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Differences in Hypertension by Sexual Orientation Among U.S. Young Adults

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Abstract

Using a nationally representative data set, this study provides the first estimates of differences in hypertension by sexual orientation using objective measures of systolic and diastolic blood pressure. Logistic regressions showed that there were no differences in hypertensive risk between mostly heterosexual/bisexual identified-respondents and heterosexual-identified respondents among both men and women. Gay men, however, are almost twice as likely (odds ratio = 1.92, $p < .01$) to be hypertensive compared to heterosexual men. The elevated risk is not explained by measures of minority stress, nor by cardiovascular disease risk factors such as smoking, alcohol use, drug use, BMI, or physical activity. No differences in hypertension risk by sexual orientation were detected among female respondents. The results suggest that gay men face an excess risk for hypertension compared to heterosexual men that is not explained by differences in measured health behaviors.

Keywords

Hypertension; Sexual orientation; Lesbians; Gays; Health behavior

Introduction

Hypertension affects roughly one-third of the U.S. population and is a major risk factor for cardiovascular disease [1]. While the risk of hypertension increases dramatically with age, the incidence of hypertension is growing among younger populations [2]. Using measured systolic blood pressure, two recent studies using the National Longitudinal Study of Adolescent Health data found that 12 % of U.S. young adults had systolic blood pressure >140 mm HG [3, 4]. Compared to the large body of work that has examined disparities related to the mental and sexual health of gay and bisexual men and women, little work has investigated physical health disparities among this population and addressing this gap in the literature was recently recognized as a Healthy People 2020 Objective [5, 6]. This study is the first to use objective measures of systolic and diastolic blood pressure to examine differences by sexual orientation in hypertension among a population-based sample of U.S. young adults.

Gay and bisexual men and women may be at risk for worse cardiovascular health outcomes than their heterosexual peers for several reasons. First, studies have documented high levels

of tobacco and drug use among gay and bisexual persons [7–10], both of which may contribute to increased risk of cardiovascular disease [11–13]. Second, gay and bisexual men and women report barriers to accessing health care, including lower rates of insurance and higher rates of discrimination from doctors and health care professionals [14–17]. These barriers may decrease the likelihood that hypertension will be detected, and if hypertension is diagnosed, that sexual minorities will seek treatment.

Third, a growing body of literature has found that in addition to CVD risk behaviors such as tobacco and alcohol use, experiences with victimization and discrimination may also impact cardiovascular health [18–24]. Much research has documented both elevated rates of exposure to victimization and discrimination among sexual minority men and women [25–27]; however, less work has examined the effect of victimization and discrimination on cardiovascular health disparities by sexual orientation.

The existing research on physical health disparities by sexual orientation suggests additional reasons why sexual minorities may be at risk for poor health. For example, some work has suggested that this group has an increased risk of being overweight or obese [28–31], and other work has shown that sexual minority men and women are more likely to report specific morbidities and chronic conditions, such as arthritis, ulcers, and chronic fatigue syndrome [32]; cancer [33]; asthma and respiratory problems [34, 35]; and osteoarthritis and serious intestinal problems [35]. No study to date, however, has examined disparities in blood pressure by sexual orientation. Using a population-based survey sample of U.S. young adults using objective measures of systolic and diastolic blood pressure, the aims of this study were:

1. To determine if gay and bisexual persons are more likely to be hypertensive than heterosexual identified persons.
2. To assess if indicators of victimization and discrimination [18, 19], cardiovascular risk factors such as smoking [36], BMI [37], and low physical activity [38] explain differences in hypertension by sexual orientation.

Materials and Methods

Study Sample

This study used data from Wave IV of the National Longitudinal Study of Adolescent Health (Add Health), a nationally representative U.S. sample drawn from 80 high schools and 52 middle schools, with unequal probability of selection [39]. Wave IV of the Add Health survey, collected between 2007 and 2008, located 92.5 % of the original sample and interviewed 80.3 % of the eligible respondents, whose ages ranged from 24 to 34 years old. The total number of eligible respondents was 14,800, of which 126 (0.9 %) either answered, “don’t know” or refused to answer the sexual orientation questions. Another 441 (3.0 %) respondents were excluded for not having blood pressure information or for missing information on other covariates used in the analysis, resulting in a total sample size of 6,678 men (mean age = 28.9; SE = 0.12) and 7,555 women (mean age = 28.7; SE = 0.12). The research was approved by the University of Colorado’s institutional review board.

