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The Physical and Mental Health of Lesbian, Gay Male, and Bisexual (LGB) Older Adults: The Role of Key Health Indicators and Risk and Protective Factors

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Purpose: Based on resilience theory, this paper investigates the influence of key health indicators and risk and protective factors on health outcomes (including general health, disability, and depression) among lesbian, gay male, and bisexual (LGB) older adults. **Design and Methods:** A cross-sectional survey was conducted with LGB older adults, aged 50 and older ($N = 2,439$). Logistic regressions were conducted to examine the contributions of key health indicators (access to health care and health behaviors), risk factors (lifetime victimization, internalized stigma, and sexual identity concealment), and protective factors (social support and social network size) to health outcomes, when controlling for background characteristics. **Results:** The findings revealed that lifetime victimization, financial barriers to health care, obesity, and limited physical activity independently and significantly accounted for poor general health, disability, and depression among LGB older adults. Internalized stigma was also a significant predictor of disability and depression. Social support and social network size served as protective factors, decreasing the odds of poor general health, disability, and depression. Some distinct

differences by gender and sexual orientation were also observed. **Implications:** High levels of poor general health, disability, and depression among LGB older adults are of major concern. These findings highlight the important role of key risk and protective factors, which significantly influences health outcomes among LGB older adults. Tailored interventions must be developed to address the distinct health issues facing this historically disadvantaged population.

Key Words: Minority health, LGB, Resilience, Disability, Depression

As the U.S. population is becoming older, it is increasingly diverse (Vincent & Velkoff, 2010). There are currently more than 2 million older adults in the United States that identify as lesbian, gay, or bisexual (LGB; Cahill, South, & Spade, 2000). Given the tremendous proportional growth of the age 50 and older population in the next two decades, the number of LGB older adults will more than double and likely exceed 6 million by 2030 (Cahill et al., 2000; Fredriksen-Goldsen, 2007a). Despite this tremendous growth, there is a paucity

of research addressing the health and aging needs of LGB older adults. The Institute of Medicine (IOM, 2011) identifies LGB older adults as an at-risk and under-served population.

Older adults from socially and economically disadvantaged populations are at risk of poor physical and mental health (Centers for Disease Control and Prevention [CDC] & Merck Company Foundation, 2007). Health disparities have been defined as differences in health resulting from systematic social, economic, and environmental disadvantage (U.S. Department of Health and Human Services, 2011). Health disparities related to sexual orientation have been identified as one of the most pronounced gaps in health research (CDC, 2011), with health research of LGB older adults largely absent (Fredriksen-Goldsen & Muraco, 2010).

In one of the first studies utilizing population-based data to examine the health of LGB older adults, findings reveal that common health disparity patterns exist (Fredriksen-Goldsen et al., 2011). Compared to their heterosexual counterparts, LGB older adults face an elevated risk of disability and mental distress, are more likely to smoke and engage in excessive drinking, and are less likely to be partnered or married. Important differences by gender are also evident among LGB older adults (Fredriksen-Goldsen et al., 2011). Older lesbian and bisexual women have an elevated risk of cardiovascular disease and obesity, whereas older gay and bisexual men are at higher risk of poor physical health and living alone. Data from the California Health Interview Survey indicate that, as compared to their heterosexual counterparts, LGB adults aged 50–70 years have higher rates of diabetes, high blood pressure, physical limitations, and self-reported poor health (Wallace, Cochran, Durazo, & Ford, 2011). These emerging studies identify LGB older adults as a health-disparate population with heightened risks of poor health outcomes, yet critical gaps persist in our understanding of the social determinants affecting health in these communities.

