^{49–51} As qualitative differences in latent structures across racial/ethnic groups were anticipated, LCA models were fitted separately for whites, blacks, and Hispanics. The aim in performing these LCAs, therefore, was not to compare latent class prevalence directly across racial/ethnic groups, but rather to identify patterns of clustering within each racial/ethnic group and compare these patterns qualitatively.⁵⁰ For each race/ethnicity, LCA models with one to four classes were applied to the observed data. Model selection was based on model fit indices and statistics including Bayesian information criterion (BIC), Akaike information criterion (AIC), sample-sized adjusted BIC, and Lo–Mendell–Rubin likelihood ratio tests, as well as practical usefulness of the classes to balance their meaningfulness against the quantitative measures of model fit.^{51–53} Bivariate residual diagnostics were examined to assess whether these risk behaviors were correlated significantly with one another, thereby violating the local independence assumption for LCAs,^{50,54} but high bivariate residuals were not found.

After selecting the best-fitting model for each racial/ethnic group, multinomial logistic regression modeling was performed to examine associations of class membership with demographic variables—age, sex, marital status, education, and income, as well as nativity status for Latinos. Hispanic national origin, explored using categories of Mexican, Cuban, Puerto Rican, and other Hispanic, was not significantly associated with class membership and thus not included in the final model. Logistic regression models then tested associations between class membership and self-rated health status, accounting for demographic variables.

This study was approved by the Public Health Institute IRB.

RESULTS

In this sample, whites tended to be older than other groups, and had the highest education levels and family incomes among all three groups, whereas Hispanics were the youngest and

had the lowest SES. Prevalence of risky drinking was highest among whites, and prevalence of smoking, physical inactivity, and obesity were highest among blacks. Whites had higher prevalence of individuals who reported excellent/very good/good health than the other two groups (Table 1).

The fit statistics and practical criteria, taken together, suggested a three-class model as the most parsimonious and substantively sound for each group. Where AIC, BIC, adjusted BIC, and Lo–Mendell–Rubin likelihood ratio tests pointed to different models, BIC and adjusted BIC values were prioritized in model selection, informed by simulation studies suggesting that these are superior to other statistics from LCA models.^{51,55} For whites and blacks, the three-class model had lower AIC and BIC values than the two-class model (and the four-class model for blacks) and further differentiated an additional, substantively meaningful class. The four-class model for whites encountered singularity of the information matrix during model estimation, which automatically disqualified it as a candidate for the final model.^{51,56} For Hispanics, BIC and adjusted BIC values were lower for the three-class model than the two-class and four-class models (Appendix Table 1).

As shown in Figure 1, almost half (49%) of whites were in the “relatively healthy lifestyle” class that was mostly non-smoking (89.2%), and had relatively low prevalence of physical inactivity (22.0%) and obesity (19.5%), and more low-risk drinking (42.3%) than risky drinking (34.3%). The “inactive and obese” class (44% of whites) was physically inactive (94.0%) and had higher prevalence of obesity (40.0%) than the national and white averages (32.6% and 31.2%, respectively; Table 1), smoking prevalence (25.8%) slightly higher than the national average (23.2%), and lower prevalence of risky drinking (20.8%) than low-risk drinking (43.9%) and abstinence (35.3%). A small minority (7%) of whites was in the “smoking and risky drinking” class, largely characterized by smoking (98.3%) and risky drinking (80.3%) but showing relatively low prevalence of physical inactivity (42.6%) and low prevalence of obesity (11.2%).

For Hispanics, about one in five (22%) belonged to the relatively healthy lifestyle class characterized by non-smoking, far less risky drinking (30.8%) than low-risk drinking (59.6%), and low prevalence of obesity (15.0%) and physical inactivity (13.3%). Almost two thirds (64%) were in the inactive and obese class that had very high prevalence of physical inactivity (80.2%) and relatively high prevalence of obesity (40.9%) but low prevalence of smoking (4.8%) and risky drinking (14.4%). The “smoking, inactive, and risky drinking” class (13%) was characterized by smokers (99.4%), relatively high prevalence of inactivity (58.7%), and risky drinking (40.0%) more prevalent than low-risk drinking (21.9%), but relatively low prevalence of obesity (19.7%).

Among blacks, the inactive and obese class (24%) was characterized by physical inactivity (100%), high prevalence of obesity (79.8%), and smoking prevalence (33.3%) higher than the national (23.1%) and black averages (29.1%), but low prevalence of risky drinking (20.2%). The smoking and inactive class (25%) showed very high prevalence of smoking (85.6%) but lower prevalence of obesity (27.3%) and risky drinking (25.5%) and prevalence of physical inactivity (59.8%) slightly higher than the national average (57.3%). About half (51%) of blacks were in the non-smoking and low risky drinking class that had no smokers

and low prevalence of risky drinking (12.2%); still, about half (51.3%) of this class was physically inactive and about one third (32.5%) had obesity.