Sexual Orientation Measures

Sexual orientation was derived from a question that asked respondents, “Please choose the description that best fits how you think about yourself: 100 % heterosexual (straight) [referent]; mostly heterosexual (straight), but somewhat attracted to people of your own sex; bisexual—that is, attracted to males and females equally; mostly homosexual (gay), but somewhat attracted to people of the opposite sex; and 100 % homosexual (gay).” Due to

sample size limitations, respondents who reported a bisexual or mostly heterosexual identity were collapsed into the same category, as were gay and mostly gay identified respondents. Adjusted Wald tests assessing differences in odds ratios (ORs) in sex-stratified analysis showed that the ORs for gay and mostly gay-identified respondents did not significantly differ for either men or women, nor did the ORs for bisexual or mostly heterosexual-identified respondents differ.

Blood Pressure Measurements

Interviewers collected three readings of systolic and diastolic blood pressure at the time of interview with 30-s intervals between measurements. Systolic and diastolic scores were constructed as the mean scores from the second and third measurements and coded as normotensive (<40 SBP and <90 DBP) (referent) or hypertensive (≥140 SBP and ≥90) [40]. Sensitivity analysis removing hypotensive (<100 SBP or <60 DBP) respondents from the sample showed no significant difference in the ORs for both men and women; therefore they were included in the referent category. Following the recommendation of Tobin et al. [41], we adjusted for hypertension treatment by adding 10 mmHg to the SBP of respondents who reported being on hypertensive medication; however, results from analyses with and without this adjustment, and from analyses excluding respondents taking hypertensive medication, were similar.

Cardiovascular Risk Factors

This study included several variables that might explain disparities in hypertension by sexual orientation.

Physical victimization in the previous 12 years was coded as a binary variable derived from a series of questions that asked respondents: “Which of the following things happened in the last month: someone pulled a knife or gun on you; someone shot or stabbed you; someone slapped, hit, choked, or kicked you; you were beaten up?” Respondents who reported at least one of these incidents were coded as reporting being victimized in the last 12 months or not (referent). Discrimination was measured using the question, “In your day-to-day life, how often do you feel you are treated with less respect or courtesy than other people?” We created a dummy variable that captures whether respondents reported being treated with less respect never or rarely (referent) versus sometimes or often.

The tobacco use variable measured whether respondents were current regular smokers, operationalized as at least one cigarette a day for 30 days, former regular smokers, or never regular smokers (referent). Respondents were asked, “During the past 12 months, on how many days did you drink 5 or more (if male) or 4 or more (if female) drinks in a row?” Respondents were coded as binge drinking zero to once a month or less (referent), 2–8 times in a month, or greater than 3 days a week. Drug use was coded as a dichotomous measure that captured whether in the last 12 months respondents reported using controlled substances (sedatives, tranquilizers, stimulants, prescribed pain killers, steroids, cocaine, or marijuana). Respondents reporting yes were coded as 1, and respondents reporting no substance use in the last 12 months were coded as 0 (referent).

Anthropometric measures of height and weight were taken at the time of interview and used to calculate BMI for respondents. We used the World Health Organization (WHO) obesity classifications to measure whether respondents were underweight (BMI < 18), healthy weight (BMI ≥ 18 and BMI < 25), overweight (BMI ≥ 25 and BMI < 30), obese class I (BMI ≥ 30 and BMI < 35), obese class II (BMI ≥ 35 and BMI < 40), or obese class III (BMI ≥ 40) (referent) [42].

Physical activity was coded as a series of dummy variables derived from a series of questions that asked respondents how many times in the past week they engaged in a variety of physical activities such as bicycling, skateboarding, hiking, roller blading, team sports, aerobics, individual sports, weight training, or walking for exercise. Respondents who reported zero bouts of physical activity in the last 7 days were coded as having a “low” level of activity of physical activity; respondents who reported 1–6 bouts of physical activity in the past 7 days were coded as “medium” activity; and respondents who reported 7 or more bouts of physical activity in the past 7 days were coded as “high” activity (referent).

Demographic Measures

All analyses controlled for race/ethnicity, age, and education. Race/ethnicity was categorized as non-Hispanic white (referent); non-Hispanic black; Hispanic; non-Hispanic Asian; or other. Age was coded as a continuous variable ranging from 24 to 34 years. Education was measured as a series of dummy variables that identified whether respondents had less than a high school education, graduated from high school, had attended some college, or graduated from college or received post-graduate education (referent).