Conceptual Framework

To better understand how key health indicators and risk and protective factors affect the health of LGB older adults, we utilized a resilience conceptual framework. Resilience is defined as the beneficial behavioral patterns, functional competence, and cultural capacities that individuals, families, and communities utilize under adverse circumstances

(Fredriksen-Goldsen, 2007b). Emerging from the field of positive psychology, resilience theory posits that individuals can exemplify characteristics that reflect the “process of, capacity for, or outcomes of successful adaptation, despite challenging or threatening circumstances” (Masten, Best, & Norman, 1990, p. 426).

The underpinnings of resilience theory are based on the understanding that resilience is a dynamic process involving the interplay of risk and protective factors (Yates & Masten, 2004). Resilience theory is well suited to inform our understanding of the life experiences of older adults in general and LGB older adults in particular. This conceptual framework places life experiences in the context of opposing influences, including competence and adversity as well as assets and risks (Yates & Masten, 2004). Competence is conceptualized as the adaptive use of resources; adversity is considered the negative experience that can disrupt adaptive functioning.

The resilience conceptual framework used in this study has five components: (1) background characteristics (including sexual orientation, gender, age, income, education, and race/ethnicity); (2) key health indicators (including access to health care and health behaviors); (3) risk factors (including lifetime victimization, internalized stigma, and sexual identity concealment); (4) protective factors (including social support and social network size); and (5) health outcomes (general health, disability, and depression). Based on resilience theory, we will examine the relationship between background characteristics, key health indicators, and risk and protective factors as they predict health outcomes of LGB older adults. In this study, we are focusing on three health outcomes because existing evidence suggests that risk and protective factors may influence health outcomes differently and with differing intensities (Hughes & Waite, 2002). A resilience framework allows us not only to examine risk and protective factors as they affect LGB older adult health but also, equally important, to assess how risk and protective factors may exist differentially among subgroups of LGB older adults.

The resilience framework parallels the life experiences of many LGB older adults. Although many LGB individuals have developed a strong sense of community and mutual support and have rallied together to create supportive environments during trying times, such as the AIDS crisis of the 1980s and 1990s, they continue to experience relatively

high levels of discrimination and victimization (Fredriksen-Goldsen et al., 2011). Such adverse experiences may lead to internalized stigma and negative health consequences. According to Herek and colleagues (2009), sexual minorities are at risk of accepting and integrating negative societal values and attitudes; in turn, such internalized stigma may lead to concealment of one's sexual orientation, resulting in social isolation.

The impact of victimization, internalized stigma, and sexual identity concealment on mental health among LGB adolescents and adults in young and middle adulthood is well documented (Hatzenbuehler, 2009; Meyer, 2003). Although the prevalence of depression decreases with older age in the general population (Kessler, Birnbaum, Bromet, Hwang, Sampson, & Shahly, 2010), LGB older adults continue to face risks that may increase their vulnerability to mental health problems. Among LGB older adults, victimization related to sexual orientation is an important determinant of poor mental health (Grossman, D'Augelli, & O'Connell, 2001). Concealment of their sexual identity, likely influenced by both internalized stigma and victimization, can also prevent LGB individuals from opportunities to strengthen social relationships and interaction with other LGB adults. Such risks may also impede access to health care (Conron, Mimiaga, & Landers, 2010; Dilley, Simmons, Boysun, Pizacani, & Stark, 2010) and result in adverse health behaviors (Hatzenbuehler, 2009), likely increasing the risk of poor physical health among LGB older adults.

Increased social contacts, social network size, and social support are associated with better health among adults in the general population (Zaninotto, Falaschetti, & Sacker, 2009), and such social resources play a protective factor in the relationship between victimization and physical and mental health among older adults (Luo, Xu, Granberg, & Wentworth, 2011). The social relationships of LGB older adults differ from the general older adult population in part because many LGB older adults do not have children or legally recognized family members to help them (Fredriksen-Goldsen et al., 2011). LGB older adults report heavy reliance on unmarried partners and friends of similar age to provide help and caregiving assistance as they age (Beeler, Rawls, Herdt, & Cohler, 1999; Fredriksen-Goldsen, 2007a). Further investigation is needed regarding the role of such social resources as potentially protective factors influencing the health of LGB older adults.

