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ORIGINAL PAPER

Health Disparities Among Sexual Gender Minority Women in the United States: A Population-Based Study

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Abstract

There is a paucity of population-based research to identify health disparities experienced by sexual gender minority (SGM) women. The purpose of this study was to use a population-based data set to understand disparities in access to healthcare, preventive care, and health risk behaviors of lesbian and bisexual women compared to their straight counterparts and to each other. This was a cross-sectional study using the 2016 Behavioral Risk Factor Surveillance System data. SPSS with complex samples was used to calculate weighted descriptive statistics. Logistic regression was used to calculate odds and adjusted odds ratios. 9016 women were included in the analyses. Women who identified as lesbian were more likely to be from a minority group. Bisexual women were more likely to be in the younger age groups and were less likely to be college graduates or report a higher income. Lesbian and bisexual women were more likely to report depression, smoking, and heavy/binge drinking compared to straight women. They were also less likely to have received a pap test. Compare to lesbian women, bisexual women were more likely to report depression and poorer health. SGM women are at greater risk of depression and risky coping behaviors such as smoking and heavy/binge drinking. Within the SGM subgroup, bisexual women have a higher risk for depression and worse general health. Health promotion programs and interventions must be tailored to account for the unique stressors SGM women encounter and associated negative health outcomes.

Keywords Sexual gender minority · Health disparities · Lesbian and bisexual women's health · Behavioral Risk Factor Surveillance System

Introduction

Lesbian, gay, bisexual, and transgender (LGBT) populations in the United States historically have been infrastructurally disadvantaged and underrepresented in national health studies, leading to a limited understanding of health disparities experienced in these populations. Within the LGBT community, lesbian and bisexual women have unique healthcare needs and challenges [1]. Despite the growing evidence displaying a need for research on SGM women, a recent review found that between 1989 and 2011, there were only 113 National Institutes of Health (NIH) funded studies focused on LGBT health that were not exclusive to HIV or sexual health [2]. Additionally, only 13% of all LGBT NIH funded studies examined the health of SGM women [2]. Over the past few decades, LGBT populations have become more visible in popular culture and have gained access to rights they were once denied through social movements. Governmental institutions have begun to implement policies and infrastructures to protect rather than pathologize LGBT individuals [3]. Thus, there has been an increase in funding for research on lesbian and bisexual women, among other SGM populations, to effectively identify, address, and alleviate health disparities.

Following the emergence of women's health as a field of study in the latter half of the twentieth century, the Institute of Medicine (IOM) released a report on the state of a lesbian health in 1999 [4]. The intention of the report was to argue the importance of studying the health of lesbian women, while addressing misconceptions, recommending methodology for conducting research, and identifying health disparities. In their report, the IOM focused on women who

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primarily partner with women. This report was narrow in its scope due to the lack of research on racial and ethnic minority lesbian women and other sexual minority women. Despite this limitation, the report provided a foundation for studying the health of lesbian and bisexual women.

Since the 1999 report *Lesbian Health*, the National Institutes of Health (NIH) recommended the IOM publish an updated review on LGBT health. *The Health of Lesbian, Gay, Bisexual, and Transgender People* provides an updated view on health disparities faced by the community and intersectional methodologies [5]. This report identified various barriers to accessing healthcare, including social stigma and the environment. In 2001, Massachusetts began collecting sexual orientation information in its statewide Behavioral Risk Factor Surveillance Survey (BRFSS). Conron et al. aggregated this data from 2001 to 2008 to identify patterns in self-reported health-related behaviors in SGM populations [6]. This study found that lesbian and bisexual women reported higher rates of obesity and cardiovascular disease. SGM women reported increased likelihood of engaging in risky behaviors like smoking, binge-drinking, and illicit drug use. This study also reported that bisexual and lesbian women were more likely to have experienced suicidal ideation and mental distress [6]. Fredriksen-Goldsen and colleagues found similar results using BRFSS data from Washington state, which started collecting sexual orientation data in 2003 [7].