Statistical Analysis

First, weighted descriptive statistics stratified by sex for the total population, as well as by sexual orientation, are presented in Table 1. Bivariate tests were used to assess significant differences between completely heterosexual and bisexual/mostly heterosexual respondents, as well as significant differences between completely heterosexual and gay/mostly gay respondents. Associations between sexual orientation and hypertension were then assessed using multivariate logistic regression and are presented in Table 2 for men and Table 3 for women. In both Tables 2 and 3, Model 1 adjusted for age, race/ethnicity, and education. Model 2 adjusted for covariates in Model 1 and added controls for victimization and discrimination. Model 3 controlled for all covariates in Model 2 and added smoking status, binge drinking, and drug use. Model 3 controlled for all covariates in Model 2 and added BMI and physical activity to the analysis. Pooled models that included an interaction between female and sexual orientation revealed significant differences in hypertension risk by sex; thus all models were split by sex. All results corrected for Add Health’s complex survey design (weighting to make the findings nationally representative of the U.S. population, clustering within Wave 1 schools, and stratification by region) using the “svy” commands in Stata 11.0.

Results

Descriptive Statistics

Table 1 presents the descriptive statistics for men. Of the 6,678 eligible male respondents, 6,222 (93.2 %) identified as 100 % heterosexual, 275 (4.1 %) identified as mostly heterosexual or bisexual, and 181 (2.7 %) identified as mostly gay or 100 % gay.

Bivariate tests showed that gay men had a higher prevalence of hypertension (38.7 %) than heterosexual men (27.2 %) and that many risk factors for hypertension also varied significantly by sexual identification for men. For example, gay men had a lower prevalence of binge drinking more than 8 times in 1 month, but both bisexual and gay men were more likely to report drug use in the previous 12 months than heterosexual men. There were no significant differences in current regular smoking by sexual orientation, but bisexual and mostly heterosexual respondents were more likely to be former regular smokers (33.4 %) compared to 100 % heterosexual respondents (23.7 %). Bisexual and mostly heterosexual men were more likely to have BMIs in the healthy range and gay men had lower rates of Class II obesity than heterosexual men.

Of the 7,555 female respondents, 6,072 (80.4 %) identified as heterosexual; 1,345 (17.8 %) identified as mostly heterosexual or bisexual; and 138 (1.8 %) identified as mostly gay or 100 % gay.

Bivariate tests reveal that there were no differences in hypertension by sexual orientation among women; however, risk factors varied by sexual orientation. Both bisexual and gay women were more likely to report significantly higher prevalence of binge drinking compared to heterosexuals: 18 % of gay women reported binge drinking 8 or more times in the previous month compared to 3 % of bisexual and 1.5 % of heterosexual respondents. Gay and bisexual women also reported higher rates of drug use in the previous 12 months. Moreover, bisexual (30 %) and gay (29 %) women had a higher prevalence of regular smoking compared to heterosexual women (20 %).

Multivariate Analyses

Table 2 presents the results from logistic regressions for male respondents: there was no relationship between bisexual or mostly heterosexual identification and hypertension compared to heterosexual men in either Model 1, Model 2, or Model 3. Model 1 showed that gay men have 72 % higher risk ($OR = 1.72, p < .05$) of being hypertensive compared to heterosexual men.

Controlling for victimization in Model 2 and substance use in Model 3 does not mediate the relationship between being gay and elevated hypertension risk. Controlling for BMI and physical activity in Model 4 increased the disparity between gay and heterosexual men: Gay men were nearly twice as likely to be hypertensive compared to 100 % heterosexual respondents ($OR = 1.92, p < .01$). Supplementary analyses where each risk factor was entered into the model separately revealed that controlling for BMI drives this suppression effect. Indeed, referring back to Table 1, the descriptive statistics showed that gay men had the highest prevalence of healthy BMIs; when all classes of obesity are combined, 36 % of the heterosexual-identified male population is obese compared to 27 % of the gay-identified population.

Among women, Model 1 of Table 3 showed no difference in hypertension risk by sexual orientation. The lack of a relationship between sexual orientation and hypertension persisted in Models 2, 3 and 4.