A better understanding of the key health indicators and risk and protective factors affecting health outcomes of LGB older adults has important implications for developing and testing interventions to improve the health of our increasingly older and diverse population. The research hypotheses tested in this study include the following:

Key health indicators (access to health care and health behaviors) will be significant predictors of LGB older adults' poor general health, disability, and depression, after controlling for covariates. Risk factors (lifetime victimization, internalized stigma, and sexual identity concealment) will be significant predictors of LGB older adults' poor general health, disability, and depression, after controlling for covariates. Protective factors (social support and social network size) will reduce the likelihood of LGB older adults' poor general health, disability, and depression, after controlling for covariates.

Design and Methods

Sample

The Caring and Aging with Pride study was conducted through a collaboration with 11 agencies across the United States to better understand the physical and mental health of lesbian, gay, bisexual, and transgender (LGBT) older adults (see Fredriksen-Goldsen et al., 2011). Participating agencies distributed survey questionnaires with an invitation letter via agency contact lists to older adults, defined as aged 50 years and older, over a 6-month period from June to November 2010. Two reminder letters were sent as follow ups in subsequent 2-week intervals. The total *N* for the survey was 2,560, which includes both mail and electronic surveys, and represents the largest sample to date of LGBT older adults. A total of 2,201 mail surveys were returned for a response rate of 63%. For the agencies with electronic mailing lists, a similar internet-based survey was used following the same survey distribution protocol, with 359 electronic surveys returned.

For this analysis, we selected the LGB older adults for a sample size of 2,349, including 829 lesbian and bisexual older women and 1,520 gay and bisexual older men. Transgender participants were not included in this analysis because sexual orientation and gender identity are not mutually exclusive categories. The results based on transgender older adults are detailed in separate publications. All study procedures were reviewed and approved by the University of Washington Institutional Review Board.