Studies increasingly find that lesbian and bisexual women are subject to higher rates of chronic diseases, mental illness, and disability [6–10]. Lesbian and bisexual women were less likely to access to healthcare services and less likely to utilize preventative care, partially due to stigma [1, 11, 12]. There is also evidence suggesting lesbian and bisexual women engage in more risky behaviors than heterosexual women, including smoking and excessive drinking [7, 13–16]. However, the majority of past studies to identify health disparities of SGM have used small sample sizes, non-randomized samples, samples from LGBT organization or clinics, or state specific data [6, 7, 9, 17–20]. They also tend to evaluate health disparities of SGM populations when compared to the heterosexual populations and omit analyses of health disparities between SGM populations.

Historically, there have been few population-based studies with adequate LGBT samples to allow for in-depth analyses of health disparities among this population [10, 15]. Fortunately, the Center for Disease Control and Prevention (CDC) began including questions about sexual orientation and gender identity in their National Health Interview Survey (NHIS) and the national Behavioral Risk Factor Surveillance Survey (BRFSS) in 2013 and 2014, respectively. The sexual orientation and gender identity (SOGI) module is an optional module provided by the CDC that individual states can utilize [21]. Studies using the NHIS data to identify population-based health disparities among SGM found that lesbian and bisexual women were more likely to engage in unhealthy behaviors and that lesbian women were more likely to be obese, have functional limitations, and less likely to utilize healthcare [13, 16]. A study of the 2014–2015 national BRFSS found that lesbian and bisexual women were more likely to report mental distress and disorders, including depression, in comparison to heterosexual women. It also confirmed that SGM populations faced health disparities including increased odds of chronic health problems and reduced physical health [15].

The inclusion of the SOGI module in the BRFSS allows researchers to target health disparities in the population of SGM women and implement evidence-based interventions to alleviate health disparities. This aligns with the objectives of *Healthy People 2020*, which aims to eliminate health inequities, including those faced by lesbian and bisexual women [22]. The purpose of this study is in accordance with the goals of *Healthy People 2020 and* utilized the national BRFSS data from 2016 to identify differences in general health, depression, health care access, preventative care, and health risk behaviors between women who self-identified as straight, lesbian, or bisexual.

Methods

Study Design

This was a cross-sectional study of the national 2016 BRFSS data, the largest health survey of adults 18 and older in the U.S. This study was deemed exempt by the University of Nevada, Las Vegas Institutional Review Board (IRB).

Behavioral Risk Factor Surveillance System and Participants

The BRFSS is an annual survey that was first administered in 1984. The survey is a collaboration between the Centers for Disease Control and Prevention (CDC) and each state/US territory (50 states plus Guam, Puerto Rico, and the Virgin Islands) and employs a random-digit dial telephone survey that targets non-institutionalized adults 18 years of age and older [23]. Since 2011, the BRFSS has included both cellular and landline telephones to produce generalizability, coverage, and validity of the data. Disproportionate stratified sampling is employed to provide an adequate sample size for smaller demographic areas [23]. Data are weighted for population attributes and non-response [23].

The core component of the BRFSS questionnaire includes questions that are asked of all respondents about their demographics, preventative health practices, chronic diseases, and health risk behaviors. Additionally, states can select to

include optional modules provided by the CDC in the survey. In 2014, the SOGI module was added to the optional modules, and the question was, "Do you consider yourself to be (1) straight, (2) lesbian or gay, (3) bisexual, or (4) other". Participants were told that they were being asked this question to "better understand the health and healthcare needs of people with different sexual orientation" [24]. In 2016, 26 states (California, Connecticut, Delaware, Georgia, Guam, Hawaii, Idaho, Illinois, Indiana, Iowa, Kentucky, Louisiana, Massachusetts, Minnesota, Mississippi, Missouri, Nevada, New York, Ohio, Pennsylvania, Rhode Island, Texas, Vermont, Virginia, Washington, and Wisconsin) included this module, and 199,837 participants reported their sexual orientation [21].

The number of people identifying as straight was far greater than the other categories [192,445 straight (97%), 3057 lesbian or gay (1.5%), 3433 bisexual (1.7%)] in 2016. Significance testing results may be misleading in large samples such as this, where small effects can product statistically significant results that might not be practically or meaningfully significant [25, 26]. To account for this possibility, we randomly selected a smaller sample (10,000) of those participants who identified as straight. The purpose of this was to overcome identifying statistically significant differences between groups that were simply due to a large sample size. To ensure that our random sample was a true representation of the larger sample, we conducted a sensitivity analysis by randomly selecting four additional samples with 10,000 participants who identified as straight and compared the results to the first sample. We found no significant differences among the random samples analyzed, and hence we used the first randomly selected sample for the analyses presented here. We further limited the sample for this analysis to only include those who identified as (1) a straight, (2) lesbian (those who jointly met the criteria of reporting lesbian or gay and identified as female in the survey), or (3) bisexual women.