In multinomial logistic regression models (Table 2), among whites, the inactive and obese class was more likely to be female and older, and the smoking and risky drinking class was more likely to be male, younger, and unmarried, compared with the relatively healthy lifestyle class. Both unhealthy lifestyle classes were likely to have lower education and family income than the relatively healthy lifestyle class. For Hispanics, the inactive and obese class was more likely to be female, older, married, and foreign-born than the relatively healthy lifestyle class. The inactive and obese class was more likely to lack a college degree, and the smoking and risky drinking class was more likely to lack a college degree and have lower family income than the relatively healthy lifestyle class. Among blacks, the inactive and obese class was more likely to be female and the smoking and inactive class more likely to be male, and both classes had lower education and incomes, than the non-smoking and low risky drinking class.

In logistic regression models (Table 3), the relatively healthy lifestyle class was less likely to report fair/poor health than were the unhealthy lifestyle classes for both whites and Hispanics. For blacks, the inactive and obese class and the smoking and inactive class were likely to have poorer health status than the non-smoking and low risky drinking class.

DISCUSSION

Significant commonalities were found across whites, blacks, and Hispanics in the clustering of risk behaviors and its associations with SES and health status, albeit with some differences. The relatively healthy lifestyle class that showed fairly low prevalence of the four lifestyle risk factors and associated with higher SES was found among whites and Hispanics. For blacks, although the non-smoking and low risky drinking class, which was associated with higher SES, had a healthier lifestyle than the other two black classes in these respects, more than half of individuals in this class were inactive and about one third had obesity, making it difficult to characterize this class as having a healthy lifestyle. The inactive and obese class, more likely to be female and older (the latter except for Hispanics), was observed in all three racial/ethnic groups.

Notably, individuals who belonged to the relatively healthy lifestyle classes were in the minority. Furthermore, none of the healthier lifestyle classes were entirely healthy; about one in three whites and Hispanics in the respective relatively healthy lifestyle class were risky drinkers, although these proportions were still lower than those of moderate drinkers. These findings are consistent with prior studies that found co-occurrence of multiple health risk behaviors in the majority of U.S. adults,^{4,57} demonstrating a critical need to improve lifestyles in them.

Overall, the associations between a healthier lifestyle and higher SES that were found for all three groups are consistent with prior findings that linked higher SES with healthy lifestyles.^{6,11,58} Higher educational attainment and income afford a greater capacity to engage in healthier behaviors owing to greater financial resources, better employment with control

over work schedules, better access to healthy foods and exercise facilities, and enhanced social networks, all of which are more conducive to health-promoting behaviors.^{59–61}

The absence of a healthy lifestyle class among blacks is notable. As blacks overall had higher income and education levels than Hispanics (Table 1), socioeconomic factors alone may not explain these disparities. These findings suggest limited benefits of higher SES on health behaviors for blacks, lending partial support to the diminishing returns thesis.^{16,21} Unhealthy lifestyles among blacks are generally attributed to racial inequities many blacks experience, such as low occupational achievements (even at the same education level as whites), racial discrimination combined with fear of police because of racial profiling, and living in deprived neighborhoods with few health-promoting resources, which may trigger health risk behaviors to cope with these stressors^{62–64} or distract individuals from health-seeking behaviors.^{65,66}

Additionally, cultural norms and expectations may also play a role. For example, there is a perception that eating healthy is tantamount to giving up part of a cultural heritage^{67,68} and a preference for a curvaceous female body shape^{68–70} in black communities, which may lessen motivation for a healthier lifestyle.^{30,71} Low social support for health-promoting activities in black communities such as healthy diet or regular exercise has also been noted as a barrier to a healthy lifestyle.^{70,72,73} As noted previously, health disparities adversely affecting blacks are rooted in the fundamental conditions of social context and experience, defined more by being black than by being of lower SES,⁷⁴ which may lead to diminishing returns of socioeconomic advantage on health behaviors.

Limitations

Several limitations of this study should be acknowledged. Limited attention to potential measurement non-invariance of risk measures across sex is a limitation. Sex differences in the clustering of risk behaviors were not explored in order to maximize statistical power for racial/ethnicity-specific analyses and also to keep the focus on racial/ethnic differences. Still, multinomial regressions conducted in this study capture sex differences in clustered risk behaviors to a certain degree. Though reasonable,⁴¹ the use of obesity as a proxy for unhealthy diet is a limitation. The use of mostly dichotomized variables in LCAs may have limited the ability to capture the varying degree of healthfulness of behaviors and hampered a more nuanced understanding of clustered risk behaviors. Given the cross-sectional design of the study, caution is urged in inferring causal relationships. Future research to examine long-term effects of clustered risk behaviors (including poor diet per se) in a longitudinal design, also considering environmental factors and support networks that may influence opportunities and motivations for healthier lifestyles, would be informative.

