

## Research Article

# Differences in Mental, Cognitive, and Functional Health by Sexual Orientation Among Older Women: Analysis of the 2015 Behavioral Risk Factor Surveillance System

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## Abstract

**Background and Objectives:** This study addresses a gap in the knowledge base regarding whether there are differences in mental, cognitive, and functional health between sexual minority women aged 65 and older and their heterosexual counterparts, as well as whether disparities are moderated by age, socioeconomic status, and race/ethnicity.

**Research Design and Methods:** This study analyzes 2015 Behavioral Risk Factor Surveillance System data from 21 states. Multivariate logistic regression is used to test the hypotheses.

**Results:** Compared to heterosexual women, lesbian/gay women aged 65 and older report worse functional health and bisexual women report worse cognitive health and more difficulties with instrumental activities of daily living. Disparities are particularly present for women in their late 60s and those in their 70s. While the likelihood of a depression diagnosis tends to be lower for heterosexual women with higher income, the inverse is true of sexual minority women. Additionally, sexual minority women with less education have lower odds of frequent mental distress and activity limitations than those with some college education. Sexual minority women of color have significantly lower odds of frequent mental distress, activity limitations, and use of special equipment compared to white sexual minority women.

**Discussion and Implications:** Findings indicate a need for gerontological services that provide support to older sexual minority women, particularly in relation to cognitive and functional health. Future research is needed to understand risk and protective factors contributing to these disparities, including forms of resilience that occur among older sexual minority women of color.

**Keywords:** Women, Sexual minority, Mental health, Functional health, Cognitive health

In recent years, lesbian, gay, and bisexual (LGB, or *sexual minority*) older women are being studied with greater frequency and depth, including as part of an NIH-funded study of LGB and transgender aging (Fredriksen-Goldsen et al., 2011). However, many topics have yet to be examined in relation to aging and health disparities among LGB women aged 65 and older. The 2011 IOM report noted a dearth of research about the mental and physical health status of LGB adults as they age and how health status

varies by other sociodemographic characteristics, such as race, ethnicity, or socioeconomic status. Few studies have used population-based samples or directly compared older LGB women to their same-age heterosexual peers on health outcomes. Further, there appears to be little research about older LGB women's functional health, including ability to engage in activities of daily living (ADLs) and instrumental activities of daily living (IADLs) (Gonzales & Henning-Smith, 2015; IOM, 2011). This is a critical gap, as

disparities in functional health would likely require greater use of informal caregivers or formal long-term services and supports, such as home-based services and institutional care. The present study aims to address these gaps through analysis of data from the 2015 Behavioral Risk Factor Surveillance System (BRFSS). Before detailing the current study's design, this article will first review the literature in this area and the conceptual framework driving this study.

### Older Sexual Minority Women: Mental, Cognitive, and Functional Health

A person's mental health, likelihood of disability, and functional ability in later life can be related to lifetime exposure to discrimination, lack of social support, and poverty, as well as having lower educational attainment (Fredriksen-Goldsen, Kim, Bryan, Shiu, & Emler, 2017; Kim, Jen, & Fredriksen-Goldsen, 2017; Thorpe et al., 2008). Consequently, groups that experience disadvantage in these areas may demonstrate poorer health at earlier ages, accelerated aging, and earlier mortality compared to their more advantaged peers (Adler et al., 2013; Crimmins, Kim, & Seeman, 2009; Geronimus et al., 2010; Thorpe et al., 2008). Such knowledge suggests that similar patterns may occur for LGB older women compared to heterosexual women, though perhaps moderated by other characteristics such as income, educational attainment, race/ethnicity, and social support.

Compared to heterosexual women, sexual minority women face greater risks for mental health problems such as depression, frequent mental distress, and greater tension or worry due to the marginalization, discrimination, and stigma they face in the broader social environment (Conron, Mimiaga, & Landers, 2010; Gonzales & Henning-Smith, 2017). However, there are few studies that focus particularly on the mental health of sexual minority women aged 65 and older. Studies that use population-based data tend to combine middle age and older women, only gather information about co-habiting with a same-sex partner rather than LGB identity, or are limited to one region of the United States. Gonzales and Henning-Smith (2015) found that women aged 50 older who were cohabiting with a same-sex partner showed greater psychological distress than women who were married to a male partner. A study by Fredriksen-Goldsen and colleagues (2013) in Washington state found that lesbian and bisexual women aged 50 and older reported poorer mental health than heterosexual women. Similar findings have been documented among women aged 50–70 in California (Wallace, Cochran, Durazo, & Ford, 2011).