Participants provided demographic data including age, employment, education, race/ethnicity, and income. To gauge healthcare access, we used questions that asked about access to health insurance, a personal doctor, delaying care due to cost, and a medical check-up. General health questions that we used were general health, depression, and obesity/overweight. To evaluate health risk behavior, we included the questions for smoking, alcohol consumption, and physical inactivity. Lastly, to examine preventative care, we used the questions for mammogram, pap test, and HIV test.

Data Analysis

IBM SPSS (v. 24) with complex samples was used for statistical analyses so that weighting could be applied to the BRFSS survey data. Weighted descriptive statistics were calculated to describe the demographic characteristics for the three sexual orientation categories by race/ethnicity, age, education, and income. Rao-Scott chi square analyses were used to identify significant differences among groups. Answers to questions for general health, health care access, health risk behaviors, and preventative care were dichotomized as 'yes' or 'no' with 'I don't know' or 'refused to answer' coded as missing. Data were analyzed using logistic regression to calculate odds ratios and multiple logistic regression to calculate adjusted odds ratios. Demographic characteristics that were significantly different between groups were entered into the multiple logistic regression model to adjust estimates. For the first set of analyses, participants who identified as straight were used as the reference to compare outcomes in that group to lesbian and bisexual women. A second set of analyses were used to compare those who identified as a lesbian to bisexual woman, and we used lesbian women as the reference. All analyses were conducted at $\alpha = 0.05$.

Results

A total of 9016 women who provided responses to the questions posed in this analysis comprised the total number of unweighted records utilized in the study. Of the sample, 1239 identified as lesbians, 2180 as bisexual women, and 5597 as straight women. There were significant differences between groups with regards to race/ethnicity ($p = 0.01$), age ($p < 0.01$), income ($p < 0.01$), and employment ($p < 0.01$) (Table 1). Women who identified as lesbian were more likely to be from a minority group (Black, Asian, Hispanic) when compared to bisexual or straight women. Bisexual women were more likely to be in the younger age groups (18–24 and 25–34) and were less likely to report an income of greater than $50,000. Straight women were more likely to be out of the labor force (retired, student, not looking for employment). Because there was not multicollinearity between these variables, they were all used to adjust the odds in the multiple logistic regression model.

Table 2 provides the odds and adjusted odds ratios comparing women who identified as lesbian or bisexual to women who identified as straight. For the adjusted odds ratios, women who identified as lesbian or bisexual were more 2 and 3 times more likely to report depression, respectively; bisexual women were 33% less likely to report good to excellent health; and lesbians were 1.4 times more likely to be overweight or obese and 1.4 times more likely to report being physically active. Women who identified as bisexual were 1.6 more likely to delay health care due to cost, even with controlling for income and employment. Women who identified as lesbian or bisexual were more likely to engage