Important strengths of this study also deserve mention. This is the first study to identify common and diverging patterns of clustered risk behaviors across racial/ethnic groups to inform targeted intervention strategies. The inactive-and-obese class observed in all three groups, along with pervasiveness of inactivity and obesity in some of the other classes as well, demonstrates the critical need to address these for most U.S. adults. Smoking was featured in the other unhealthy lifestyle classes, clustered with different risk behaviors—with risky drinking among whites, with inactivity among blacks, and with risky drinking and

inactivity among Hispanics. Adverse health outcomes associated with co-use of tobacco and alcohol are well-documented,^{44,75,76} but clustering of smoking and inactivity among racial/ethnic minorities, though affecting a small minority, was a new and unexpected finding (especially for Hispanics who had the lowest prevalence of smoking) and warrants further attention. Although higher SES was consistently associated with healthier lifestyles for all three groups, a healthy lifestyle class was particularly absent among blacks. In reporting that blacks overall are collectively less likely than other groups to have a healthy lifestyle and to experience diminishing returns of socioeconomic advantage, this study suggests a key mechanism (involving unhealthy lifestyles) that may lead to poorer health outcomes among blacks, adding novel and nuanced findings to the health disparities literature.

CONCLUSIONS

Interventions targeting multiple risk behaviors can have a greater impact on health outcomes than those targeting a single risk factors,⁷⁶ as they can be delivered more efficiently, while allowing for discussion of the interrelationships among risk factors.⁷⁷ The current findings point to the need for multi-behavior interventions to improve the health of the vast majority of U.S. adults.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Figure 1.
Classes of clustered risk behaviors among whites, blacks, and Hispanics.

Table 1.

Sample Characteristics

Characteristics	Full sample	White	Black	Hispanic	p-value
n (%) Sex	9,761 (100)	5,288 (73.1)	2,321 (12.4)	2,152 (14.5)	
Female	5,795 (50.5)	50.4	53.1	48.7	>0.05
Male	3,966 (49.5)	49.6	46.9	51.3	
Age, years					
30–39	1,872 (26.9)	24.5	30.5	35.6	
40–49	2,333 (26.9)	26.2	26.3	30.7	****
50–59	2,874 (27.1)	28.4	25.5	21.5	
60–69	2,682 (19.2)	20.8	17.7	12.2	
Educational level					
No high school diploma	1,138 (13.4)	8.0	19.7	35.2	
High school graduation	2,453 (27.2)	26.9	32.8	23.9	****
Some college education	2,452 (30.3)	31.1	30.0	26.6	
College degree or more	3,696 (29.1)	34.0	17.7	14.3	
Family income					
Low income (<300% of Federal Poverty Level)	3,897 (45.1)	39.2	59.2	63.8	****
High income (>300% of Federal Poverty Level)	4,533 (54.9)	60.8	40.8	36.2	
Marital status					
Married/Living with partner	5,410 (69.1)	72.8	45.5	70.2	
Never married/Divorced/Separated/Widowed	3,452 (30.9)	27.2	54.6	30.0	****
Nativity status					
Foreign-born	1,523 (11.5)	4.0	7.6	52.1	
U.S.-born	8,228 (88.5)	96.0	92.4	47.9	****
Health insurance coverage					
No	1,223 (14.1)	10.1	16.8	31.9	
Yes	8,407 (85.9)	89.9	83.2	68.2	****
Alcohol consumption					
Abstinent	3,484 (31.9)	27.7	42.9	44.4	
Moderate drinking	3,980 (39.5)	40.6	38.8	34.3	****
Risky drinking	2,093 (28.6)	31.7	18.3	21.3	
Current smoking					
No	7,915 (76.8)	76.4	70.9	84.1	
Yes	1,846 (23.2)	23.6	29.1	15.9	****
Weight status					
Under/Normal weight	2,575 (31.8)	33.1	24.3	31.2	
Overweight	2,962 (35.7)	35.8	34.2	36.6	***
Obese	2,759 (32.6)	31.2	41.5	32.3	
Physical activity					
Active	3,954 (42.7)	45.0	35.5	37.3	
Inactive	5,807 (57.3)	55.0	64.5	62.7	****

Characteristics	Full sample	White	Black	Hispanic	p-value
Health status					
Fair/Poor	2,202 (20.2)	17.7	27.3	26.3	
Excellent/Very good/Good	7,559 (79.8)	82.3	72.7	73.7	****

Notes: Data presented as n (weighted percentage).