Little research has looked at differences in women's cognitive or functional health by sexual orientation. Sexual minority women have increased risks for dealing with some modifiable risk factors for cognitive impairment, including smoking, social isolation, mental distress, obesity, and cardiovascular disease (Fredriksen-Goldsen et al.,

2013; Fredriksen-Goldsen, Jen, Bryan, & Goldsen, 2016; Gonzales & Henning-Smith, 2015). Lesbian and bisexual women may face higher risks for conditions that may contribute to or co-exist with mobility difficulties over the life course, such as arthritis and asthma (Conron et al., 2010; Gonzales & Henning-Smith, 2017). Gonzales and Henning-Smith (2017) found that lesbians and bisexual women aged 18 and older show greater activity limitations and obesity than heterosexual women. In a different study, Gonzales and Henning-Smith (2015) found that women aged 50 and older in same-sex cohabitating relationships reported greater need for help with ADLs and IADLs than women who were married to male partners. In Washington state, lesbian and bisexual women aged 50 and older reported more activity limitations and use of special equipment than heterosexual women (Fredriksen-Goldsen et al., 2013). In a survey in California, lesbian and bisexual women aged 50–70 were more likely to report having a physical disability than heterosexual women of similar age (Wallace et al., 2011). These patterns suggest that lesbian and bisexual women may face greater challenges in functional ability compared to heterosexual women, as well as greater risk factors related to cognitive impairment. However, few studies have used population-based data from across the United States to examine health disparities for women past typical retirement age.

Additionally, little is known about whether such disparities may be moderated by characteristics such as race/ethnicity or socioeconomic status (Gonzales & Henning-Smith, 2015), and most research examining physical or mental health among LGB older adults by these characteristics does not include a comparison group of heterosexual adults to see if patterns are divergent by sexual orientation. Research with LGB and transgender midlife and older adults has tended to show physical health disparities by race/ethnicity and income, suggesting that people of color (particularly Native Americans, African Americans, and Hispanics) and those of lower income are more likely to face health conditions such as diabetes, obesity, HIV/AIDS, and/or cardiovascular disease (Fredriksen-Goldsen et al., 2011; Kim, Jen, & Fredriksen-Goldsen, 2017). One of the initial reports on the *Caring and Aging with Pride* study indicated worse mental health indicators among Native American and Hispanic LGBT midlife and older adults compared to whites (Fredriksen-Goldsen et al., 2011). Later data collection from the same project provides some evidence that psychological quality of life might not differ between Hispanic, African American, and white LGBT midlife and older adults before controlling for health promotion and risk behaviors; after controlling for such factors, Hispanic and African American LGBT older adults had better psychological quality of life than white LGBT adults (Kim et al., 2017). Another analysis by Kim and Fredriksen-Goldsen (2017) identified worse mental health quality of life between Hispanic midlife and older LGB adults compared to non-Hispanic whites, although this

sample was more than 60% male. There is a need for research that examines the moderating role of race/ethnicity and socioeconomic status for health disparities, particularly for LGB women aged 65 and older compared to heterosexual women.

## Conceptual Framework

The life-course perspective posits that a person's experience of aging is not simply affected by the individual's chronological age (Dannefer & Settersten, 2010, p. 3). Instead, "life experiences, which are inevitably organized by social relationships and societal contexts in which individuals are located, powerfully shape how people grow old" (Dannefer & Settersten, 2010, p. 4). While this theory is broad in scope (Elder & Shanahan, 2006), the emphases on cumulative advantage and disadvantage during one's lifespan and the interaction between a person and their social context are insightful in studying LGB aging. For example, this perspective suggests that LGB older adults' current health is influenced by lifetime experiences of discrimination, internalized homophobia, and social stigma that are connected to sexual orientation, as well as strategies for resilience and social support that LGB people have developed to cope and thrive (Fredriksen-Goldsen et al., 2017; Kim, Jen, & Fredriksen-Goldsen, 2017). Health disparities, as well as differences in the aging process, are tied to these larger social experiences. Since LGB adults, on average, are exposed to a greater number of potential stressors throughout the life-course than heterosexual adults, LGB adults might be theorized to not only demonstrate disparities in health but also show some indicators of earlier aging-related health struggles compared to heterosexuals. Further, there may be differences in health *within* the population of sexual minority women such that certain groups (e.g., sexual minority women of color) may demonstrate different health patterns in later life due to lifetime exposure to risks such as discrimination.

## Research Gaps and Current Study

Very few studies have used population-based data to study the mental, cognitive, or functional health of older sexual minority women compared to heterosexual women. Comparing sexual minority women to their heterosexual peers helps document whether there are unique patterns of health and aging for sexual minority women that may require tailored gerontological services and interventions that differ from those needed for heterosexual women. Studies that do exist in this area tend to either use convenience samples, lack a comparison group, or capture same-sex cohabitation only, which ignores LGB women not in a relationship. Few studies focus on women who are past the traditional age of retirement when aging-related health issues tend to appear for larger portions of the general population, and little research has been able to draw

generalizable conclusions about disparities and the differential impact on subgroups of sexual minority older adults. The present study intends to address such gaps.

The hypotheses of this study are as follows:

1. Sexual minority women aged 65 and older will report worse mental health, cognitive health, and functional health compared to heterosexual women of similar age.
2. Sexual minority women aged 65 and older will report poorer cognitive and functional health particularly among the younger cohorts of older adults (i.e., those in their 60s and 70s) compared to heterosexual women, reflecting a pattern of accelerated aging.
3. Differences by sexual orientation will be moderated by socioeconomic status for mental, cognitive, and functional health, and by race/ethnicity for cognitive and functional health so that those of lower socioeconomic status and those who are women of color will report poorer health. The hypothesized lack of significant moderation by race/ethnicity for mental health is based upon conflicting evidence from past research with LGB older adults, as well as the fact that the present study requires collapsing race/ethnicity into two categories (white/person of color) such that differences for certain ethnic subgroups (e.g., Hispanic women) cannot be parsed out.

