

Patterns of Cigarette Smoking and Alcohol Use Among Lesbians and Bisexual Women Enrolled in a Large Health Maintenance Organization

ABSTRACT

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Objectives. This study compared the prevalence of cigarette smoking and alcohol use among lesbians and bisexual women with that among heterosexual women.

Methods. Logistic regression models were created with data from an extensive member health survey at a large health maintenance organization. Sexual orientation was the primary predictor, and alcohol consumption and cigarette smoking were outcomes.

Results. Lesbians and bisexual women younger than 50 years were more likely than heterosexual women to smoke cigarettes and drink heavily. Lesbians and bisexual women aged 20 to 34 reported higher weekly alcohol consumption and less abstinence compared with heterosexual women and older lesbians and bisexual women.

Conclusions. Lesbians and bisexual women aged 20 to 34 years are at risk for alcohol use and cigarette smoking. (*Am J Public Health.* 2001;91:976–979)

Some research has suggested that lesbians and bisexual women are more likely to drink alcohol heavily and to smoke cigarettes than are heterosexual women,^{1–6} whereas other research has showed no significant differences.^{7–13}

Research published before 2000 on the prevalence of alcohol consumption and cigarette smoking among lesbians and bisexual women was based primarily on small, homogeneous convenience samples recruited from the lesbian and bisexual communities, and the findings therefore have had limited generalizability. In 2000, 4 published population-based studies investigating alcohol use and smoking indicated that lesbians and bisexual women were more likely to drink heavily and smoke cigarettes than were heterosexual women. The results on levels of abstinence from drinking were mixed.^{2–5}

The current analysis of a health maintenance organization member health survey adds to the literature in several ways. First, the sampling for this study of Kaiser Permanente Medical Care Program, Northern California Region, members was population based. Second, we stratified the analyses by age. Finally, we controlled for depression and stress, along with sociodemographic characteristics, in the multivariate models.

Methods

Study Population

This analysis used data from a 1996 general health survey of Kaiser Permanente members. The survey was mailed to a random sample of 34 000 members at least 20 years of age who had been Kaiser Permanente members for at least 3 months. The sample was stratified by medical center service population (composed of 17 Kaiser Permanente medical centers), 3 age groups (20–44, 45–64, ≥65 years), and sex.

Data Collection

The full survey was first mailed in April 1996. Nonrespondents were sent a reminder postcard and 2 additional surveys. The final mailing included a shortened version of the

survey to increase the response rate. The survey was approved by Kaiser Permanente's institutional review board. For this study, only data on women were used.

The self-administered 8-page survey took approximately 20 minutes to complete. The questions covered sociodemographic characteristics, health and functional status, health care use, satisfaction with care, and health-related behaviors. The main independent variable was worded as follows: "What is your sexual orientation (1) Heterosexual ('straight'), (2) Homosexual (gay, lesbian) or bisexual, (3) Transsexual."

Statistical Analysis

Chi-square tests were used to compare the sociodemographic characteristics of the lesbians and bisexual women and heterosexual women to determine the covariates for inclusion in the multivariate models (e.g., age, race/ethnicity, education level, stress, depression). Chi-square tests also were used to compare the differences in smoking status, heavy drinking, and abstinence from drinking between lesbians and bisexual women and heterosexual women in 3 different age groups (20–34 years, 35–49 years, ≥50 years). Fisher exact tests were used when appropriate.

Five multivariate logistic regression models were built to predict current smoking status and heavy drinking for each age group. We did not build logistic regression models to predict heavy drinking in the oldest age group and abstinence in any age category because of empty cells.

Current smoking status was defined as a response of "smoke now," and heavy drinking

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was defined as drinking either more than 4 drinks per episode or more than 20 drinks per week over the past year. Sexual orientation (lesbian and bisexual vs heterosexual) was the primary predictor variable. Other covariates included race/ethnicity, education level, stress, and depression. The questionnaire item relating to stress was worded as follows: "During the past 12 months, how often have you felt very stressed, tense, or anxious? All of the time, most of the time, a little of the time, never." Women were considered "depressed" if they answered yes to either of the following 2 questions: "During the past 12 months, did you have depression/extreme sadness?" and "Over the past 12 months, were you on prescription medication for depression?" Covariates with a *P* value of less than .10 in bivariate analyses were included. Odds ratios and 95% confidence intervals were calculated for each model.