Table 1. Description of Measures

Variables	Descriptions
Health outcomes	
Poor general health	Measured by a single item from the SF-8 (Ware, Kosinski, Dewey, & Gandek, 2001), “Overall, how would you rate your health during the past 4 weeks?” Responses were dichotomized: “fair, poor, or very poor” (= 1) and “excellent, very good, or good” (= 0).
Disability	Based on the definition from Healthy People 2010 (U.S. Department of Health and Human Services, 2000); participants were categorized as having a disability if they responded affirmatively to either of the following: (a) limited in activities because of physical, mental, or emotional problems or conditions; or (b) any health problems that require the use of special equipment, such as a cane, wheelchair, special bed, or special telephone (CDC, 2012).
Depression	The Center for Epidemiological Studies Depression Scale (CES-D), 10-item short form, was used to measure current depressive symptomology (Radloff, 1977). Summed scores were dichotomized with the standard cutoff score of 10 or higher (Andresen, Malmgren, Carter, & Patrick, 1994).
Health indicators	
Routine checkup	Assessed by asking participants whether or not they had a routine checkup within the past year (CDC, 2012).
Financial barriers to health care	Measured by asking participants whether or not they needed to see a doctor in the past year but could not because of cost (CDC, 2012).
Obesity	Body mass index (BMI) based on self-reported weight and height was calculated. BMI of 30 kg/m ² or higher was considered obese (CDC, 2010).
Smoking	Assessed by asking participants whether they had ever smoked 100 or more cigarettes and currently smoke every day or some days (CDC, 1994).
Excessive drinking	Measured by asking participants whether they had five or more drinks on one occasion during the past 30 days (Substance Abuse and Mental Health Services Administration, 2006).
Physical activities	Assessed by whether or not participants engaged in moderate activities for at least 10 minutes at a time, such as brisk walking, bicycling, vacuuming, gardening, or anything else that causes some increase in breathing or heart rate in a usual week (CDC, 2012).
Risk factors	
Lifetime victimization	Assessed with a 16-item measure based on the Lifetime Victimization Scale (D’Augelli & Grossman, 2001) and Discrimination Scale (Inter-University Consortium for Political and Social Research, 2010). Participants were asked how many times in their lives, due to their actual or perceived sexual orientation, they had experienced differing types of victimization including physical, verbal or sexual assault or threat; threat of outing; property damage; being hassled or ignored by police; job-related discrimination; denial of or inferior health care; and prevented from living in a neighborhood. A four-point Likert scale was used, with summed score ranging from 0 to 48 (Cronbach’s $\alpha = .86$).
Internalized stigma	Assessed by a five-item scale based on the Homosexual Stigma Scale (Liu, Feng, & Rhodes, 2009). Summary scores range from 1 to 4, with higher scores indicating higher levels of internalized stigma (Cronbach’s $\alpha = .78$).
Sexual identity concealment	Utilizing items from the Outness Inventory Scale (Mohr & Fassinger, 2000), sexual identity concealment was determined if any family member (mother, father, brothers, sisters, children) or best friend did not know of the participants’ sexual orientation.
Protective factors	
Social support	The four-item Social Support Scale (Sherbourne & Stewart, 1991) was used to measure the degree of perceived social support, with a range of 1 to 4, with higher scores indicating greater social support (Cronbach’s $\alpha = .85$).
Social network size	Assessed by asking participants how many friends, family members, colleagues, and neighbors they interact with in a typical month. The total size of social network was calculated and summarized by quartiles, with 1 indicating small social network (bottom 25%) and 4 indicating large social network (top 25%).
Background characteristics	
Standardized measures were used to assess background characteristics, including gender (0 = men, 1 = women), sexual orientation (0 = bisexual, 1 = gay or lesbian), age (in years), race/ethnicity (0 = African Americans, Hispanics, Asian or Pacific Islanders and others, 1 = non-Hispanic White), income (0 = above 200% of the federal poverty level [FPL], 1 = at or below 200% FPL), education (0 = some college or more, 1 = high school or less), and relationships status (0 = married or partnered, 1 = other). Participants were asked whether they had ever been told by a doctor that they had the following conditions: high blood pressure, high cholesterol, heart attack, angina, stroke, cancer, arthritis, diabetes, asthma, or HIV/AIDS. The number of chronic health conditions was summed, with a range of 0 to 10.	

Measures

In this study, we utilized standardized measures whenever possible, including measures of health outcomes, key health indicators, risk and protective factors, and background characteristics. Health outcomes were poor general health, disability, depression; key health indicators include a routine checkup, financial barriers to health care, obesity, smoking, excessive drinking, and physical activities; risk factors include lifetime victimization, internalized stigma, and sexual identity concealment; and protective factors include social support and social network size. Detailed information about measures is shown in [Table 1](#).

Analysis

Analyses were performed using STATA/IC for Windows (version 11.2). First, we described the distributions of background characteristics and examined the associations of background characteristics with gender and sexual orientation by applying chi-square tests for categorical variables and *t* tests for continuous variables. Gender and sexual orientation effects on key health indicators, risk and protective factors, and health outcomes were examined using logistic or linear regression, after adjusting for age, income, education, and race/ethnicity. Next, we conducted separate logistic regressions ([Agresti, 2002](#)) to assess the contributions of key health indicators and risk and protective factors as they predict each health outcome. With each outcome variable, we utilized three logistic regression models. All models included background characteristics (sexual orientation, gender, age, income, education, race/ethnicity, and number of chronic conditions) as control covariates. Model 1 included key health indicators; Model 2 included key health indicators and risk factors; and Model 3 included key health indicators, risk factors, and protective factors. No multicollinearity issues were detected when tested prior to conducting the multivariate logistic regression models.