Table 1 Demographic characteristics of the sample

Variable	Lesbians N = 1239 Weighted N = 910,191.6 % = 15.2	Bisexual women N = 2180 Weighted N = 1,826,025.1 % = 30.4	Straight women N = 5597 Weighted N = 3,263,372.9 % = 54.4	Chi square p-value
Race/ethnicity				**p = 0.01**
White	56.6%	63.5%	65.6%	
Black	14.3%	10.0%	10.9%	
AI/AN	0.5%	1.1%	0.7%	
Asian	7.1%	4.0%	5.5%	
NH/PI	0.2%	0.5%	0.1%	
Other	0.3%	0.2%	0.3%	
Multiple race	3.1%	3.8%	1.0%	
Hispanic	16.8%	15.8%	14.0%	
Missing	1.0%	1.1%	1.9%	
Age				**p < 0.01**
18–24	19.4%	36.4%	10.2%	
25–34	20.3%	29.6%	15.1%	
35–44	15.3%	15.0%	17.0%	
45–54	20.2%	8.8%	16.5%	
55–64	12.5%	5.0%	18.4%	
65 +	12.2%	5.2%	22.8%	
Education				p = 0.16
Did not graduate high school	12.1%	14.1%	12.8%	
Graduated high school	21.7%	26.6%	25.1%	
Attended college	35.7%	37.2%	34.2%	
Graduated college	30.4%	21.7%	27.7%	
Missing	0.1%	0.4%	0.2%	
Income ($)				**p < 0.01**
<15,000	12.8%	13.1%	9.0%	
15–24,999	13.8%	20.3%	15.9%	
25–34,999	7.4%	9.2%	8.4%	
35–44,999	10.2%	12.1%	10.6%	
>50,000	43.4%	26.7%	40.5%	
Missing	12.4%	18.5%	15.6%	
Employment				**p < 0.01**
Employed	63.4%	61.5%	54.5%	
Unemployed	9.1%	11.8%	4.8%	
OLF	27.5%	26.7%	40.8%	

OLF out of labor force (student, retired, not looking for work)

in all health risk behaviors: current smoker, current e-cigarette user, binge drinker, or heavy drinker. Women who identified as bisexual and were 40 years or older were less likely to have had a mammogram in the past 2 years, and both lesbian and bisexual women between the ages of 18 and 64 years were less likely to have had a pap test in the past 3 years. Lastly, bisexual women were more likely to have had an HIV test.

Table 3 provides the odds and adjusted odds ratios comparing women who identified bisexual to women who identified as lesbian. For the adjusted odds ratios, women who identify as bisexual were 1.6 times more likely to report depression and 1.8 times more likely to have had an HIV test. Women who identified as bisexual and were 40 years or older less likely to have had a mammogram in the past 2 years.

Discussion

This study confirms some of the findings from previous smaller or state specific SGM studies and the limited studies utilizing population-based data [6, 7, 9, 10, 15, 16,

Table 2 Odds and adjusted odds ratios for general health, access to care, health risk behavior, and preventive care with straight women as the reference group

Variable	Odds ratio	95% Confidence interval	Adjusted odds ratio	95% Confidence interval
General health good–excellent				
Lesbian	1.184	0.778–1.803	1.257	0.730–2.164
Bisexual women	0.907	0.721–1.140	**0.670**	**0.496–0.906**
Depression				
Lesbian	**2.165**	**1.577–2.973**	**2.214**	**1.495–3.278**
Bisexual women	**3.602**	**2.944–4.406**	**3.647**	**2.813–4.730**
Overweight/obese				
Lesbian	1.294	0.976–1.715	**1.387**	**1.025–1.877**
Bisexual Women	0.933	0.765–1.137	1.207	0.955–1.526
Health insurance				
Lesbian	0.996	0.645–1.537	1.157	0.691–1.937
Bisexual women	**0.542**	**0.387–0.760**	0.740	0.506–1.082
Personal doctor				
Lesbian	0.739	0.480–1.137	0.908	0.611–1.350
Bisexual women	**0.445**	**0.349–0.569**	0.773	0.578–1.033
Delay care due to medical cost				
Lesbian	**1.602**	**1.021–2.514**	1.301	0.807–2.096
Bisexual women	**2.165**	**1.683–2.785**	**1.593**	**1.181–2.149**
Medical check-up in last 2 years				
Lesbian	0.961	0.546–1.693	1.110	0.633–1.946
Bisexual women	**0.745**	**0.568–0.977**	1.077	0.762–1.523
Exercise				
Lesbian	**1.432**	**1.066–1.923**	**1.421**	**1.004–2.010**
Bisexual women	**1.270**	**1.026–1.570**	1.003	0.776–1.297
Current smoker				
Lesbian	**2.009**	**1.445–2.794**	**1.814**	**1.249–2.636**
Bisexual women	**2.403**	**1.949–2.963**	**2.106**	**1.652–2.685**
e-Cigarette user				
Lesbian	**2.666**	**1.636–4.344**	**2.390**	**1.402–4.075**
Bisexual women	**3.346**	**2.345–4.774**	**2.342**	**1.550–3.538**
Binge drinker				
Lesbian	**1.900**	**1.338–2.696**	1.390	0.962–2.007
Bisexual women	**2.779**	**2.140–3.609**	**1.593**	**1.162–2.184**
Heavy drinker				
Lesbian	**2.635**	**1.743–3.983**	**2.338**	**1.581–3.457**
Bisexual women	**2.888**	**2.095–3.982**	**2.487**	**1.762–3.510**
Mammogram—age 40 +				
Lesbian	1.038	0.728–1.479	1.142	0.804–1.623
Bisexual women	**0.534**	**0.393–0.726**	**0.611**	**0.440–0.848**
Mammogram—age 50 +				
Lesbian	1.167	0.766–1.777	1.109	0.715–1.722
Bisexual women	0.698	0.463–1.053	0.751	0.479–1.176
Pap test, past 3 years				
Lesbian	**0.442**	**0.289–0.677**	**0.418**	**0.279–0.625**
Bisexual women	**0.518**	**0.385–0.697**	**0.585**	**0.421–0.813**
HIV test				
Lesbian	**1.506**	**1.129–2.008**	1.153	0.833–1.596
Bisexual women	**2.813**	**2.320–3.411**	**2.107**	**1.687–2.632**

