




ORIGINAL RESEARCH

Statin Use for Atherosclerotic Cardiovascular Disease Prevention Among Sexual Minority Adults

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BACKGROUND: Sexual minority, or lesbian, gay, and bisexual (LGB), individuals are at increased risk for cardiovascular disease attributable to elevated rates of health risk factors. However, although there is clear evidence that statin use can prevent cardiovascular disease in certain adult populations, no studies have examined how statins are being used among the LGB population. This study aimed to examine the prevalence and predictors of statin use among LGB and non-LGB individuals using Facebook-delivered online surveys.

METHODS AND RESULTS: We conducted a cross-sectional online survey about statin use in adults ≥ 40 years of age between September and December 2019 using Facebook advertising ($n=1531$). We calculated the prevalence of statin use by age, sexual orientation, and statin benefit populations. We used multivariable logistic regression to examine whether statin use differed by sexual orientation, adjusting for covariates. We observed a significantly lower rate of statin use in the LGB versus non-LGB respondents (20.8% versus 43.8%; $P<0.001$) in the primary prevention population. However, the prevalence of statin use was not statistically different in the LGB versus non-LGB respondents in the secondary prevention population. Adjusting for the covariates, the LGB participants were less likely to use statins than the non-LGB respondents in the primary prevention population (odds ratio, 0.37; 95% CI, 0.19–0.70).

CONCLUSIONS: Our results are the first to emphasize the urgent need for tailored, evidence-based cardiovascular disease prevention programs that aim to promote statin use, and thus healthy aging, in the LGB population.

Key Words: bisexual ■ gay ■ lesbian ■ sexual orientation ■ social media

Atherosclerotic cardiovascular disease (CVD) is the leading cause of morbidity and mortality in the United States.¹ Although substantial progress has been made in CVD prevention, disparities in CVD outcomes remain in certain population subgroups. For example, sexual and gender minority (SGM) individuals, a health disparity population designated by the National Institutes of Health (NIH),² are at increased risk for CVD events related to elevated rates of health risk factors.^{3,4} Overall, SGM individuals have higher levels of stress related to discrimination and marginalization that has led to health behavioral issues and poor health

outcomes. Prior research has linked stress and mental health issues with chronic diseases, including CVD in sexual minority individuals (eg, those identifying as lesbian, gay, or bisexual [LGB]).^{5–7} Further, the rates of tobacco,^{8,9} alcohol,^{10,11} and drug use,^{11–13} as well as obesity,¹⁴ are elevated in some LGB populations, which also contributes to their higher CVD risk.

As one of the key classes of medications in CVD prevention, statins decrease the risk of cardiovascular events in many randomized clinical trials. Meta-analyses have confirmed that statins significantly decrease cardiovascular morbidity and mortality

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CLINICAL PERSPECTIVE

What Is New?

- Our study is the first to estimate the prevalence of statin use among the lesbian, gay, bisexual (LGB) population.
- We observed that the LGB respondents had significantly lower rates of statin use for primary prevention of cardiovascular diseases compared with the non-LGB respondents.
- We observed that the LGB respondents had similar rates of statin use for secondary prevention of cardiovascular diseases compared with the non-LGB respondents.

What Are the Clinical Implications?

- Our results are the first to emphasize the urgent need for tailored, evidence-based cardiovascular diseases prevention programs that aim to promote statin use, and thus healthy aging, in the sexual and gender minority population.

Nonstandard Abbreviations and Acronyms

ACC	American College of Cardiology
AHA	American Heart Association
BRFSS	Behavioral Risk Factor Surveillance System
LGB	lesbian, gay, and bisexual
MEPS	Medicare Expenditure Panel Survey
NHANES	National Health and Nutrition Examination Survey
NIH	National Institutes of Health
SGM	sexual and gender minority

among older adults with no prior history of CVD (ie, primary prevention).¹⁵ Given the strong evidence on the benefit of statin use, major national and international professional organizations have published guidelines on statin use for CVD prevention.^{16–20} The American College of Cardiology and American Heart Association (ACC/AHA) published recommendations on statin use in the *Guideline on the Treatment of Blood Cholesterol to Reduce Atherosclerotic Cardiovascular Risk in Adults* in 2014.¹⁷ These recommendations were updated in 2018 in *ACC/AHA Multisociety Guideline on the Management of Blood Cholesterol*.²¹ The 2018 guideline recommended statin use for the primary and secondary prevention of CVD for several high-risk groups. For example, adults aged 40 to 75 years with diabetes mellitus are recommended to use a moderate-intensity statin for primary prevention of CVD. Adults <75 years who have clinical CVD are recommended to use a

moderate-intensity statin for secondary prevention of CVD.