Results

Sample Characteristics

The background characteristics of the LGB older adults in the sample are illustrated in [Table 2](#). The average age was 67 years. Eighty-seven percent was non-Hispanic White. Nearly one third of the LGB older adults had household income at

or below 200% of the federal poverty level (FPL). Bisexual older women and men were more likely to be at or below 200% of the FPL than older lesbians and gay men.

When controlling for age, income, education, and race/ethnicity, lesbian and bisexual older women were less likely to have an annual routine checkup and more likely to be obese than gay and bisexual older men. On the other hand, gay and bisexual older men, as compared to lesbian and bisexual older women, reported higher rates of smoking and excessive drinking, higher rates of lifetime victimization and more internalized stigma, and less social support and smaller social networks. When comparing by sexual orientation, bisexual older women and men reported a higher degree of internalized stigma and a higher likelihood of sexual identity concealment than older lesbians and gay men, when controlling for background characteristics. Bisexual older women also reported lower rates of physical activity and less social support than older lesbians. However, older lesbians showed a higher degree of lifetime victimization than bisexual older women.

Nearly one quarter (22%) of the LGB older adult participants reported poor general health, 45% had a disability, and 29% experienced depressive symptomology. Adjusting for age, income, education, and race/ethnicity, the rates of poor general health and depression were similar by gender and sexual orientation, except that lesbian and bisexual older women had higher rates of disability than gay and bisexual older men.

Predictors of Health Outcomes

Poor General Health.—Next, we conducted logistic regression analyses to assess the contributions of key health indicators, risk factors, and protective factors in succession as they predicted poor general health, disability, and depression when controlling for background characteristics, including sexual orientation, gender, age, income, education, race/ethnicity, and the number of chronic conditions. The results for poor general health are illustrated in [Table 3](#). All three models indicate that financial barriers to health care, smoking, and obesity increased the odds of poor general health for LGB older adults, whereas having an annual routine checkup and engaging in physical activities decreased the odds. The results of Model 2 indicate that, from among the risk factors, lifetime victimization and internalized

Table 2. Sample Characteristics by Sexual Orientation and Gender

	Men (n = 1,520)			Women (n = 829)			Gender difference
	Total (n = 2,349)	Gay (n = 1,453)	Bisexual (n = 67)	Total (n = 770)	Bisexual (n = 59)		
Background characteristics							
Age, years, M (SD)	66.88 (9.04)	67.97 (9.11)	69.63 (10.44)	64.76 (8.40)	64.51 (8.28)		t = 8.59***
Income, ≤200% FPL, %	29.21	28.46	46.77**	27.59	48.28**		χ ² = 0.00
Education, high school or below, %	7.68	8.46	10.45	5.76	10.34		χ ² = 4.56*
Non-Hispanic White, %	87.12	87.28	89.39	86.81	84.75		χ ² = 0.23
No. of chronic conditions, M (SD)	1.93 (1.43)	2.00 (1.46)	2.28 (1.41)	1.80 (1.38)	1.73 (1.31)		t = 3.57***
Health indicators							
Annual routine checkup, %	83.16	86.06	83.33	78.44	72.88		AOR = 0.63***
Financial barriers, %	6.34	5.64	8.96	7.01	11.86		AOR = 1.09
Smoking, %	8.69	9.23	7.69	7.25	15.25		AOR = 0.71*
Obesity, %	24.58	19.37	16.92	34.30	34.48		AOR = 2.15***
Excessive drinking, %	8.12	10.51	9.23	3.69	5.08		AOR = 0.28***
Physical activities, %	82.41	82.37	81.82	83.55	69.49**		AOR = 0.98
Risk factors							
Lifetime victimization, M (SD)	6.20 (6.99)	7.05 (7.31)	7.29 (8.16)	4.75 (6.07)	2.93 (4.42)**		b = -2.94***
Internalized Stigma, M (SD)	1.45 (.55)	1.52 (.58)	1.89 (.73)***	1.30 (.46)	1.54 (.57)***		b = -0.20***
Concealment, %	16.31	17.97	29.23*	12.45	24.14**		AOR = 0.88
Protective factors							
Social support, M (SD)	3.11 (.78)	3.02 (.81)	2.81 (.84)	3.30 (.68)	2.98 (.82)*		b = 0.25***
Social network-size, M (SD)	2.49 (1.11)	2.42 (1.12)	2.54 (1.25)	2.63 (1.09)	2.43 (1.17)		b = 0.18**
Health outcomes							
Poor general health, %	22.13	21.93	28.36	22.53	22.03		AOR = 1.01
Disability, %	45.49	41.69	53.03	52.57	50.85		AOR = 1.70***
Depression, %	29.00	29.64	34.92	27.26	35.09		AOR = 0.89