To assess the frequency and amount of alcohol consumption, we conducted multivariate analyses of covariance (for each age group), with weekly alcohol consumption as the outcome variable and race/ethnicity, education, stress, and depression as covariates. We treated the 6-category outcome as continuous.

Results

Sociodemographics

The overall response rate for the female members of the 1996 member health survey was 57.6% (*N*=9665). An additional 10.2% of the women were excluded because they filled out the "short form" of the questionnaire, which did not include the question on sexual orientation; 6.5% of the women were excluded because they did not answer the question on sexual orientation. The final response rate for these analyses was 48.4%.

Of the women responding to the question on sexual orientation (*n*=8113), 120 (1.5%) reported being lesbian or bisexual. The les-

bians and bisexual women were significantly younger than the heterosexual women (mean age=43.0 years vs 51.4 years, *P*<.001) and more highly educated (college or graduate education=50.8% vs 30.5%, *P*<.001) than the heterosexual women. The lesbians and bisexual women also were significantly more likely than the heterosexual women to report high levels of stress (19.5% vs 13.0%, *P*=.02) and depression (28.3% vs 16.3%, *P*<.001). No statistically significant differences in race/ethnicity were found between groups (White, non-Latina=79.2% vs 73.7%, *P*=.3).

Alcohol and Tobacco Use

Table 1 shows the prevalence of current cigarette smoking, heavy drinking, and abstinence from drinking, by age. Overall, the lesbians and bisexual women had significantly higher rates of heavy drinking than did the heterosexual women. Analyses stratified by age indicated that the lesbians and bisexual women in the younger and middle age categories were more likely to smoke and drink heavily than were the heterosexual women. The lesbians and bisexual women in the youngest age category were less likely to report being abstinent from alcohol than were the heterosexual women.

The percentage of the lesbians and bisexual women who met criteria for heavy drinking declined significantly from 23.3% in the 20-to-34 age group to 7.1% in the 35-to-49 age group; no heavy drinkers were identified in the oldest category of lesbians and bisexual women. The percentage of the lesbians and bisexual women who were abstinent increased significantly from 0% in the 20-to-34 age group to 24.5% in the 35-to-49 age group and 29.4% in the oldest age group.

Table 2 shows the results from the multivariate logistic regression analyses. After education, race/ethnicity, stress, and depression were controlled for, lesbians and bisexual women aged 20 to 34 years and 35 to 49 years

were found more likely to be current smokers and heavy drinkers than were heterosexual women.

The analysis of covariance found that lesbians and bisexual women between ages 20 and 34 years reported higher weekly alcohol consumption than did heterosexual women (*P*<.001), but no significant differences were found between the lesbians and bisexual women and heterosexual women in the 35-to-49 and 50-or-older age groups (*P*=.19 and *P*=.47, respectively).

Discussion

Our investigation shows the importance of age in understanding the differences and similarities in alcohol use and smoking among lesbians and bisexual women and heterosexual women. Unlike previous research suggesting that rates of heavy drinking among lesbians remain higher than rates among heterosexual women over time,⁶ our results indicate that patterns of alcohol consumption and cigarette smoking for lesbians and bisexual women are not uniform across age groups. The rates for heavy drinking, higher weekly alcohol consumption, cigarette smoking, and lack of abstinence were most pronounced among lesbians and bisexual women aged 20 to 34, but these rates decreased dramatically among those aged 34 to 49 years. None of the lesbians and bisexual women older than 50 years met criteria for heavy drinking; these rates are comparable to those of both the heterosexual women in our study and the older women in the general population.¹⁴

By examining different age groups in a sample of lesbians and bisexual women and heterosexual women, our study overcame many of the limitations of past investigations.^{3,4} Our overall patterns for alcohol use and smoking among lesbians and bisexual women are comparable to those reported in recent population-based research.^{3,4} To our knowledge, only 1 other study has examined sexual orientation as a predictor