## Research Design and Methods

This study uses data from the 2015 BRFSS, a cross-sectional, state-based telephone survey coordinated each year by the Centers for Disease Control and Prevention (CDC) and carried out by state health departments. This survey captures information about preventative health behaviors and health risks among the general population of community-dwelling adults. The BRFSS uses complex sampling (disproportionate stratified sampling for landline calls, and random sampling of cell phones). When accounting for the survey's sampling and weighting, the BRFSS data are meant to be representative of the U.S. adult population.

In 2015, 21 states used the Sexual Orientation and Gender Identity (SOGI) optional BRFSS module (see [Supplementary Figure 1](#) in the Appendix), and these states are captured in the present study. The sexual orientation question on the survey was: *Do you consider yourself to be: straight, lesbian or gay, or bisexual?* Interviewers could also mark "other" if the respondent described another type of identity or select "refused" or "don't know/not sure" (While those who responded "don't know" [ $n = 604$ ] could include people who are questioning their identities, among older women, this group might also include those who (a) did not understand the question due to lack of exposure to LGB language, (b) are offended by the question, or (c) did not understand the question due to cognitive limitations. Chi-square tests [not shown here] indicating that "don't know" respondents were significantly more likely than other older women to have cognitive limitations, use special equipment

for health needs, and have physical limitations, but no different from other older women in emotional health. For these reasons, the “don’t know” orientation group was not included.). For this analysis, the focus is on comparing heterosexual women aged 65 and older ( $n = 34,361$ ) to those who identified as either lesbian or gay ( $n = 158$ ) or bisexual ( $n = 188$ ). The “other” group was dropped from analysis because of the uncertainty regarding whether these were sexual minority women or whether they would have been more properly categorized as refusing to answer this question.

## Measures

Besides sexual orientation, the present analysis filtered respondents by age and sex so that only females aged 65 or older were included. This age group was selected both to more closely analyze the health needs of the oldest sexual minority women and to keep some covariates such as income more controlled since women aged 65 and older are likely to have access to a stable income source, such as Social Security.

## Dependent Variables

Three major areas of health were examined in this study: mental health, cognitive health, and functional health. The first measure of mental health, frequent mental distress, was based on the question: *Now thinking about mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?* Responses were dichotomized into 13 or fewer days per month (coded as 0) and 14 or more days per month (coded as 1). The 14-day cutoff has been previously used to compare population subgroups on mental health-related quality of life (Moriarty, Zack, & Kobau, 2003). The second mental health measure was an indicator of depression: *Has a doctor, nurse, or other health professional ever told you that you have a depressive disorder, including depression, major depression, dysthymia, or minor depression?* Those who answered yes were coded as 1, while those who answered no were coded as 0.

One measure reflected cognitive health: *Because of a physical, mental, or emotional condition, do you have serious difficulty concentrating, remembering, or making decisions?* “Yes” responses were coded as 1 and “no” responses as 0.

Finally, five measures were examined in relation to functional health. For each measure, “yes” was coded as 1 and “no” as 0. The first question was: *Are you limited in any way in any activities because of physical, mental, or emotional problems?* The second measure was: *Do you now have any health problem that requires you to use special equipment, such as a cane, a wheelchair, a special bed, or a special telephone?* The third measure was: *Do you have serious difficulty walking or climbing stairs?* The fourth measure captured ability to engage in ADLs: *Do you have difficulty dressing or bathing?* The fifth measure captured

ability to engage in IADLs: *Because of a physical, mental, or emotional condition, do you have difficulty doing errands alone such as visiting a doctor’s office or shopping?*

## Control Variables

According to the life-course perspective, other sociodemographic characteristics beyond sexual orientation can affect one’s experiences of aging and health, and such characteristics are included here as controls. Using the BRFSS’s question about current age, dummy control variables were created for the following age groups: 70–74, 75–79, and 80 and up, with 65- to 69-year-olds as the reference group. Second, annual household income was categorized into four \$25,000 intervals, ranging from “Less than \$25,000” to “\$75,000 or more.” Since the impact of household income can vary widely depending upon household size, the total number of household members (adults + children) was included as a control variable. Education level was captured by the question, *What is the highest grade or year of school you completed?* This was coded so that 0 = *at least some college* and 1 = *a high school diploma/GED or less*. Another measure of socioeconomic status was home ownership: *Do you own or rent your home?* Those who owned their home were coded as 0, and those who rented or had another arrangement were coded as 1. Finally, a dichotomous measure of race/ethnicity was included, where 0 = *white, non-Hispanic*, and 1 = *person of color*. Additional race/ethnicity categories could not be included in multivariate models due to the small cell sizes that would result for older sexual minority women of color.

## Interaction Terms

To examine possible moderations by income, educational attainment, and race/ethnicity, three interaction terms were calculated for inclusion in multivariate logistic regression models. For each of these three interaction terms, the variable was computed by multiplying the variable of interest (income, educational attainment, or race/ethnicity, coded as noted above) by an LGB/heterosexual dummy variable (heterosexual = 0; LGB = 1). Separate interaction terms for age were not constructed, as age could be explored by running separate logistic regression models for women in their late 60s, 70s, and 80s+ and comparing results.