Although there is clear evidence that statin use can prevent CVD in older adults, it is unclear how statins are being used among LGB individuals, especially considering their elevated CVD risk. Many recent studies have reported suboptimal statin use among statin-eligible individuals.^{22–27} For instance, using the national representative National Health and Nutrition Examination Survey (NHANES) data, it was reported that just a little over half (58.8%) of the adults aged 40 to 75 years with a diagnosis of diabetes mellitus or dyslipidemia were using statins during 2011 to 2012.²² According to these studies, the prevalence of statin use can be lower than 50% in statin-eligible populations.^{22,23,26,27} It is possible that disparities in statin utilization for CVD in LGB populations also exist because of lower engagement in preventive services.^{28–30} However, information on patterns and determinants of statin use among the LGB population is lacking.

The primary goal of this study was to examine the prevalence and predictors of statin use among middle aged and older LGB and non-LGB individuals using Facebook-delivered online surveys. The use of social media sites, such as Facebook, has dramatically increased over the past decade. It is estimated in 2019 that 72% of US adults have at least one social media account.³¹ Facebook is the most popular social media among adults and older adults in the United States.³¹ About 68% of adults aged 50 to 64 years and 46% of adults >64 years use Facebook,³¹ making it an ideal platform for research targeting older adults. In this study, we collected survey data via Facebook and estimated the prevalence of statin use by age, sexual orientation, and statin benefit populations (primary or secondary prevention of CVD) among US adults aged ≥40 years. We examined whether demographic characteristics, smoking status, and health status were associated with statin use in a multivariable analysis. To our knowledge, this was the first report of the prevalence and predictors of statin use among the SGM population.

METHODS

Study Design

The data that support the findings of this study are available from the first author upon reasonable request. We conducted a cross-sectional online survey between September and December 2019 using Facebook advertising. The survey included questions related to sexual orientation, gender identity, statin use, health status, chronic conditions, smoking status, and other demographic information. We

developed a series of Facebook ads that included an image of a person, a link to our survey in REDcap, and a short descriptive text. Our top performing ads were presented in Figure 1. Facebook ads allowed targeted advertising based on users' location, demographics, and other profile information. We targeted both men and women in all cities in the United States. To oversample sexual and gender minorities, we targeted users with any of the following interests

provided by the Facebook advertisement platform: Grindr, LGBT community, LGBT culture, BuzzFeed LGBT, LGBT Nation, LGBTQ Nation, Online dating service, Pride, Social equality, Scruff, Gay friendly, Gay news, and Gay pride. The respondents did not receive any compensation for completing the survey. The study was approved by the University of Florida Institutional Review Board. Informed consent was obtained from all study participants.