TABLE 1—Cigarette Smoking and Alcohol Consumption, by Sexual Orientation and Age

	Current Smokers			Heavy Drinkers ^a			Abstinence From Drinking		
	L/B	H	χ^2	L/B	H	χ^2	L/B	H	χ^2
Overall	25.4%	12.6%	<i>P</i> <.001	9.2%	2.6%	<i>P</i> <.001	19.8%	32.5%	<i>P</i> =.004
Age, y									
20-34	33.3%	13.2%	<i>P</i> <.001	23.3%	6.0%	<i>P</i> <.001	0%	27.7%	<i>P</i> <.001
35-49	29.1%	14.4%	<i>P</i> =.002	7.1%	2.7%	<i>P</i> <.001	24.5%	27.9%	<i>P</i> =.59
≥50	12.1%	11.3%	<i>P</i> =.89	0%	1.3%	<i>P</i> =.50	29.4%	37.0%	<i>P</i> =.36
χ^2 20-34 vs 35-49	<i>P</i> =.69	<i>P</i> =.27		<i>P</i> =.03	<i>P</i> <.001		<i>P</i> <.01	<i>P</i> =.89	
χ^2 20-34 vs ≥50	<i>P</i> =.04	<i>P</i> =.06		<i>P</i> =.003	<i>P</i> <.001		<i>P</i> <.001	<i>P</i> <.001	
χ^2 35-49 vs ≥50	<i>P</i> =.07	<i>P</i> <.001		<i>P</i> =.11	<i>P</i> <.001		<i>P</i> =.61	<i>P</i> <.001	

Note. L/B=lesbian and bisexual women; H=heterosexual women.

^aMore than 4 drinks per episode or more than 20 drinks per week over the past year.

TABLE 2—Risk Factors for Current Smokers and Heavy Drinkers, by Age: Results of Multivariate Logistic Regression Analyses

Risk Factor	Current Smoking			Heavy Drinking	
	20–34 y OR (95% CI)	35–49 y OR (95% CI)	≥50 y OR (95% CI)	20–34 y OR (95% CI)	35–49 y OR (95% CI)
Sexual orientation					
Lesbian/bisexual	3.2 (1.4, 7.3)	3.4 (1.8, 6.5)	1.3 (0.4, 3.6)	4.6 (1.9, 11.4)	2.9 (1.0, 8.6)
Heterosexual	1.0	1.0	1.0	1.0	1.0
Education					
College degree/graduate degree	0.3 (0.2, 0.5)	0.2 (0.2, 0.3)	0.5 (0.4, 0.7)	0.3 (0.2, 0.5)	0.5 (0.3, 0.9)
<College degree	1.0	1.0	1.0	1.0	1.0
Race/ethnicity					
White, non-Latina	1.8 (1.3, 2.4)	1.5 (1.2, 2.0)	1.3 (1.0, 1.7)	1.2 (0.8, 1.8)	2.0 (1.0, 3.8)
Women of color	1.0	1.0	1.0	1.0	1.0
Stress					
High	1.6 (1.0, 2.5)	1.7 (1.2, 2.4)	1.5 (1.0, 2.1)	1.2 (0.6, 2.2)	1.9 (0.9, 4.2)
Moderate	1.3 (0.9, 1.9)	1.1 (0.8, 1.4)	1.1 (0.9, 1.4)	1.1 (0.7, 1.9)	1.7 (0.9, 3.2)
Low or none	1.0	1.0	1.0	1.0	1.0
Depression					
Depression in past 12 mo	1.6 (1.1, 2.4)	1.6 (1.2, 2.1)	1.2 (0.9, 1.7)	1.9 (1.2, 3.3)	2.0 (1.1, 3.5)
No depression in past 12 mo	1.0	1.0	1.0	1.0	1.0
No. of observations	1526	2351	3920	1551	2381

Note. OR=odds ratio; CI=confidence interval.

of alcohol use within specific age groups.² Valanis et al.² found that lesbians and bisexual women older than 50 drank heavily compared with heterosexual women, but they defined heavy drinking as more than 7 drinks per week, whereas we used stricter criteria. In addition to our findings on age, the current research uniquely contributes to the literature by showing that sexual orientation is associated with smoking and alcohol consumption independent of the effects of stress, depression, and sociodemographic variables.