Bolding = $p \leq 0.05$

Table 3 Odds and adjusted odds ratios for health, access to care, preventive care, and health risk behavior with Lesbian women as the reference group

Variable	Odds ratio	95% Confidence interval	Adjusted odds ratio	95% Confidence interval
General health good–excellent				
Bisexual women	0.766	0.496–1.182	**0.602**	**0.378–0.959**
Depression				
Bisexual women	**1.664**	**1.202–2.303**	**1.648**	**1.149–2.362**
Overweight/obese				
Bisexual women	**0.721**	**0.534–0.973**	0.870	0.626–1.210
Health insurance				
Bisexual women	**0.545**	**0.353–0.841**	0.639	0.380–1.075
Personal doctor				
Bisexual women	**0.603**	**0.390–0.933**	0.851	0.554–1.307
Delay care due to medical cost				
Bisexual women	1.351	0.863–2.117	1.225	0.745–2.013
Medical check-up in last 2 years				
Bisexual women	0.775	0.435–1.382	0.971	0.530–1.778
Exercise				
Bisexual women	0.887	0.645–1.219	0.706	0.486–1.025
Current smoker				
Bisexual women	1.196	0.847–1.689	1.161	0.782–1.723
e-Cigarette user				
Bisexual women	1.255	0.784–2.009	0.980	0.577–1.664
Binge drinker				
Bisexual women	**1.463**	**1.033–2.071**	1.146	0.794–1.655
Heavy drinker				
Bisexual women	1.096	0.708–1.697	1.063	0.683–1.656
Mammogram—age 40				
Bisexual women	**0.515**	**0.336–0.789**	**0.535**	**0.350–0.819**
Mammogram—age 50				
Bisexual women	0.599	0.352–1.018	0.677	0.385–1.191
Pap test				
Bisexual women	1.172	0.756–1.817	1.402	0.892–2.203
HIV test				
Bisexual women	**1.868**	**1.373–2.543**	**1.827**	**1.277–2.614**

Bolding = $p \leq 0.05$

18–20, 26]. A strength of this study was that we randomly selected a smaller sample of participants who identified as straight to reduce the risk of stating significant differences with small effect sizes that result from having a large sample size as opposed to having meaningful differences. We found that lesbian women were more likely to identify as Black or Hispanic. Bisexual women were more likely to be in the younger age bracket, which may explain why they were less likely to be college graduates or to be in the higher income bracket. SGM women are interspersed within racial and ethnic communities, geographical locations, and socioeconomic backgrounds. The health of lesbian and bisexual women is different than their heterosexual counterparts within the aforementioned population segments [27]. They may experience multiple forms of disenfranchisement based on the intersections of their identities and socioeconomic backgrounds which may lead to increased rates of health disparities among SGM women who are also from racial or ethnic minority groups or lower socioeconomic status.