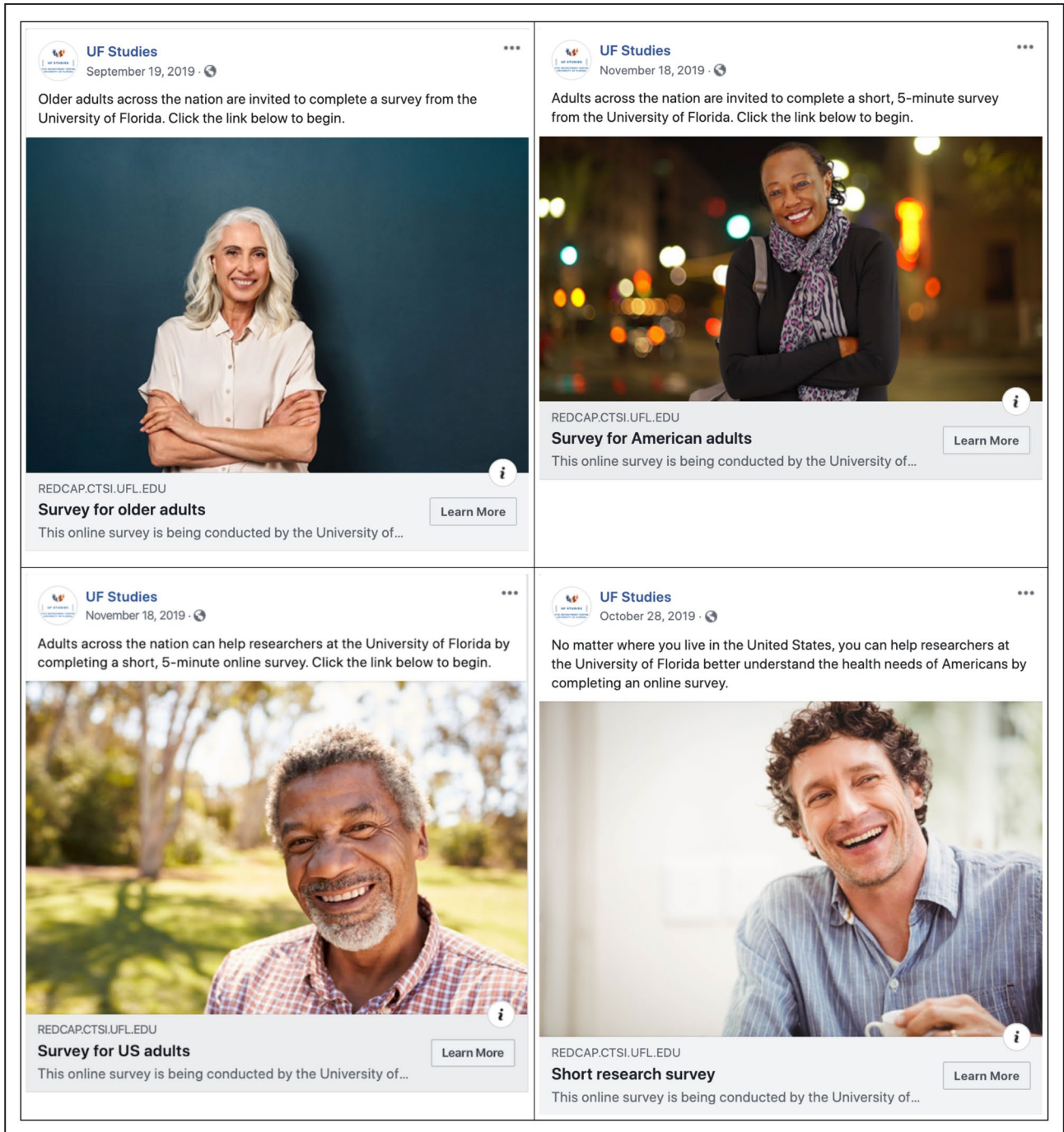


Figure 1. Top performing Facebook Campaign Ads.

Statin Use

The outcome of interest was whether a statin medication was being used for CVD prevention. This was assessed by 2 questions. First, the participants were asked “*Are you currently taking any type of statin medications?*” with the response options *Yes, No, or Not Sure*. To help participants better remember their statin medications, this question was accompanied by a list of brand names of statins currently available in the US market (eg, Lipitor, Lescol, Mevacor) as well as an image of the packages of these statin products. Second, for participants who responded *Yes* to the first question, a follow-up question was asked: “*Are you currently taking statin medications to treat or reduce the chance of following conditions?*” The response options included abnormal blood cholesterol, diabetes, atherosclerosis, high blood pressure, stroke, heart attack, and other cardiovascular diseases. A dichotomous variable was created to indicate statin use specifically for CVD prevention based on responses to these two questions. We examined statin use for the primary and secondary CVD prevention as described in Data Analysis.

Sexual and Gender Minority Status

We measured sexual orientation by asking the question “*Do you consider yourself to be ... ?*” with the following response options: *Heterosexual or straight, Gay, Lesbian, Bisexual, or Not listed above*. We measured gender identity by asking the question “*How do you describe yourself?*” with the following response options: *Male, Female, Trans Male/Trans Man, Trans Female/Trans Woman, Genderqueer/Gender NonConforming, or Different Identity*. We also asked participants to indicate their natal sex with the question “*What sex were you assigned at birth, on your original birth certificate?*” with *female or male* as response options.

Covariates

Covariates included age, race/ethnicity, education level (High school or lower, or More than high school), household income (Less than \$50 000, \$50 000 to under \$100 000, or \$100 000 or more), physical health status, and mental health status, smoking status, and health insurance status. Physical and mental health statuses were measured using 2 questions adopted from the PROMIS® global physical and mental health scales: “*In general, how would you rate your physical health?*” and “*In general, how would you rate your mental health, including your mood and your ability to think?*” The response options for both questions were: *Excellent, Very good, Good, Fair, or Poor*. Current cigarette smoking was operationalized as having ever smoked 100 cigarettes and now smoking cigarettes *every day* or *some days*. Health insurance status included private, Medicaid, Medicare,

others (TRICARE/VA/Military or Alaska Native/Indian Health Service/Tribal Health Services), and no insurance.

Statistical Analysis

In the study cohort, few participants chose a gender identity other than female or male. The number of participants who self-identified as *Trans Male/Trans Man, Trans Female/Trans Woman, Genderqueer/Gender NonConforming, or Different Identity* was 0, 4, 6, and 1, respectively. Therefore, the gender identity variable was excluded from further analysis given the excessive amount of missing values.

Data analysis was conducted in 3 parts. First, we calculated the frequencies and percentages of the variables of interest by sexual orientation to describe our study sample. Differences in these variables by sexual orientation were tested using the chi-squared test or Fisher’s exact test. Second, we calculated the prevalence of statin use by age groups (40–75 and >75 years old) and sexual orientation in our overall cohort, as well as in 2 different statin benefit populations: (1) primary prevention population, defined as survey participants who reported diagnosis of diabetes mellitus or dyslipidemia but no diagnosis of CVD, according to the 2018 ACC/AHA Multisociety Guideline on the Primary Prevention of Cardiovascular Disease; and (2) secondary prevention population, defined as survey participants who reported a CVD diagnosis, including coronary heart disease, heart attack, or stroke. Statin benefit populations that needed risk assessment according to the ACC/AHA Guideline were not considered in this study. Diagnosis history was extracted with the survey question “*Has a doctor, nurse, or other health professional EVER told you that you had...?*” that listed the diseases as responses. Differences in statin use between the non-LGB and LGB subgroups were tested using the chi-squared test or Fisher’s exact test. Lastly, we used multivariable logistic regression to examine whether the differences in sexual orientation were associated with statin use, adjusting for the covariates in these 3 prevention populations. In all regression models, we included and tested sexual orientation-by-covariate interactions. Non-significant interactions ($P>0.05$) were excluded from the models. Results from the regression analysis were reported as odds ratios (ORs) and the associated 95% CIs. All analyses were conducted using SAS version 9.4 (SAS Institute Inc., Cary, NC, USA).