Table 2.

Demographic Profiles of Clustered Risk Behavior Classes: Multinomial Regressions

Variables	Whites (n=4,589)		Blacks (n=1,945)		Hispanics (n=1,789)	
	Inactive and obese class ^f	Smoking and risky drinking class ^f	Inactive and obese class ^g	Smoking and inactive class ^g	Inactive and obese class ^h	Smoking, inactive, and risky drinking class ^h
	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)
Male ^a	0.67**** (0.57, 0.79)	1.44* (1.05, 1.98)	0.46** (0.28, 0.76)	1.64* (1.02, 2.63)	0.40**** (0.26, 0.62)	0.91 (0.52, 1.59)
Age	1.02**** (1.01, 1.02)	0.95**** (0.94, 0.96)	1.02 (1.00, 1.04)	1.01 (0.99, 1.03)	1.03* (1.01, 1.05)	1.01 (0.99, 1.04)
Married/ Living with partner ^b	0.97 (0.80, 1.18)	0.45**** (0.32, 0.64)	0.75 (0.47, 1.20)	0.82 (0.50, 1.33)	1.75* (1.08, 2.84)	1.09 (0.61, 1.95)
At least college degree ^c	0.51**** (0.43, 0.61)	0.46**** (0.33, 0.65)	0.46* (0.24, 0.86)	0.54* (0.31, 0.96)	0.71 (0.43, 1.17)	0.44* (0.21, 0.93)
High income ^d	0.67**** (0.55, 0.81)	0.61**** (0.43, 0.86)	0.57* (0.33, 0.98)	0.38**** (0.22, 0.64)	0.45** (0.27, 0.73)	0.38** (0.20, 0.70)
U.S.-born ^e	—	—	—	—	0.60* (0.38, 0.96)	1.66 (0.90, 3.03)

Notes: Boldface indicates statistical significance (**** $p < 0.0001$; **** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$).

^aFemale as reference category.

^bNever married/separated/divorced/widowed as reference category.

^cNo 4-year college degree as reference category.

^dLow family income as reference category.

^eForeign-born as reference category.

^fRelatively healthy lifestyle class among whites as reference category.

^gNon-smoking and low risky drinking class among blacks as reference category.

^hRelatively healthy lifestyle class among Hispanics as reference category.

Table 3.Associations Between Clustered Risk Behavior Classes and Self-Reported Fair/Poor Health^a

Variables	Whites (n=4,562) AOR (95% CI)	Blacks (n=1,965) AOR (95% CI)	Hispanics (n=1,806) AOR (95% CI)
Male ^b	1.08 (0.86, 1.35)	0.66 (0.43, 1.00)	0.84 (0.57, 1.24)
Age	1.02**** (1.01, 1.03)	1.04**** (1.02, 1.06)	1.04**** (1.02, 1.06)
Married/Living with partner ^c	0.69** (0.54, 0.88)	0.59* (0.39, 0.89)	0.61* (0.40, 0.92)
At least college degree ^d	0.40**** (0.31, 0.51)	0.92 (0.51, 1.65)	0.30** (0.15, 0.61)
High income ^e	0.35**** (0.28, 0.45)	0.55* (0.33, 0.93)	0.54* (0.33, 0.91)
Health insurance coverage ^f	1.30 (0.89, 1.90)	0.52* (0.29, 0.92)	0.95 (0.59, 1.53)
U.S.-born ^g	—	—	0.49** (0.33, 0.75)
Inactive and obese class class ^h	5.01**** (3.70, 6.77)	—	—
Smoking and risky drinking class ^h	2.47**** (1.49, 4.11)	—	—
Inactive and obese class ⁱ	—	2.97**** (1.78, 4.98)	—
Smoking and inactive class ⁱ	—	1.66* (1.00, 2.76)	—
Inactive and obese class ^j	—	—	2.20* (1.20, 4.02)
Smoking, inactive, and risky drinking class ^j	—	—	3.79** (1.77, 8.11)

Notes: Boldface indicates statistical significance (**** $p < 0.0001$; **** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$).

^aExcellent/Very good/Good health as reference category.

^bFemale as reference category.

^cNever married/Separated/Divorced/Widowed as reference category.

^dNo 4-year college degree as reference category.

^eLow family income as reference category.

^fNo insurance coverage as reference category.

^gForeign-born as reference category.

^hRelatively healthy lifestyle class among whites as reference category.

ⁱNon-smoking and low risky drinking class as reference category.

^jRelatively healthy lifestyle class among Hispanics as reference category.