## Data Analysis

The BRFSS data were downloaded from the CDC website and analyzed using SPSS version 24 with the complex samples add-on to account for complex sampling and weighted data. Chi-square tests were used for sociodemographic comparisons by sexual orientation, and logistic regression for all multivariate models.

Data were examined to determine whether they met the assumptions of logistic regression, such as linearity in the logit and absence of multicollinearity (Tabachnick & Fidell, 2007). Correlations between predictor variables



were small to moderate in size (all  $<.40$ ), and there were no indications of multicollinearity in model output. Most assumptions of logistic regression were met; for some of the models predicting depression, activity limitations, and using special equipment, the household size variable was not linear to the logit of these outcomes. For these models, the household size variable was transformed to its inverse to address this issue. The models predicting ADLs had particularly small cell sizes when looking at ADL difficulties by LGB identity; for this reason, this outcome is only used for the logistic regression model looking at overall differences by sexual orientation (Hypothesis 1) and not for the models looking at interaction terms.

The only predictor variables with more than 2% missing data were the sexual orientation variable (11.2% missing) and the income variable (23.4% missing). Both of these variables showed patterns of missingness not at random (MNAR) in relation to some of the dependent variables. Multiple imputation assumes missingness at random or completely at random (Medeiros, 2016); therefore, this procedure was not used to predict missing values, and missing cases were dropped listwise from analyses. The patterns of missingness for the income and sexual orientation variables may bias results in a manner that is not fully understood.

For the logistic regression models, all variables were entered simultaneously. While sequential logistic regression was explored (with sexual orientation and/or interaction terms entered last depending on the models), complex samples analyses in SPSS require all variables to be entered in one step. Sequential logistic regression models run before using complex samples syntax tended to be more liberal in estimating the impact of LGB identity, suggesting that the models presented here may err on the side of underestimating sexual orientation disparities.

## Results

### Sample Demographics

The sample includes women aged 65 and older who lived in 1 of the 21 states incorporating the SOGI module in the 2015 BRFSS ( $N = 36,303$ ). For analyses related to the hypotheses, those who answered "Don't know/Not sure" ( $n = 604$ ), "Other" ( $n = 146$ ), or who refused to answer the sexual orientation question ( $n = 846$ ) were dropped from the analyses, leaving a final sample of  $N = 34,707$ .

For states that included the SOGI module in the BRFSS, after accounting for weighting within the survey design, 93.5% of older women are estimated to be heterosexual (unweighted  $n = 34,361$ ), 0.5% are lesbian or gay ( $n = 158$ ), and 0.5% are bisexual ( $n = 188$ ), with those remaining categorized as "Other," "Don't know," or refusing to answer. Focusing on the lesbian, bisexual, and heterosexual respondents, weighted estimates suggest that 31.8% of older women are between ages 65 and 69, 23.8% are between 70 and 74, 20.3% are between 75 and 79, and 24% are 80 years old

or greater. The majority (83.3%) are white non-Hispanic (unweighted  $n = 29,941$ ), while 9.7% are black non-Hispanic ( $n = 2,226$ ), 3.9% are Hispanic ( $n = 863$ ), 2.3% are another race, non-Hispanic ( $n = 812$ ), and 0.8% are multiracial, non-Hispanic ( $n = 477$ ). Just under 14% of older women have not graduated high school (unweighted  $n = 2,723$ ), 35.6% have a high school diploma or GED ( $n = 11,647$ ), 30.9% have attended college or technical school ( $n = 9,630$ ), and 20.1% have graduated from college or technical school ( $n = 10,632$ ). About 35.2% of older women in these 21 states are estimated to have an annual household income of  $<\$25,000$  (unweighted  $n = 9,196$ ), 33.4% have an income of  $\$25,000$ – $\$49,999$  ( $n = 8,842$ ), 14.5% have an income of  $\$50,000$ – $\$74,999$  ( $n = 3,910$ ), and 16.9% have an income of  $\$75,000$  or more ( $n = 4,653$ ). Table 1 provides a comparison of weighted sociodemographic characteristics by sexual orientation. Age, educational attainment, and health insurance status differ significantly in distribution among older women by sexual orientation.

Among this sample, 8% of older women reported experiencing 14 or more days in the past month of poor mental health, 18.4% had ever been told by a health provider that they have depression, 30.9% were limited in activities because of physical, mental, or emotional problems, 20.3% had a health condition that requires special equipment, 8.4% had a physical, mental, or emotional condition that results in serious difficulty concentrating, remembering, or making decisions, 28.8% had serious difficulty walking or climbing stairs, 5.1% had difficulty dressing or bathing themselves, and 11% had difficulty doing errands alone such as visiting a doctor or shopping because of a physical, mental, or emotional condition.

### Mental, Cognitive, and Functional Health by Sexual Orientation

The first hypothesis was that mental, cognitive, and functional health would differ among older women by sexual orientation, with LGB women showing worse outcomes.

Complex sample logistic regression models were constructed for each outcome variable and included sociodemographic controls (Table 2). There were no differences by sexual orientation in relation to either frequent mental distress or being told by a provider that one has depression. However, lesbian/gay women had significantly greater odds of facing activity limitations due to a health issue (AOR = 2.33), 2.96 times greater odds of having difficulty walking or using stairs, and 2.41 times greater odds of needing help with IADLs. Bisexual women had 2.41 greater odds of facing cognitive limitations and 2.72 greater odds of needing help with IADLs compared to heterosexual women.