RESULTS

Respondents’ Characteristics

We analyzed data from a total of 1531 respondents ≥ 40 years after excluding 231 respondents with

missing information on age, sex, and sexual orientation. Demographic characteristics of the cohort participants by sexual orientation were summarized in Table 1. Overall, the majority (59.6%) were women and most (90.6%) were non-Hispanic White. The majority had higher than high school education (85.2%), did not smoke (84.7%), and had Excellent/Very good/Good physical (77.6%) or mental (88.2%) health. About household income, 42.2% of the participants reported an income lower than \$50 000, whereas 21.1% reported an income higher than \$100 000. A little over half (53.5%) of the respondents were on Medicare, and about one third (32.3%) of the respondents had private health insurance.

Overall, 187 of the respondents (12.2%) self-identified as LGB, among which 72, 36, and 79 identified as gay, lesbian, and bisexual/other, respectively. The proportion of LGB respondents in our data (12.2%) was higher than the proportion (4.1%) reported in the national Behavioral Risk Factor Surveillance System (BRFSS) survey.³² Compared with the non-LGB participants, a higher proportion of the LGB respondents reported more than high school education (91.8% versus 84.4%; $P=0.012$), less than \$50 000 household income (53.6% versus 40.6%; $P=0.006$), current smoking (21.6% versus 14.5%; $P=0.021$), and Fair/Poor mental health (21.3% versus 10.6%; $P<0.001$). The LGB and non-LGB respondents did not differ in self-reported

Table 1. Respondents' Characteristics

	Overall (N=1531; 100%)	Non-LGB (N=1344; 87.8%)	LGB (N=187; 12.2%)	P value
Age, y				
40–75	1226 (80.1%)	1071 (79.7%)	155 (82.9%)	= 0.330
> 75	305 (19.9%)	273 (20.3%)	32 (17.1%)	
Sex assigned at birth				
Female	912 (59.6%)	818 (60.9%)	94 (50.3%)	= 0.007
Male	619 (40.4%)	526 (39.1%)	93 (49.7%)	
Race/ethnicity				
Non-Hispanic White	1276 (90.6%)	1141 (91.2%)	135 (85.4%)	= 0.008
Non-Hispanic Black	41 (2.9%)	37 (3.0%)	4 (2.5%)	
Non-Hispanic other	58 (4.1%)	50 (4.0%)	8 (5.1%)	
Hispanic	34 (2.4%)	23 (1.8%)	11 (7.0%)	
Education				
≤ High school	210 (14.8%)	197 (15.6%)	13 (8.2%)	= 0.012
> high school	1212 (85.2%)	1066 (84.4%)	146 (91.8%)	
Household income				
<\$50 000	545 (42.2%)	462 (40.6%)	83 (53.6%)	= 0.006
\$50 000 to <\$100 000	475 (36.8%)	433 (38.1%)	42 (27.1%)	
≥\$100 000	272 (21.1%)	242 (21.3%)	30 (19.4%)	
Physical health				
Fair/Poor	335 (22.4%)	299 (22.4%)	36 (21.9%)	= 0.999
Excellent/Very good/Good	1163 (77.6%)	1035 (77.5%)	128 (78.1%)	
Mental health				
Fair/Poor	176 (11.8%)	141 (10.6%)	35 (21.3%)	< 0.001
Excellent/Very good/Good	1316 (88.2%)	1187 (89.4%)	129 (78.7%)	
Current smoker				
Yes	222 (15.3%)	187 (14.5%)	35 (21.6%)	= 0.021
No	1231 (84.7%)	1104 (85.5%)	127 (78.4%)	
Insurance				
Private	449 (32.3%)	389 (31.5%)	60 (38.2%)	= 0.008
Medicaid	60 (4.3%)	46 (3.7%)	14 (8.9%)	
Medicare	744 (53.5%)	673 (54.5%)	71 (45.2%)	
Others	96 (6.9%)	88 (7.1%)	8 (5.1%)	
No insurance	42 (3.0%)	38 (3.1%)	4 (2.6%)	

LGB indicates lesbian, gay, or bisexual.

physical health ($P=0.999$). Further, the LGB and non-LGB respondents had different health insurance status ($P=0.008$). The LGB respondents were slightly more likely to have private insurance (38.2% versus 31.5%), but significantly more likely to be on Medicaid (8.9% versus 3.7%) and less likely to be on Medicare (45.2% versus 54.5%).