Additional analyses not shown tested the mediating effects of health insurance and delayed care, but these variables did not explain the relationship between sexual orientation and hypertension for men or women. Additional analyses that stratified the sample by weight status (not obese vs. obese) showed that gay men had an elevated risk of hypertension compared to heterosexual men in both weight categories.

Discussion

The results presented in this paper are the first to analyze disparities in measured hypertension by sexual orientation using a population-based sample. The results show that for both women and men, there were no significant differences in the risk of hypertension between bisexual or mostly heterosexual respondents and heterosexual respondents. Further, there was no difference between gay-identified and heterosexual-identified women's risk of hypertension.

Gay or mostly gay men face almost twice the risk of being hypertensive compared to heterosexual men. This relationship persisted even after important cardiovascular disease risk factors were included as controls in the model; in fact, BMI and physical activity had a

suppressor effect such that the OR for hypertension among gay men increased in magnitude from Model 1 to Model 4. This effect was primarily driven by gay men's lower prevalence of obesity compared to heterosexual men.

The lack of explanatory power of cardiovascular risk factors included in this analysis may indicate measurement error in the covariates included in the analysis, but also suggests that other processes may be at work that place gay men at risk for hypertension. Increased exposure to stigma and discrimination may in part explain gay men's increased cardiovascular risk: The two basic measures of discrimination included in these analysis may not sufficiently capture pervasive structural discrimination that could influence hypertension. However, if minority stress is the primary pathway influencing gay men's increased hypertensive risk compared to heterosexual men, one would expect that gay women would also have elevated risk of hypertension, yet the results presented here suggest that sexual minority women are not more likely to be hypertensive.

The sex differences in hypertension by sexual orientation warrant further investigation, but may in part be explained by differences in the prevalence of hypertension between men and women: Women have lower prevalence of hypertension compared to men until around the age of 60 [43]. In this sample, hypertension prevalence among the total population of women is 11.5 % compared to 26.5 % among the total male population. The smaller percentage of hypertensive female respondents may make elevated rates of hypertension difficult to detect in this population at this age. Indeed, supplementary analyses showed that when the sample was restricted to those who were normotensive, gay women had an elevated risk of being pre-hypertensive compared to heterosexual women. This result, in conjunction with higher prevalence of obesity and smoking among sexual minority women, indicates that sexual minority women may face an increased risk of becoming hypertensive as they continue to age.

This study has several limitations. As stated before, our sample represented a relatively young population; thus, it is possible that cardiovascular disparities not documented here may emerge later in the life course between sexual minority women and heterosexual women. Second, our measures of discrimination and victimization do not fully capture the multitude of ways in which stigma may increase stress among sexual minority persons. We also do not have data on gender-identity expression, which may influence the degree of exposure to minority stress and stigma [44, 45].

These results suggest that public health researchers should incorporate physical health disparities when formulating policy recommendations for improving the health of sexual minority populations. Future research should investigate other potential explanatory pathways for gay men's elevated risk of hypertension in young adulthood. The results presented here suggest that differences in physical activity and smoking factors do not explain these men's excess risk. Researchers should continue to investigate the potential risk of elevated hypertension among older sexual minority female populations.