Notes: AOR = adjusted odds ratio; b = unstandardized coefficient. Comparisons of background characteristics are unadjusted, and comparisons for health outcomes, key health indicators, risk factors, and protective factors are adjusted for socio-demographic variables (age, income, education, and race/ethnicity). Significant findings for comparisons by sexual orientation are indicated in the columns of bisexuals with asterisks; test statistics and their significance for comparisons by gender are shown in the right-most column.

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

Table 3. Logistic Regression Analysis of Poor General Health among LGB Older Adults

Variables	Model 1	Model 2	Model 3
	AOR	AOR	AOR
Health indicators			
Annual routine checkup	0.66*	0.67*	0.69*
Financial barriers	2.16**	1.86**	1.65*
Smoking	1.86**	1.87**	1.69*
Excessive drinking	0.84	0.80	0.84
Obesity	1.60**	1.58**	1.64**
Physical activities	0.58***	0.58***	0.62**
Risk factors			
Lifetime victimization	—	1.02*	1.02*
Internalized stigma	—	1.33*	1.17
Concealment	—	0.89	0.85
Protective factors			
Social support	—	—	0.75**
Social network size	—	—	0.86*

Notes: AOR = adjusted odds ratio; all the tested models controlled for gender, sexual orientation, age, income, education, race/ethnicity, and the number of chronic conditions.

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

Table 4. Logistic Regression Analysis of Disability among LGB Older Adults

Variables	Model 1	Model 2	Model 3
	AOR	AOR	AOR
Health indicators			
Annual routine checkup	0.98	1.00	1.01
Financial barriers	2.63***	2.08**	1.96**
Smoking	1.82**	1.81**	1.70**
Excessive drinking	1.01	0.93	0.95
Obesity	1.81***	1.82***	1.86***
Physical activities	0.59***	0.59***	0.62**
Risk factors			
Lifetime victimization	—	1.04***	1.04***
Internalized stigma	—	1.41**	1.30*
Concealment	—	1.33	1.29
Protective factors			
Social support	—	—	0.85*
Social network size	—	—	0.89*

Notes: AOR = adjusted odds ratio; all the tested models controlled for gender, sexual orientation, age, income, education, race/ethnicity, and the number of chronic conditions.

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

stigma were significantly associated with increased odds of poor general health. According to Model 3, protective factors additionally accounted for variance in poor general health. As the degrees of social support and social network size increased, the odds of poor general health decreased. After adding protective factors to the model, lifetime victimization remained significantly associated with poor general health, but internalized stigma did not.

Disability.—The results of logistic regression analyses to assess predictors of disability are shown in Table 4. All three models indicate that older lesbian and bisexual women were more likely to be disabled than gay and bisexual men; financial barriers to health care, smoking, and obesity increased the odds of disability although engaging in physical activities decreased the odds. In Model 2, lifetime victimization and internalized stigma additionally accounted for variance

in disability. As the extent of lifetime victimization and internalized stigma increased, the odds of disability also increased. In Model 3, although the addition of protective factors had little effect on the results of Model 2, both higher degrees of social support and social network size decreased the odds of disability.