### Age as a Moderator of Health Disparities

The second hypothesis was that sexual minority women would show significantly greater rates of cognitive and

**Table 1.** Sociodemographic Characteristics of 2015 BRFSS Female Respondents, Aged 65 and Older, by Sexual Orientation Using Weighted Data

	Heterosexual (N = 34,361)	Lesbian or gay (N = 158)	Bisexual (N = 188)	Pearson $\chi^2$
Total <sup>a</sup>	98.9%	0.5%	0.5%	
Age, years				76.634***
65–69	31.6%	59.5%	35.1%	
70–74	23.9%	18.1%	19.3%	
75–79	20.4%	12.4%	15.5%	
80+	24.1%	10.0%	30.1%	
Race/ethnicity				73.58
White only, non-Hispanic	83.3%	89.4%	66.4%	
Black only, non-Hispanic	9.6%	3.4%	22.1%	
Other race, non-Hispanic	2.3%	6.0%	1.7%	
Multiracial, non-Hispanic	0.8%	1.2%	0.4%	
Hispanic	3.9%	—	9.4%	
Educational attainment				103.43***
Less than Grade 12	13.4%	17.0%	23.4%	
Grade 12 or GED	35.7%	18.5%	25.3%	
Some college or technical school	31.0%	21.2%	22.8%	
College grad	19.9%	43.4%	28.5%	
Household income per year				24.67
<\$25,000	35.1%	35.1%	43.5%	
\$25,000–\$49,999	33.5%	24.3%	30.6%	
\$50k–\$74,999	14.5%	11.6%	11.5%	
\$75,000 or more	16.9%	29.1%	14.4%	
Employment status				42.80
Employed	12.8%	19.2%	16.8%	
Unemployed	1.3%	—	0.8%	
Retired/not in labor force	81.5%	68.7%	80.8%	
Unable to work	4.4%	12.1%	1.6%	
Home ownership				0.01
Own	87.3%	87.1%	87.2%	
Rent or other arrangement	12.7%	12.9%	12.8%	
Health insurance				170.01***
Yes	98.7%	99.3%	87.3%	
No or don't know	1.3%	0.7%	12.7%	

Note: A Bonferroni correction was made to the *p*-values based on the number of chi-square tests run; only *p*-values <.007 are reported.

<sup>a</sup>The sexual orientation measure included a response option of “Other,” which was the response of 0.6% (*n* = 146) of women aged 65 and older in states asking this question. These respondents were not included for the calculations within this table.

\**p* < .05. \*\**p* < .01. \*\*\**p* < .001.

functional limitations among the younger cohorts (women in their late 60s or 70s) compared to heterosexual women. To assess this question, the same logistic regression models were calculated, but were run separately by age group (ages 65–69; 70–79; and 80+). Because these models had smaller sample sizes, lesbian/gay and bisexual women were combined into one group (“sexual minority”).

As displayed in Table 3, sexual minority women aged 65–69 had two times greater odds of facing activity limitations, 2.93 greater odds of having difficulty walking or using stairs, and 3.03 times greater odds of having difficulty with IADLs than heterosexual women of this age group. Among women in their 70s, sexual minority women faced greater odds of cognitive limitations (AOR = 3.78)

and needing help with IADLs (AOR = 3.05) compared to heterosexual women. There were no significant differences in cognitive or functional health between sexual minority and heterosexual women who were aged 80 and above.

### Socioeconomic Status and Race/Ethnicity as Moderators of Health Disparities

For the final hypothesis, logistic regression models were constructed for each outcome variable, with sexual minority status indicated using one dummy variable (LGB were combined into one group). The hypothesis was that differences in outcomes would be moderated by socioeconomic status (income, educational attainment) across the board

**Table 2.** Multivariate Logistic Regression Models for Mental, Cognitive, and Functional Health by Sexual Orientation for Females, Aged 65 and Older