Prevalence of Statin Use by Age, Sexual Orientation, and Population

The prevalence rates of statin use by age and sexual orientation in each of the 3 populations are summarized in Figure 2. The frequencies and prevalence rates of statin use for the LGB subgroups are summarized in Table S1. In our study cohort, approximately a third (31.6%) were currently taking statins. A lower rate of statin use was observed in the LGB respondents compared with the non-LGB respondents (20.9% versus 33.1%; $P<0.001$). The overall prevalence of statin use increased from 29.8% among the 40 to 75 year-olds to 39.0% among the >75 year-olds. In both age groups, the LGB respondents had a significantly lower rate of statin use than the non-LGB respondents. The prevalence of statin use was 21.3% and 31.0% in the LGB and non-LGB respondents ($P=0.014$), respectively, among the 40 to 75 year-olds; and the prevalence was 21.3% and 31.0% in the LGB and non-LGB respondents ($P=0.013$), respectively, among the >75 year-olds. In the LGB subgroups, the overall prevalence of statin use was similar among the gay (23.6%) and lesbian (25.0%) respondents, but was lower, although statistically non-significant ($P=0.423$), among the bisexual/other respondents (16.5%). A similar trend in statin use was observed among the LGB subgroups in the 40 to 75 year-olds, but not in the >75 year-olds because of small sample sizes.

In the primary prevention population, the overall prevalence of statin use was 39.6%, which is higher than that in the overall population. Similarly, we observed a significantly lower rate of statin use in the LGB respondents compared with the non-LGB respondents (20.8% versus 43.8%; $P<0.001$). We observed a slight decrease in the prevalence of statin use with age, dropping from 40.1% among the 40 to 75 year-olds to 37.5% among >75 year-olds. In both age groups, the LGB respondents had a significantly lower rate of statin use than the non-LGB respondents. The prevalence of statin use was 22.7% and 43.4% in the LGB and non-LGB respondents ($P<0.001$), respectively, among the 40 to 75 year-olds; and the prevalence was 15.4% and 45.7% in the LGB and non-LGB respondents ($P=0.008$), respectively, among >75 year-olds. In the LGB subgroups, the overall prevalence of statin use was slightly higher in the lesbian (30.8%) than gay (26.2%) respondents, but it was lower, although

statistically non-significant ($P=0.259$), among the bisexual/other respondents (13.0%).

In the secondary prevention population, the overall prevalence of statin use was 57.5%, which is significantly higher than that in the overall (31.6%) or primary prevention (37.9%) population. However, we did not observe a significant difference in the prevalence of statin use among the LGB versus non-LGB respondents (57.1% versus 57.5%; $P=0.999$). Further, sample sizes were too small to identify any difference in statin use among the LGB subgroups.

Association of Sexual Orientation With Statin Use in Multivariable Analysis

We summarized results from the multivariable logistic regressions in Table 2. None of the sexual orientation-by-covariate interactions were significant in the regression analysis, and thus, ORs and 95% CIs were reported for model main effects only. Adjusting for the covariates, the LGB participants were less likely to use statins than the non-LGB respondents in the overall (OR, 0.62; CI, 0.41 – 0.94) and primary prevention (OR, 0.37; CI, 0.19 – 0.70) populations. However, sexual orientation was not a significant predictor of statin use in the secondary prevention population.

About the covariates, men were significantly more likely to use statins than women in the overall population only. Compared with non-White respondents, White respondents were significantly more likely to use statins in the overall and primary prevention populations. Further, having more than high school education was significantly associated with a higher rate of statin use in the overall and secondary prevention populations, but this relationship was non-significant in the primary prevention population. Household income, current smoking status, physical health, and mental health did not associate with statin use in any of the 3 populations. Lastly, compared with respondents with no health insurance or Medicaid, respondents with private insurance, Medicare, or other insurance were significantly more likely to use statins in the overall and primary prevention populations. The insurance effect was not estimable in the secondary prevention population because of small sample sizes.

DISCUSSION

To our knowledge, this study is the first to estimate the prevalence of statin use among the SGM population. We observed that the LGB respondents had significantly lower rates of statin use for the primary prevention of CVD compared with the non-LGB respondents. However, the prevalence of statin use for secondary prevention of CVD was similar in the LGB