Depression.—The results for depression are depicted in Table 5. In Model 1, financial barriers to health care and smoking increased the odds of depressive symptomology, whereas being engaged in physical activities decreased the odds. In Model 2, we assessed whether risk factors additionally accounted for the variance in depressive symptomology. As the extent of lifetime victimization and internalized stigma increased, the odds of depressive symptomology increased; lifetime victimization and internalized stigma remained significantly associated with depression, even after protective factors were added to the model (Model 3). Model 3 illustrates the additional contribution of protective factors in relation to depression. Higher degrees of social support and increased social network size decreased the odds of depressive symptomology. The effect of smoking was no longer significant after risks and protective factors were jointly added to the model. Obesity was not associated with depression in Models 1 and 2. When protective factors were added to Model 2, however, obesity increased the odds of depression, with the protective factors potentially having a suppression effect.

Discussion

The IOM (2011) recognized a critical need to better understand the health of LGB adults in later life. Based on resilience theory, the purpose of this study was to examine how key health indicators and risk and protective factors contribute to physical and mental health among LGB older adults. The high levels of poor general health, disability, and depression among the LGB older adult participants in the study are of major concern. These findings mirror those reported in population-based studies, documenting significant health disparities among LGB older adults compared to heterosexuals of similar age (Fredriksen-Goldsen et al., 2011; Wallace et al., 2011). The findings reveal that lifetime victimization, financial barriers to health care, obesity, and lack of physical activity among LGB older adults are significant predictors across the health outcomes, even after adjusting for background characteristics and other covariates. Internalized stigma was also a predictor of disability and depression. Social support and social network size emerged as significant protective factors, decreasing the odds of poor health outcomes.

We hypothesized that key health indicators, including the lack of access to health care and adverse health behaviors, would significantly predict LGB older adult health outcomes. As expected, reducing financial barriers to health care had a positive impact across the three health outcomes. Although smoking was a significant predictor of

Table 5. Logistic Regression Analysis of Depression among LGB Older Adults

Variables	Model 1	Model 2	Model 3
	AOR	AOR	AOR
Health indicators			
Annual routine checkup	0.77	0.78	0.86
Financial barriers	3.38***	2.70***	2.30***
Smoking	1.65**	1.66*	1.32
Excessive drinking	1.21	1.12	1.21
Obesity	1.28	1.28	1.32*
Physical activities	0.52***	0.53***	0.59**
Risk factors			
Lifetime victimization	—	1.03***	1.03**
Internalized stigma	—	1.77***	1.35**
Concealment	—	1.21	1.08
Protective factors			
Social support	—	—	0.45***
Social network size	—	—	0.82**

Notes: AOR = adjusted odds ratio; all the tested models controlled for gender, sexual orientation, age, income, education, race/ethnicity, and the number of chronic conditions.

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

poor general health and disability as hypothesized, the relationship between smoking and depression did not remain significant once protective factors were added in the model. The association between smoking and depression is well documented (Pasco et al., 2008), with a recent longitudinal study establishing a causal link between smoking and health (Boden, Fergusson, & Horwood, 2010). Our findings suggest that social support and social network size mediate the relationship between smoking and depression among LGB older adults.

Contrary to the hypothesis, excessive drinking was not a significant indicator of health outcomes in this study. Because we operationalized excessive drinking as five or more drinks per sitting as suggested by Substance Abuse and Mental Health Services Administration (2006), we may not have captured more episodic and less consistent drinking patterns among older adults that may be reflective of alcohol consumption among LGB older adults. Another interesting finding is that social support and social network size seem to suppress the relationship between obesity and depression among LGB older adults in the study. The results of the multivariate logistic regression indicate that the negative impact of obesity on depression was significant when controlling for social network size. In fact, the bivariate analyses indicate that obese LGB older adults in the sample had larger social networks than those who were not obese (data not shown). Evidence suggests that obesity may spread across social networks (Christakis & Fowler, 2007). Further research examining these relationships among LGB older adults is desperately needed, with particular attention to the elevated rates of obesity among lesbian and bisexual older women.