	Freq. mental distress (N = 25,824)	Told depressed (N = 26,181)	Activity limitations (N = 26,101)	Uses special equipment (N = 26,231)	Cognitive limitation (N = 26,125)	Difficulty walking/stairs (N = 26,120)	Needs help with ADL (N = 26,224)	Needs help with IADL (N = 26,174)
	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)
Lesbian	1.92 (0.86–4.25)	0.88 (0.47–1.64)	2.33** (1.37–3.97)	1.48 (0.76–2.91)	1.11 (0.49–2.53)	2.96*** (1.72–5.09)	0.40 (0.13–1.22)	2.41* (1.09–5.35)
Bisexual	2.24 (0.94–5.31)	1.89 (0.97–3.69)	1.11 (0.62–1.96)	0.72 (0.38–1.40)	2.41* (1.01–5.76)	1.06 (0.53–2.14)	0.53 (0.21–1.36)	2.72* (1.11–6.65)
Early 70s	0.87 (0.69–1.08)	0.72*** (0.62–0.83)	0.91 (0.80–1.03)	1.07 (0.90–1.27)	0.95 (0.74–1.21)	1.03 (0.90–1.18)	0.74 (0.54–1.02)	0.93 (0.75–1.17)
Late 70s	0.84 (0.65–1.10)	0.59*** (0.50–0.70)	1.06 (0.92–1.23)	1.38*** (1.15–1.65)	0.97 (0.73–1.29)	1.29** (1.10–1.51)	0.98 (0.69–1.38)	1.24 (0.97–1.58)
80+	0.50*** (0.39–0.64)	0.37*** (0.31–0.44)	1.10 (0.96–1.26)	2.66*** (2.24–3.15)	1.12 (0.87–1.44)	1.63*** (1.41–1.88)	1.33 (0.97–1.84)	2.31*** (1.85–2.88)
Income	0.68*** (0.61–0.76)	0.80*** (0.75–0.86)	0.78*** (0.74–0.83)	0.72*** (0.67–0.77)	0.60*** (0.53–0.67)	0.70*** (0.66–0.75)	0.64*** (0.55–0.75)	0.65*** (0.58–0.72)
Household size	1.10* (1.01–1.20)	1.04 (0.82–1.32)	1.06 (1.00–1.12)	1.01 (0.81–1.27)	1.04 (0.95–1.13)	1.09** (1.03–1.16)	1.09 (0.99–1.21)	1.13*** (1.05–1.22)
HS diploma or less	1.22* (1.02–1.46)	1.01 (0.90–1.14)	0.79*** (0.71–0.88)	0.92 (0.81–1.05)	1.30*** (1.07–1.58)	1.20** (1.07–1.34)	1.22 (0.95–1.57)	1.11 (0.93–1.32)
Rents home	1.49*** (1.22–1.84)	1.63*** (1.40–1.89)	1.53*** (1.34–1.74)	1.97*** (1.71–2.26)	1.36*** (1.12–1.66)	1.78*** (1.57–2.03)	1.72*** (1.35–2.19)	1.72*** (1.44–2.05)
Person of color	0.82 (0.63–1.07)	0.52*** (0.43–0.64)	0.72*** (0.62–0.84)	1.31** (1.10–1.55)	1.17 (0.91–1.51)	1.23* (1.05–1.45)	1.57*** (1.19–2.07)	1.40*** (1.14–1.73)

Notes: The models for depression, activity limitations, and uses special equipment include the inverse of respondent's household size rather than the original household size variable to address model assumption violations regarding linearity in the logit. ADL = activities of daily living; IADL = instrumental activities of daily living; AOR = adjusted odds ratio; CI = confidence interval.  
 \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

and by race/ethnicity for cognitive and functional health, such that those of lower SES and women of color would have greater health struggles. To test this hypothesis, one series of models had an interaction term for sexual minority by annual income; the second series of models had an interaction term for sexual minority by education level (HS diploma or less); the third series had an interaction between sexual minority by race/ethnicity (person of color).

Annual income was a significant moderator only in the model for being told that one has depression (Table 4). Supplementary Figure 2 provides a graphical representation of this model, pointing to the differing patterns between income and depression diagnosis between straight and heterosexual older women. As can be seen in this display, for heterosexual women, higher household income tends to relate to a lower likelihood of being told that they have depression. For lesbian and bisexual women, their likelihood of a depression diagnosis is similar to heterosexual women at lower incomes, but increases in probability as annual household income increases.

Educational attainment was a moderator only for two models: frequent mental distress and activity limitations (Table 4). Surprisingly, older women who were sexual minorities and had a high school diploma or less education had 4.17 (number is the inverse odds ratio:  $1/0.24 = 4.17$ .) times lower odds of frequent mental distress than older sexual minority women with at least some college education. Similarly, sexual minority women with a high school diploma or less education had 3.23 times lower odds of facing activity limitations due to a health condition than sexual minority women with at least some college education.

Being a person of color had a moderating effect on sexual orientation disparities related to several measures of functional health (Table 5). Older sexual minority women of color had 7.14 times lower odds of facing activity limitations due to a health problem and 5 times lower odds of using special equipment compared to older white sexual minority women. Although race/ethnicity was not expected to be a moderator for mental health disparities, it was found to moderate the relationship to frequent mental distress, with older sexual minority women of color having 4.17 lower odds of frequent mental distress than older white sexual minority women.

## Discussion

This study set out to analyze possible disparities in mental, cognitive, and functional health by sexual orientation among women aged 65 and older using population-based data. As hypothesized, after controlling for sociodemographic factors, older sexual minority women were more likely to report problems with cognitive health and functional health than their heterosexual peers. Lesbian/gay women demonstrated poorer functional health, and

**Table 3.** Comparison of Cognitive and Functional Health by Age Group and Sexual Orientation

	Activity limitations	Uses special equipment	Cognitive limitation	Difficulty walking/stairs	Needs help with IADL
	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)
Late 60s	(N = 8,772)	(N = 8,817)	(N = 8,791)	(N = 8,797)	(N = 8,805)
Sexual minority	2.03* (1.04–3.93)	0.98 (0.39–2.44)	1.14 (0.46–2.80)	2.93** (1.54–5.57)	3.03* (1.10–8.29)
70s	(N = 11,497)	(N = 11,553)	(N = 11,488)	(N = 11,494)	(N = 11,526)
Sexual minority	1.71 (0.96–3.05)	1.23 (0.60–2.54)	3.78** (1.50–9.54)	1.30 (0.69–2.47)	3.05* (1.19–7.79)
80s+	(N = 5,832)	(N = 5,871)	(N = 5,846)	(N = 5,829)	(N = 5,843)
Sexual minority	0.74 (0.35–1.56)	0.85 (0.35–2.10)	0.96 (0.30–3.02)	1.10 (0.46–2.58)	1.64 (0.60–4.46)