Although data are sparse as to the underlying factors for the higher rates of alcohol use and cigarette smoking among lesbians and bisexual women, preliminary data suggest that stress, depression, socialization, and cultural factors, as well as external and internalized homophobia and heterosexism, may account for these patterns.^{8,14,15} One potential factor is that younger lesbians and bisexual women may be more likely than older lesbians and bisexual women to participate in the lesbian “bar culture” as a primary means of socialization.¹⁵ Furthermore, younger lesbians and bisexual women might be more likely than their elders to cope with the stress resulting directly from homophobia and heterosexism by smoking, drinking heavily, or both. Finally, lesbians and bisexual women may respond to all of the above stress factors with depressive and anxiety illnesses, which may correlate with smoking cigarettes and alcohol use. Our data lend support to further examination of the relation between stress, depression, and substance use for lesbians and bisexual women, which may help in tailoring clinical interventions and services for this population.

Despite finding that younger lesbians and bisexual women report higher rates of alcohol use and cigarette smoking, our data underscore that only a minority of lesbians and bisexual women report heavy alcohol use. Most lesbians and bisexual women do not show problematic alcohol use.

Limitations and Strengths

One important limitation of this study was the 48% response rate. Sensitive questions about health risk behaviors or sexuality may have generated nonresponse bias. However, the survey indicated that women’s responses would not be connected to their medical records, be reported to their providers, or affect their health care. Furthermore, the sexual orientation question was at the end of the questionnaire and was “optional,” giving the women “permission” to leave this question blank.

Nonrespondents to the sexual orientation question were more likely to be older, be women of color, and have lower levels of education than lesbians and bisexual women and heterosexual women independently.¹⁶ They also were more likely not to respond to the question on income. Nonrespondents were less likely than heterosexual women and lesbians and bisexual women to be heavy drinkers and current smokers and more likely to be abstinent. It is unclear whether nonrespondents were less likely to have these health behaviors or were more likely to report socially acceptable answers.

Another limitation may lie in the measurement of key variables. Our questions on

stress and depression were not standardized and may not have resulted in accurate evaluation. Also, the sexual orientation question did not assess sexual behavior or attraction. Although the question may have captured only women who self-identify as lesbians or bisexual women, prior research has reported consistent patterns of same-sex attraction, behavior, and identity.¹⁷

Although the proportion of lesbians and bisexual women in our sample (1.5%) was similar to proportions reported in other population-based research,^{2–4} our small sample size prohibited analyses for racial/ethnic minorities. For this reason, our data may not generalize well to lesbians and bisexual women of color. Future research should use oversampling methods to increase diversity and to allow for analysis of lesbians and bisexual women of color.

Finally, it is unclear how well the membership of the Kaiser Permanente Medical Care Program, Northern California Region, represents the overall population of northern California. Research suggests that Kaiser Permanente members are less likely to be unemployed or living in poverty compared with the general population.¹⁸ Also, all members have health insurance or Medicaid. As a result, our findings may be limited in their generalizability to non-indigent populations of women.

Despite these limitations, our population-based data hold some important clinical implications. This study identified lesbians and bisexual women aged 20 to 34 years as an at-risk group for substance abuse, highlighting the need for further research on the etiology of alcohol use and cigarette smoking in younger

lesbians and bisexual women. Additional research on older lesbians and bisexual women may help delineate protective factors for substance use, which can then be used to develop culturally appropriate interventions for this community. □

Contributors

E. P. Gruskin was the principal investigator on the project and prepared the manuscript. S. Hart assisted with the final analyses for the project and with manuscript preparation. N. Gordon collected the data for the project and assisted with manuscript preparation. L. Ackerson provided statistical consultation for the project and assisted with manuscript preparation.

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