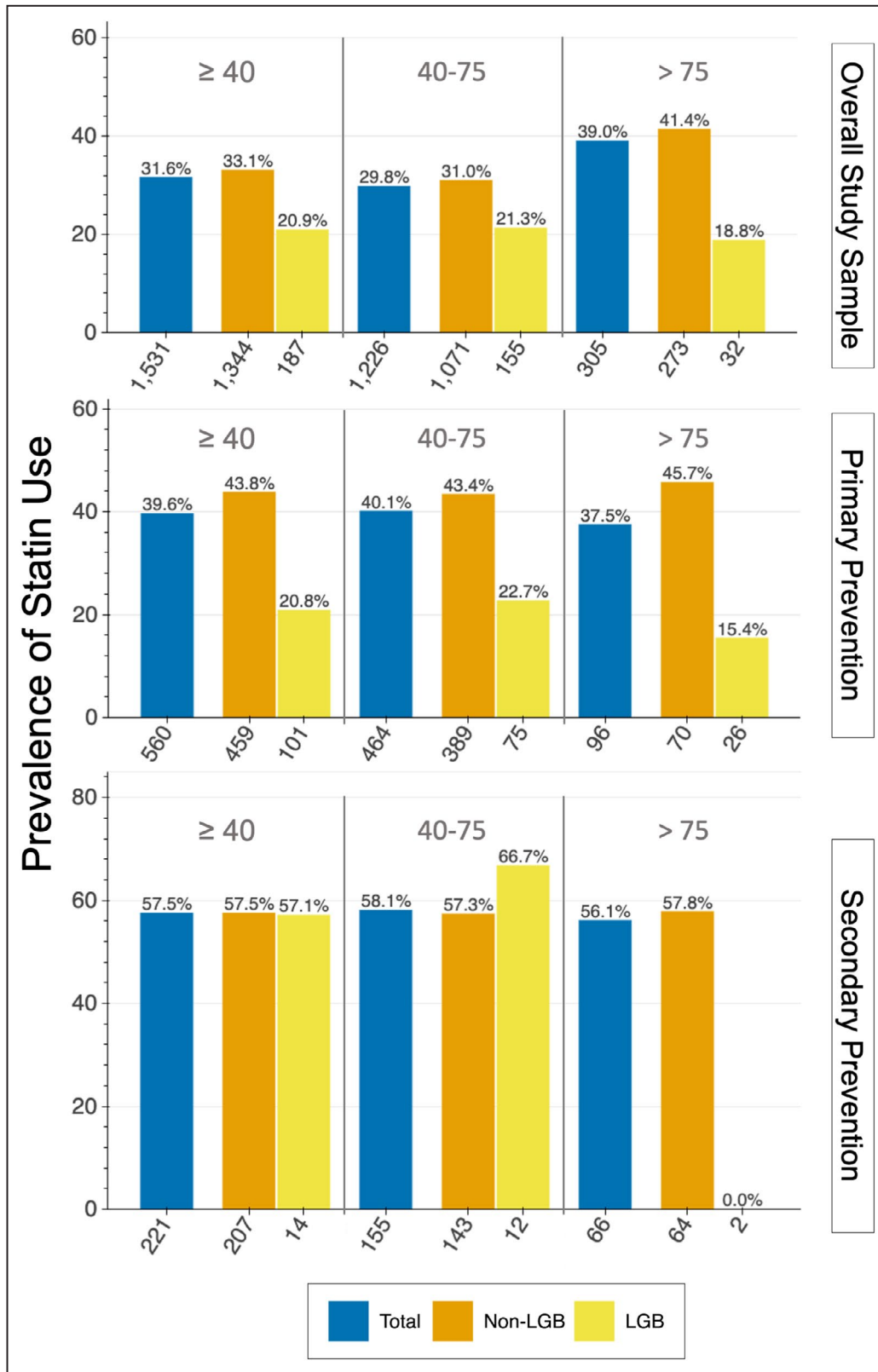


Figure 2. Statin Use by Age, Sexual Orientation, and Population. The prevalence of statin use stratified by prevention population (overall, primary prevention, and secondary prevention), age group (≥ 40 , 40 to 75, and >75), and sexual orientation (LGB vs non-LGB). LGB indicates lesbian, gay, or bisexual.

Table 2. Odds Ratios for Predicting Statin Use in Multivariable Logistic Regression

Predictors	Population		
	Overall	Primary Prevention	Secondary Prevention
	OR (95% CI)	OR (95% CI)	OR (95% CI)
Sexual orientation			
LGB vs non-LGB	0.62 (0.41–0.94)	0.37 (0.19–0.70)	3.96 (0.45–35.2)
Age, y			
Age >75 vs Age 40–75	1.43 (1.05–1.93)	0.65 (0.36–1.19)	1.14 (0.53–2.44)
Sex			
Male vs Female	1.73 (1.35–2.21)	1.07 (0.65–1.76)	1.82 (0.94–3.55)
Race			
White vs Non-White	3.24 (1.87–5.62)	3.72 (1.39–9.95)	4.23 (0.70–25.4)
Education			
Some college or higher vs High school or lower	1.63 (1.12–2.37)	1.28 (0.61–2.71)	2.40 (1.07–5.38)
Income			
\$50 000 to <\$100 000 vs <\$50 000	0.96 (0.72–1.28)	1.24 (0.71–2.19)	1.86 (0.89–3.89)
≥\$100 000 vs <\$50 000	1.07 (0.77–1.50)	1.27 (0.63–2.55)	2.22 (0.78–6.34)
Physical health			
Excellent/Very good/Good vs Fair/Poor	0.84 (0.61–1.14)	0.85 (0.48–1.48)	1.57 (0.77–3.18)
Mental health			
Excellent/Very good/Good vs Fair/Poor	1.38 (0.90–2.12)	0.53 (0.23–1.21)	0.57 (0.16–2.03)
Current smoke			
Yes or No	0.86 (0.60–1.24)	1.17 (0.53–2.57)	0.91 (0.36–2.30)
Insurance			
Private/Medicare/Others vs No insurance/Medicaid	3.12 (1.64–5.93)	3.33 (1.15–9.70)	NA*