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Abbreviations

CVD	Cardiovascular disease
OR	Odds ratio
CI	Confidence interval

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Table 1

Descriptive Statistics fertile total male population and bysexual orientation

	Total population % (SE)	Completely heterosexual % (SE)	Bisexual/mostly heterosexual % (SE)	Gay/mostly gay % (SE)
	N = 6678	N = 6238	N = 271	N = 178
Victimized, previous 12 months	24.39 (0.83)	24.54 (0.85)	21.55 (3.12)	23.40 (4.09)
Perceived discrimination	24.42 (0.94)	23.95 (0.99)	37.84 (5.72)***	19.07 (3.76)
Binge drinking, previous 12 months				
< 2 times a month	59.23 (1.25)	59.60 (1.28)	52.45 (3.46)*	56.53 (5.60)
2 and < 8 times a mirth	34.42 (1.19)	34.11 (1.19)	37.45 (3.80)	41.65 (5.67)
> 8 times a month	6.35 (0.41)	6.30 (0.43)	10.10 (2.62)	1.82 (1.37)**
Drug use, previous 12 months	32.18 (1.03)	31.25 (1.07)	47.91 (4.03)*	41.36 (5.26)*
Smoking				
Never smoker	48.01 (1.14)	48.28 (1.22)	40.26 (4.08) ⁺	50.87 (5.76)
Former smoker	24.12 (0.70)	23.73 (0.72)	33.42 (4.00)*	23.16 (4.53)
Current smoker	27.26 (1.05)	27.34 (1.09)	26.33 (3.56)	25.94 (4.72)
Missing	1.02 (0.21)	1.01 (0.22)	1.78 (1.06)	0.03 (0.03)***
BMI				
< 18	0.80 (0.16)	0.76 (0.15)	1.05 (0.84)	1.85 (1.85)
18 and < 25	30.15 (0.90)	29.35 (0.89)	43.24 (4.85)**	39.32 (4.44)*
> 25 and 30	34.62 (0.83)	34.92 (0.86)	28.43 (4.29)	33.60 (4.59)
> 30 and 35	20.42 (0.67)	20.63 (0.70)	17.13 (3.10)	17.70 (3.82)
> 35 and 40	8.47 (0.50)	8.66 (0.51)	7.05 (1.93)	2.79 (1.46)***
> 40	6.34 (0.42)	6.43 (0.45)	4.15 (1.49)	6.59 (2.73)
Physical activity				
Low	12.66 (0.62)	12.42 (0.63)	16.57 (2.60)	10.61 (3.20)
Medium	41.05 (0.92)	41.33 (0.94)	33.99 (3.97) ⁺	42.13 (4.72)
High	46.24 (1.01)	46.08 (1.02)	49.43 (4.00)	47.23 (4.87)
Hypertensive (> 140 SBP and > 90)	27.37 (0.83)	27.18 (0.83)	25.35 (3.67)	38.74 (5.59)*
Systolic BP	130.11 (0.27)	130.07 (0.27)	129.82 (1.21)	132.40 (1.42)
Diastolic BP	81.68 (0.19)	81.59 (0.20)	82.05 (0.97)	84.37 (1.26)**
	Women			
	N = 7,555	N = 6,072	N = 1,345	N = 138
Victimised, previous 12 months	18.57 (0.64)	17.56 (0.70)	22.56 (1.52)**	23.78 (5.44)
Perceived discrimination	24.33 (0.77)	23.23 (0.81)	29.02 (1.75)***	25.97 (4.63)
Binge drinking, previous 12 months				
< 2 times a month	75.38 (0.90)	78.34 (0.89)	64.22 (1.85)***	54.17 (5.60)***

	Total population % (SE)	Completely heterosexual % (SE)	Bisexual/mostly heterosexual % (SE)	Gay/mostly gay % (SE)
Men				
	N = 6678	N = 6238	N = 271	N = 178
2 and < 8 times a month	22.52 (0.91)	20.17(0.87)	32.46 (1.83) **	27.60 (5.11)
> 8 times a month	2.10 (0.24)	1.48 (0.25)	3.32 (0.60) *	18.23 (5.54) **
Drug use, previous 12 months	21.34 (0.82)	16.24 (0.75)	41.28 (2.03) ***	48.25 (5.53) **
Smoking				
Never smoker	54.79 (1.35)	58.93 (1.38)	38.36 (2.11) ***	35.18 (5.17) ***
Former smoker	22.97 (1.11)	20.81 (0.82)	31.34 (1.73) ***	35.93 (5.34) **
Current smoker	21.97 (1.11)	20.02 (1.10)	29.97 (1.99) ***	28.89 (5.66) ***
Missing	0.51 (0.12)	0.52 (0.14)	0.52 (0.23)	–
BMI				
< 18	2.11 (0.21)	2.10 (0.25)	2.23 (0.54)	1.51 (1.38)
18 and < 25	37.43 (1.03)	37.10 (1.10)	39.51 (2.16)	30.24 (5.35)
> 25 and 30	25.17 (0.74)	25.52 (0.82)	24.00 (1.66)	21.24 (4.71)
>30 and 35	16.60 (0.56)	16.53 (0.69)	16.92 (1.30)	16.64 (5.14)
>35 and 40	10.82 (0.55)	11.06 (0.61)	9.36 (1.06)	15.16 (3.89) *
>40	9.99 (0.56)	9.79 (0.56)	10.20 (1.17)	16.71 (4.30)
Physical activity				
Low	16.56 (0.69)	17.19 (0.81)	13.82 (1.37) *	16.07 (5.00)
Medium	47.70 (0.84)	47.83 (0.92)	47.48 (1.90)	43.95 (5.26)
High	35.73 (1.00)	34.98 (1.07)	38.66 (1.81) *	39.97 (5.55)
Hypertensive (>140 SBP and >90)	11.99 (0.59)	12.17 (0.65)	11.38 (1.19)	10.32 (3.21)
Systolic BP	120.26 (0.25)	120.21 (0.28)	120.26 (0.53)	122.67 (1.15)
Diastolic BP	76.89 (0.20)	76.89 (0.21)	76.79 (0.40)	77.74 (0.83)