Notes: Models include controls for income, household size, education level, home ownership, and race (white/person of color), though not displayed here. The models for activity limitations and uses special equipment include the inverse of respondent's household size due to model assumption violations regarding linearity in the logit. Due to model errors with small cell sizes, college education was not used as a control for the uses special equipment model for those in their 70s. ADL = activities of daily living; IADL = instrumental activities of daily living; AOR = adjusted odds ratio; CI = confidence interval.

\* $p < .05$ . \*\* $p < .01$ .

**Table 4.** Models with Significant Sociodemographic Interaction Terms: Income and Educational Attainment

Moderating effect of income		Moderating effect of educational attainment	
	Told depressed (N = 26,210)		Freq. mental distress (N = 25,824)
	AOR (95% CI)		AOR (95% CI)
Sexual minority	0.52 (0.17–1.59)	Sexual minority	3.48*** (1.78–6.80)
Income	0.85*** (0.79–0.90)	HS diploma or less	1.20 (1.00–1.44)
Sexual minority × Income	1.53* (1.03–2.28)	Sexual minority × HS diploma or less	0.24* (0.08–0.76)
			Activity limitations (N = 26,101)
			AOR (95% CI)
			2.43*** (1.57–3.77)
			0.81*** (0.73–0.90)
			0.31* (0.12–0.80)

Notes: HS = high school. Although not displayed, the income model controls for age, household size, home ownership, and race (white/person of color), and the educational attainment model controls for age, income, household size, home ownership, and race (white/person of color). The models for depression and activity limitations include the inverse of respondent's household size due to model assumption violations regarding linearity in the logit. AOR = adjusted odds ratio; CI = confidence interval.

\* $p < .05$ . \*\*\* $p < .001$ .

**Table 5.** Models With Significant Race/Ethnicity Interaction Term

	Freq. mental distress (N = 25,824)	Activity limitations (N = 26,101)	Uses special equipment (N = 26,231)
	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)
Sexual minority	2.67** (1.45–4.93)	2.19*** (1.47–3.26)	1.31 (0.79–2.15)
Person of color	0.90 (0.69–1.16)	0.73*** (0.63–0.85)	1.20* (1.01–1.42)
Sexual minority × Person of Color	0.24* (0.06–0.98)	0.14*** (0.05–0.40)	0.20** (0.06–0.67)

Notes: Although not displayed, these models control for age, income, household size, home ownership, and education level. The models for activity limitations and uses special equipment include the inverse of respondent's household size due to model assumption violations regarding linearity in the logit. AOR = adjusted odds ratio; CI = confidence interval.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

bisexual women had poorer functional and cognitive health. Other studies have similarly indicated disparities affecting functional health among sexual minority women aged 50 and older (Fredriksen-Goldsen et al., 2013; Gonzales & Henning-Smith, 2015). Disparities in cognitive and functional health by sexual orientation indicate a need for targeted social services that can support sexual minority women as they age, as well as access to

gerontologists and health care providers who are willing, able, and competent to serve this population (Fredriksen-Goldsen, Hoy-Ellis, Goldsen, Emlet, & Hooyman, 2014; Wallace et al., 2011). Given that findings suggest that sexual minority women may face greater difficulties with IADLs, this population may benefit from services that can help them maintain their health and execute tasks such as visiting the doctor, running errands, and completing home



repairs, particularly among women with fewer social supports and weaker community ties.

Contrary to the hypothesis, older lesbian and bisexual women's mental health was not statistically different than that of older straight women. This contrasts with previous research that has indicated greater rates of psychological distress and poor mental health among middle age and older sexual minority women (Fredriksen-Goldsen et al., 2013; Gonzales & Henning-Smith, 2015; Wallace et al., 2011). Perhaps the measures used in the BRFSS (number of days of poor mental health and being told by a health care provider that one has depression) are not the best for capturing mental health concerns of this population. However, it is possible that this finding reflects a true lack of difference in mental health between older sexual minority and heterosexual women. Perhaps health differences that occur earlier in life are lessened with age as women develop more effective coping strategies.

Results from the present study indicate that age moderated health disparities by sexual orientation. Some disparities in functional health were notable among women in their late 60s, with lesbian and bisexual women more likely to face activity limitations, have difficulty walking/using stairs, and needing help with IADLs. For women in their 70s, lesbian and bisexual women were more likely than heterosexual women to face cognitive limitations and need help with IADLs. Such patterns suggest the possibility of accelerated aging among LGB women, which can bring health challenges at earlier time points in the life-course. There may be a need for targeted support to LGB adults for health and aging-related services much earlier than age 65. These findings may also reflect differences by birth cohort due to the cross-sectional nature of the BRFSS. At the time of this study, the first wave of Baby Boomers was just reaching age 70, so patterns that look different between those in their late 60s compared to others may relate to generational patterns and shared history.