LGB indicates lesbian, gay, or bisexual; and OR, odds ratio.

*The insurance effect was not estimable in this model because of small cell sizes.

and non-LGB respondents. Further, our multivariable analysis showed that the differences in statin use between the LGB and non-LGB respondents were likely to be independent of demographics, education, income, smoking status, health status, and health insurance status.

Prior studies have documented a suboptimal use of statins in many statin-eligible population subgroups. Our estimated prevalence of statin use for primary prevention of CVD in both the LGB and non-LGB populations was consistently lower than the reported “suboptimal” rates in the literature.^{22–27} In one study using the 2011–2012 NHANES data, 58.8% of the adults aged 40 to 75 years with a diagnosis of diabetes mellitus or dyslipidemia were using statins.²² In another study using the 2014–2015 Medicare Expenditure Panel Survey (MEPS) data, it was estimated that the rate of statin use was between 57.52% to 67.14% across the race groups among patients with diabetes mellitus aged 40 to 75 years.²⁴ Our estimated

prevalence of statin use for primary prevention of CVD was 22.7% and 43.4% in the LGB and non-LGB individual respondents aged 40 to 75 years, which is lower than the “suboptimal” rates reported in these studies.

On the other hand, our estimated prevalence rates of statin use for secondary prevention of CVD are mostly comparable to those reported elsewhere.^{33–35} One study using MEPS data, estimated that 59.4% of patients aged ≥40 years with a history of CVD were using statins between 2014 and 2016, after the ACC/AHA guideline on statin use for CVD prevention was published.³³ This rate is similar to our estimated rates among the secondary prevention-eligible LGB (57.1%) and non-LGB (57.5%) individuals of the same age. In the same study, it was also reported that the prevalence of statin use among patients with CVD aged 40 to 75 years and ≥75 years was 58.3% and 62.3%, respectively. Their estimated prevalence in patients aged 40 to 75 (58.3%) is close to our estimation of 58.1% in the same age group (57.3% and

66.7% in non-LGB and LGB individuals, respectively). However, there is larger difference in the prevalence of statin use found in those aged ≥ 75 years, probably because of unstable rate estimation in our respondents caused by small sample sizes in this age group.

Our study suggests that LGB individuals have significantly lower rates of statin use for primary prevention of CVD compared with their non-LGB peers. This disparity in statin use partially reflects the differences in health behaviors between the 2 groups. It has been indicated that health behaviors, such as health-care utilization, play an important role in predicting statin use among statin-eligible individuals. One prior study showed that, among patients with diabetes mellitus aged between 40 and 75 years, those who had more than 1 medical visit in the past year were significantly more likely to use statins compared with those who had zero or only a single medical visit.²³ In another study of patients with severe dyslipidemia, having usual visits to doctor's office was the most impactful predictor of hypercholesterolemia awareness and being on a statin treatment.³⁵ However, LGB individuals are less likely than non-LGB individuals to have regular doctor visits, which has led to the lower prevalence of statin use among this population.^{28–30} Nonetheless, the literature on factors associated with statin use have mostly focused on demographic and clinical characteristics. More future studies are needed to explore how behavioral factors, such as awareness and acceptance, impact healthcare utilization and statin use in the SGM population.

Our results about the covariates in the multivariable analysis showed some of the same statin use patterns as those previously reported. For example, women were less likely to use statins for secondary prevention of CVD than men,^{33,34} while the sex difference in statin use was non-significant in many of the primary prevention studies.^{22,24,27} The other race-ethnic groups were less likely to use statin for CVD prevention compared with Non-Hispanic Whites in many, but not all, of the studies.^{22,24–26} Further, higher levels of education and income were shown to be predictive of statin use in a few studies,^{22,33} but non-significant in others.^{23–25,35} Overall, none of these factors were consistent predictors of statin use, although some patterns are more prevalent than others in the literature.

Strengths and Limitations

Our study has many strengths, the most important of which being that it is the first to identify an important health-related disparity of statin use among the SGM population. If confirmed, it would signal a new target population for improved education related to the need for an important prevention medication.