Similar to previous studies, we found that lesbian and bisexual women were more likely to engage in health risk behaviors including cigarette or e-Cigarette use and heavy or binge drinking when compared to straight women [6, 7, 15, 16]. However, there were not significant differences in these behaviors between lesbian and bisexual women. Lesbian and bisexual women were also more likely to report depression when compared to straight women [6, 7, 15]. Importantly, bisexual women were at a higher risk of depression when compared to lesbian women and were less likely to report 'good to excellent' health than lesbian or straight women.

Researchers attribute these various health disparities to "gay-related stress" caused by discrimination and homophobia, among others [8, 28]. Fredrisksen-Goldsen et al. present a reconceptualization of the Health Equity Promotion Model as a framework to understand how the environmental and structural context in which SGM people live influences behavior and physical and mental health [3]. Factors at the structural level include social exclusion, social stigma, and institutional heterosexism while factors at the individual level include micro-aggression, discrimination, victimization, and abuse. Over the life course, these can contribute to health risk behaviors such as excessive alcohol consumption and tobacco use which in-turn increase the risk for poorer physical and mental health. Despite the growing evidence indicating a need for community-specific intervention to decrease health risk behaviors, lesbian and bisexual women are not often targeted in public health project planning.

Lesbian and bisexual women were less likely to have had a pap test when compared to straight women and bisexual women 40 years and older were less likely to have had a mammogram when compared to straight and lesbian women. This is concerning because SGM women are not at a reduced risk for cervical cancer or breast cancers [1, 4]. Bisexual women were also more likely to delay healthcare due to cost and this finding remained after controlling for income, age, and employment and despite there being no significant difference in access to health insurance between groups. Several factors may contribute to the lower preventive care and healthcare utilization among SGM women. Because some SGM women are less in need of obstetric or prenatal care, they are less likely to receive gynecological care and screening than their straight counterparts [29]. The heterosexist structure in healthcare which assumes all women are straight, also presents a barrier to care in that SGM patients have to "come out" to each of their providers [1]. This results in SGM patients feeling vulnerable, discriminated against, and stigmatized. These issues may be more significant for bisexual women who have been found to be less likely to disclose their sexual orientation to healthcare providers when compared to women who identify as lesbian [30]. Additionally, healthcare providers may not have knowledge about issues specific to SGM patients, and they may lack sensitivity towards the SGM community [1].

Lastly, bisexual women were more likely to have received an HIV test when compared to both straight and lesbian women. This may be due to the heighten focus on HIV testing among the LGBT population, particularly among those who identify as gay or bisexual due to the increased risk for infection. Eighty-two percent of NIH funded LGBT research studies have focused on HIV or other sexual health issues, and 90% of NIH funded LGBT intervention studies have been specific to HIV or other sexual health issues [2]. Although most of these studies have focused on gay and bisexual males, interventions to increase HIV testing often occur in LGBT settings including LGBT centers and bars with healthcare providers who are more sensitive to the needs of the LGBT community. Additionally, bisexual women might be more likely to test for HIV due to their perceived or actual risk of contracting HIV [31].

Limitations

There were limitations with this study. Causation cannot be determined because the BRFSS is cross-sectional [32]. The BRFSS study population includes non- institutionalized adults who have access to a landline or cellular phone. This excludes data from people who are homeless or without access to a phone, are in nursing homes or other medical facilities, or are incarcerated. There is also the possibility of bias resulting from self-reported information. The participants may have under or over reported information if they answered with what they perceived to be socially desirable responses [33]. This may have influenced their answers to the sexual orientation question. Additionally, there may be self-selection bias in that people who chose to participate were more interested in the study than those who chose not to participate. Lastly, 26 states/territories included the sexual orientation question in 2016, and results may not be generalizable to the other states/territories.

Conclusions

There is a paucity of population-based research to identify health disparities experienced by SGM women. Of the few population-based studies, most (including ours) identify about 3% of the sample as SGM. That said, our study supports most of the previous research. SGM women are more likely to engage in the health risk behaviors of smoking and heavy/binge drinking, are more likely to report depression, and are less likely to receive some preventative healthcare services. Additionally, bisexual women are more likely to report depression and less likely to report good to excellent health than straight or lesbian women. Health promotion interventions to reduce health risk behavior and improve access to care for SGM women must acknowledge and address the environmental and structural context in which SGM women live in addition to individual behavior change.

Compliance with Ethical Standards

Conflict of interest Authors do not have conflicts of interests to report.

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