This study found no disparities in cognitive or functional health by sexual orientation among women aged 80 and older. This may be connected to the fact that people who live to at least age 80 may be among the most healthy and resilient in their cohorts, making health disparities seem less prominent among the oldest women. Additionally, those who are aged 80 and older may have experienced being LGB very differently than their younger peers, including going through adolescence and early/middle adulthood during a time when LGB identities were pathologized and criminalized; however, one might theorize that this would lead to these older cohorts facing *greater* health disparities than younger cohorts of LGB adults, which did not pan out here. Yet, if LGB adults of older cohorts face greater health disparities, they may also face early mortality, meaning that they would not be captured in the 80+ age cohort of this survey.

Unlike hypothesized, this study found only a few indications that socioeconomic status moderated health

disparities by sexual orientation. For most of the outcomes examined, findings suggest that patterns of health disparities by sexual orientation are relatively consistent regardless of one's socioeconomic status, with those of lower socioeconomic status facing greater chance of poor health. Given that this study focused exclusively on women aged 65 and older, it is possible that protective social policies such as Social Security and Medicare may buffer the impact of poverty on health for this population. Findings that were statistically significant in relation to socioeconomic status as a moderator occurred in the opposite direction than was expected. First, income moderated the relationship between sexual minority identity and likelihood of being told that one was depressed. While for the overall sample of women, higher income was related to a lower likelihood of being told that one was depressed, for LGB women, those with higher incomes faced greater likelihood of being told that they were depressed. One possibility is that this may be connected to lifetime access to health care: LGB women with higher income may also have greater access to health providers across the life course than those with lower income, thus impacting the likelihood of being told that they were depressed by a provider. This assumes that a subset of LGB women of lower income may have depression that has gone undiagnosed due to lower health care access. This finding indicates that higher income may not be as protective against depression for older LGB women as it may be for heterosexual women; there is thus great importance of ensuring that LGB women of all incomes have access to mental health care.

Only frequent mental distress and activity limitations were moderated by a woman's educational attainment, with both models indicating that LGB women with less than a college education had better outcomes than LGB women with at least some college education. Sexual minority women who have less formal education may be developing strategies of resilience that lower their risks of frequent mental distress and activity limitations compared to their peers with more education. Another possibility is that LGB women with less education—even if they are having a difficult time with their health—may be less inclined to say that they are struggling due to perceived stigma; indeed, in the overall sample, women with less education were less likely to say that they faced activity limitations than those who had some college education. These findings deserve further study in future research with LGB older women.

Some surprising results appeared in relation to how race/ethnicity moderated health disparities. Although race/ethnicity was not hypothesized to moderate relationships to mental health outcomes, findings suggest that sexual minority women of color were less likely to experience frequent mental distress than white sexual minority women. For some functional health dimensions (activity limitations and use of special equipment), sexual minority women of color also reported better health compared to white sexual minority women. There are numerous possible reasons

for these findings, including strategies of resilience among older sexual minority women of color (Woody, 2015), cultural differences in acknowledging or perceiving disability or behaviors that attenuate health risks (Fuller-Thompson, Brennenstuhl, & Hurd, 2011; McCallion, Janicki, & Grant-Griffin, 1997), and earlier mortality of women of color who have the poorest health. Additional research is needed in this area, particularly studies that oversample sexual minority women of color to tease out differences between racial and ethnic subgroups.

## Limitations

Only 21 states included the SOGI module in their 2015 BRFSS, and results cannot be generalized to states not asking these questions, including a number of states in the Southeast and West Coast regions. Secondly, this was a cross-sectional survey, so one cannot draw conclusions from these findings about how disparities develop or change for women over the life-course. There is a need for longitudinal research, such as that being conducted through the Aging with Pride project (Fredriksen-Goldsen, Kim, et al., 2017), as well as studies that might follow both heterosexual and LGB adults to compare both groups. Thirdly, respondent sex is generally assumed by BRFSS interviewers and only asked if the interviewer feels uncertain about the respondent's sex. A better practice would be to explicitly ask this question of respondents, in addition to asking a question about whether one is transgender. Finally, this study did not examine the health of transgender older adults, but future research is needed related to this population.

## Implications

Findings from this study add to the evidence base regarding health disparities among sexual minority women. Such disparities occur across cognitive and functional health outcomes for older sexual minority women, with some differences between lesbian and bisexual women. Gerontologists and social services providers need to be prepared for meeting the needs of this growing population. There may be a benefit of having gerontological services that particularly target sexual minority older adults—especially in areas with a high density of LGB people—given their unique needs compared to heterosexual older adults. This research supports the recommendations of other scholars regarding the value of ensuring adequate training and LGB competency among aging services providers (Fredriksen-Goldsen et al., 2014; Seelman, Adams, & Poteat, 2017; Wallace et al., 2011), particularly in terms of long-term services and supports, given that sexual minority women experienced greater problems with cognitive and functional health and may need additional supports with IADLs. Such services can present risks for discrimination that negatively impact LGB older adults and may force them back into the closet, so LGB competency among

long-term care providers is of the utmost importance (Czaja et al., 2016; Seelman et al., 2017). Additionally, there is a need for policies and funding at federal and state levels that acknowledge the presence of sexual minority older adults and the unique health risks that this population faces.

## Supplementary Material

Supplementary data are available at *The Gerontologist* online.

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