There are some limitations that should be noted. First, we recruited a convenient sample that may not accurately represent the intended population. The respondents' thoughts about Facebook will also likely have impacted their responses. However, since no studies have reported on the prevalence of statin use in the SGM population, our study provides important initial data for future research. Second, like all survey research, our results are based on self-reported measures, such as history of diagnoses, that are known to be subject to recall bias. Third, because of the small sample size of LGB participants, tests for interactions in the multivariable analysis were likely underpowered. Fourth, we were unable to prevent an individual from taking the survey more than once. However, the respondents were not compensated for their participation, which should have greatly reduced the chance of multiple submissions from the same person. Finally, many people may not consider it socially acceptable to disclose their use of medications.

CONCLUSIONS

Although at elevated CVD risk, LGB individuals appear to have significantly lower rates of statin use for primary prevention of CVD compared with their non-LGB peers. Our results are the first to emphasize the urgent need for tailored, evidence-based CVD prevention programs that aim to promote statin use, and thus healthy aging, in the SGM population.

ARTICLE INFORMATION

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None.

Supplementary Material

Table S1

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SUPPLEMENTAL MATERIAL

Table S1. Statin use by age and sexual orientation.

Population	Age	Sexual orientation	Statin use		<i>p</i> -value
			Yes	No	
Overall study sample	≥ 40	Total	484 (31.6%)	1,047 (68.4%)	< 0.001
		Non-LGB	445 (33.1%)	899 (66.9%)	
	LGB	39 (20.9%)	148 (79.1%)		
	Gay	17 (23.6%)	55 (76.4%)		
	Lesbian	9 (25.0%)	27 (75.0%)		
	Bisexual/Other	13 (16.5%)	66 (83.5%)		
	(N=1,531)				
40-75	(N=1,226)	Total	365 (29.8%)	861 (70.2%)	= 0.014
		Non-LGB	332 (31.0%)	739 (69.0%)	
	LGB	33 (21.3%)	122 (78.7%)		
	Gay	15 (26.3%)	42 (73.7%)		
	Lesbian	8 (25.0%)	24 (75.0%)		
	Bisexual/Other	10 (15.2%)	56 (84.9%)		

	>75	Total	119 (39.0%)	186 (61.0%)	
	(N=305)	Non-LGB	113 (41.4%)	160 (58.6%)	= 0.013
		LGB	6 (18.8%)	26 (81.3%)	
		Gay	2 (13.3%)	13 (86.7%)	
		Lesbian	1 (25.0%)	3 (75.0%)	
		Bisexual/Other	3 (23.1%)	10 (76.9%)	
Primary prevention	≥ 40	Total	222 (39.6%)	338 (60.4%)	
	(N=560)	Non-LGB	201 (43.8%)	258 (56.2%)	< 0.001
		LGB	21 (20.8%)	80 (79.2%)	
		Gay	11 (26.2%)	31 (73.8%)	
		Lesbian	4 (30.8%)	9 (69.2%)	
		Bisexual/Other	6 (13.0%)	40 (87.0%)	
	40-75	Total	186 (40.1%)	278 (59.9%)	
	(N=464)	Non-LGB	169 (43.4%)	220 (56.6%)	< 0.001
		LGB	17 (22.7%)	58 (77.3%)	

		Gay	10 (31.3%)	22 (68.8%)	
		Lesbian	3 (33.3%)	6 (66.7%)	
		Bisexual/Other	4 (11.8%)	30 (88.2%)	
	>75	Total	36 (37.5%)	60 (62.5%)	
	(N=96)	Non-LGB	32 (45.7%)	38 (54.3%)	=
		LGB	4 (15.4%)	22 (84.6%)	0.008
		Gay	1 (10.0%)	9 (90.0%)	
		Lesbian	1 (25.0%)	3 (75.0%)	
		Bisexual/Other	2 (16.7%)	10 (83.3%)	
Secondary prevention	≥ 40	Total	127 (57.5%)	94 (42.5%)	
	(N=221)	Non-LGB	119 (57.5%)	88 (42.5%)	= 0.999
		LGB	8 (57.1%)	6 (42.9%)	
		Gay	3 (42.9%)	4 (57.1%)	
		Lesbian	1 (50.0%)	1 (50.0%)	
		Bisexual/Other	4 (80.0%)	1 (20.0%)	
	40-75	Total	90 (58.1%)	65 (41.9%)	
	(N=155)	Non-LGB	82 (57.3%)	61 (42.7%)	= 0.762

		LGB	8 (66.7%)	4 (33.3%)	
		Gay	3 (60.0%)	2 (40.0%)	
		Lesbian	1 (50.0%)	1 (50.0%)	
		Bisexual/Other	4 (80.0%)	1 (20.0%)	
	>75	Total	37 (56.1%)	29 (43.9%)	
	(N=66)	Non-LGB	37 (57.8%)	27 (42.2%)	= 0.189
		LGB	0 (0.00%)	2 (100%)	
		Gay	-	-	
		Lesbian	0 (0.00%)	2 (100%)	