Source Wane IV National Longitudinal Study of Adolescent Health

SE standard error; analyses are weighted to account for complex survey design

* $p < .05$;

** $p < .01$;

*** $p < .001$;

+ $p < .10$

Table 2

Odds ratios for sexual orientation differences in hypertension among Men

	Men			
	Model 1 OR (95 % CI)	Model 2 OR (95 % CI)	Model 3 OR (95 % CI)	Model 4 OR (95 % CI)
Sexual orientation (completely heterosexual)				
Gay/mostly gay	1.72 (1.10, 2.71)*	1.72 (1.09, 2.71)*	1.69 (1.05, 2.66)*	1.92 (1.18, 3.14)**
Bisexual/mostly heterosexual	0.91 (0.62, 1.32)	0.92 (0.62, 1.35)	0.89 (0.60, 1.30)	0.99 (0.66, 1.49)
Age	1.05 (1.01, 1.10)*	1.05 (1.00, 1.10)*	1.06 (1.01, 1.11)*	1.05 (1.00, 1.10)*
Race/ethnicity (non-Hispanic white)				
Non-Hispanic black	0.86 (0.72, 1.03) [†]	0.88 (0.74, 1.06)	0.92 (0.77, 1.11)	0.93 (0.78, 1.11)
Hispanic	0.95 (0.74, 1.24)	0.96 (0.74, 1.24)	0.99 (0.76, 1.28)	0.93 (0.70, 1.23)
Asian	1.21 (0.88, 1.67)	1.20 (0.88, 1.65)	1.24 (0.90, 1.69)	1.33 (0.97, 1.82)
Other	1.17 (0.66, 2.05)	1.17 (0.66, 2.07)	1.18 (0.68, 2.07)	1.08 (0.65, 1.78)
Education (college graduate)				
Less than high school	1.28 (1.00, 1.64)*	1.33 (1.04, 1.69)*	1.33 (1.02, 1.73)*	1.21 (0.91, 1.60)
High school graduate	1.20 (0.94, 1.52)	1.22 (0.95, 1.54)	1.21 (0.95, 1.55)	1.08 (0.83, 1.41)
Some college	1.13 (0.95, 1.33)	1.14 (0.97, 1.35)	1.15 (0.96, 1.37)	0.97 (0.82, 1.16)
Victimized, previous 12 months		0.85 (0.71, 1.03)	0.83 (0.68, 1.01) [†]	0.83 (0.68, 1.02)
Perceived discrimination		0.91 (0.75, 1.11)	0.91 (0.75, 1.11)	0.90 (0.74, 1.11)
Smoking (never smoker)				
Current smoker			1.02 (0.83, 1.25)	1.16 (0.93, 1.44)
Former smoker			1.02 (0.82, 1.26)	1.04 (0.84, 1.30)
Missing			0.66 (0.32, 1.39)	0.64 (0.26, 1.58)
Binge drinking, previous 12 months (< 2 times a month)				
2 and < 8 times a month			1.01 (0.86, 1.20)	1.05 (0.88, 1.26)
> 8 times a month			1.31 (1.06, 1.61)**	1.53 (1.23, 1.89)***
Drug use, previous 12 months			1.11 (0.94, 1.30)	1.21 (1.02, 1.42)*
BMI (> 18 and < 25)				
< 18				1.02 (0.42, 2.49)
> 25 and 30				1.80 (1.43, 2.26)***
> 30 and 35				2.82 (2.20, 3.62)***
> 35 and 40				4.37 (3.14, 6.09)***
> 40				6.07 (4.25, 8.66)***
Physical activity level (high)				
Low				1.00 (0.76, 1.31)
Medium				0.98 (0.84, 1.14)

Source Wave IV National Longitudinal Study of Adolescent Health

Analyses are weighted to account for complex survey design

OR odds ratio, *CI* confidence interval; reference category in parentheses; N = 6,750; Model 1 controls for race/ethnicity, age, and education; Model 2 controls for all variables in Model 1, victimization, and discrimination; Model 3 controls for all variables in Model 2, smoking status, binge drinking, and drug use; and Model 4 controls for all variables in Model 3, BMI, and physical activity

*
 $p < .05$;

**
 $p < .01$;

 $p < .001$;

+
 $p < .10$

Table 3

Odds ratios for sexual orientation differences in hypertension among Women

	Women			
	Model 1 OR (95 % CI)	Model 2 OR (95 % CI)	Model 3 OR (95 % CI)	Model 4 OR (95 % CI)
Sexual orientation (completely heterosexual)				
Gay/mostly gay	0.79 (0.39, 1.61)	0.80 (0.39, 1.62)	0.72 (0.35, 1.46)	0.60 (0.29, 1.20)
Bisexual/mostly heterosexual	0.99 (0.77, 1.27)	1.00 (0.78, 1.28)	0.96 (0.73, 1.26)	0.94 (0.71, 1.23)
Age	1.15 (1.10, 1.22)***	1.16 (1.10, 1.22)***	1.16 (1.10, 1.22)***	1.15 (1.09, 1.21)***
Race/ethnicity (non-Hispanic white)				
Non-Hispanic black	1.65 (1.37, 1.99)***	1.67 (1.37, 2.02)***	1.70 (1.40, 2.07)***	1.41 (1.16, 1.72)***
Hispanic	0.87 (0.58, 1.31)	0.87 (0.58, 1.31)	0.91 (0.60, 1.37)	0.85 (0.56, 1.28)
Asian	0.95 (0.52, 1.74)	0.95 (0.52, 1.73)	0.96 (0.52, 1.77)	1.16 (0.60, 2.24)
Other	1.48 (0.71, 3.08)	1.48 (0.71, 3.01)	1.46 (0.70, 3.04)	1.62 (0.77, 3.44)
Education (college graduate)				
Less than high school	1.44 (0.97, 2.12)	1.46 (0.97, 2.20)	1.30 (0.83, 2.04)	1.09 (0.69, 1.73)
High school graduate	1.41 (1.00, 1.96)*	1.42 (1.01, 2.00)*	1.33 (0.90, 1.95)	0.98 (0.67, 1.45)
Some college	1.22 (0.95, 1.59)	1.23 (0.94, 1.61)	1.18 (0.88, 1.57)	0.97 (0.72, 1.17)
Victimized, previous 12 months		0.95 (0.76, 1.18)	0.92 (0.73, 1.14)	0.93 (0.74, 1.17)
Perceived Discrimination		0.93 (0.73, 1.17)	0.91 (0.71, 1.14)	0.90 (0.70, 1.16)
Smoking (never smoker)				
Current smoker			1.16 (0.87, 1.55)	1.24 (0.89, 1.62)
Former smoker			0.95 (0.76, 1.20)	0.98 (0.76, 1.21)
Missing			1.62 (0.45, 5.84)	2.05 (0.57, 7.39)
Binge drinking, previous 12 months (< 2 times a month)				
2 and < 8 times a month			0.82 (0.65, 1.03)	0.90 (0.70, 1.11)
> 8 times a month			1.28 (0.82, 1.99)	1.61 (1.01, 2.47)*
Drug use, previous 12 months			1.20 (0.97, 1.49) ⁺	1.29 (1.03, 1.63)*
BMI (> 18 and < 25)				
< 18				0.34 (0.09, 1.23)
> 25 and 30				1.97 (1.44, 2.72)***
> 30 and 35				2.78 (2.06, 3.80)***
> 35 and 40				3.46 (2.49, 4.78)***
> 40				5.52 (3.94, 7.85)***
Physical activity level (high)				
Low				1.20 (0.93, 1.58)
Medium				1.04 (0.84, 1.30)

Source Wave IV National Longitudinal Study of Adolescent Health

Analyses are weighted to account for complex survey design

OR odds ratio, *CI* confidence interval; reference category in parentheses; N = 6,750; Model 1 controls for race/ethnicity, age, and education; Model 2 controls for all variables in Model 1, victimization, and discrimination; Model 3 controls for all variables in Model 2, smoking status, binge drinking, and drug use; and Model 4 controls for all variables in Model 3, BMI, and physical activity

*
 $p < .05$;

**
 $p < .01$;

 $p < .001$;

+
 $p < .10$