We also hypothesized that risk factors, including lifetime victimization, internalized stigma, and sexual identity concealment, would additionally account for poor general health, disability, and depression among LGB older adults, after controlling for covariates. Lifetime victimization was associated with poor health across the three outcomes, with the LGB older adult participants experiencing victimization on average about six times in their lives. Lesbians, gay men, and bisexual women and men are more likely than heterosexuals to report discrimination, and the odds of having mental health problems are significantly increased for those with high levels of discrimination (Mays & Cochran, 2001). Emerging evidence suggests that the chronic strains associated with multiple forms

of victimization among racial and ethnic minorities may lead to cumulative physical and mental health symptoms (Williams & Mohammed, 2009). The findings presented here suggest that lifetime victimization continues to have deleterious and lasting effects on the lives of LGB older adults.

Clearly, overt risks emanating from the larger social context, such as victimization, have negative health consequences, but the findings related to internalized risks are less clear. Internalized stigma was associated with increased disability and depression, but not poor general health, among the LGB older adults in this study. We know from HIV literature that stigma has been significantly associated with poor mental health (Logie & Gadalla, 2009), depression (Vanable, Carey, Blair, & Littlewood, 2006), and negative self-image (Emlet, 2007). In this study, internalized stigma was also found to be associated with increased disability. However, the directionality of this relationship is less clear, which may require further examination in future research. Because we cannot ascertain causal or temporal linkages in this study, it may be that increased disability affects self-image, resulting in greater experiences of internalized stigma. It is also important to note that internalized stigma was not associated with poor general health in the final model. Although it was found to be significant in the first two models, the relationship was mitigated by social support and social network size.

Sexual identity concealment was not found to be associated with the health outcomes in this study. Serovich (2001) suggests that disclosure is weighed by examining what one anticipates resulting from the disclosure—which may be either positive or negative consequences. It was possible that for many of LGB older adult participants in the study it may have been more beneficial to openly identify their sexual identity and risk the potential outcomes of that disclosure. For those concealing their sexual identities, it too may reflect a risk-and-benefit analysis, with a reduction in risk given the reasons supporting non-disclosure rather than open self-identification.

We also predicted that protective factors, including social support and social network size, would reduce the likelihood of LGB older adults' poor general health, disability, and depression. Social support has been shown to have positive influences on the health of older adults in the general population (Berkman, Glass, Brissette, & Seeman, 2000; Hsu & Jones, 2012), and such support may be especially important for LGB adults as they age, as they are more likely to rely upon partners and

friends to provide informal caregiving (Fredriksen-Goldsen, 2007a; Metlife Mature Market Institute & American Society on Aging, 2010). In addition to social support, social network size also serves as a protective factor in relation to poor physical health, disability, and depression. As Stephens and colleagues (2011) point out, social networks are the social structure that provides the often-needed support. Social networks are an important consideration in LGB aging as we know from previous research that older LGB adults are less likely to have children and less likely to be living with life partners than are older heterosexuals (Butler, 2006; Fredriksen-Goldsen et al., 2011). Although prior research suggests that LGB older adults who rely upon friends to provide informal care may find themselves without adequate care when their need becomes too great (Muraco & Fredriksen-Goldsen, 2011), some have suggested that LGB older adults may have a social advantage due to well-developed social networks (Butler, 2006).

In this study, some significant subgroup differences were revealed by both gender and sexual orientation, demonstrating unique patterns of risk that warrant additional attention. The elevated risks of disability, obesity, and lack of routine checkup among lesbians and bisexual women found in previous studies (Brault, 2008; Reynolds, Saito, & Crimmins, 2005; Okoro, Strine, Young, Balluz, & Mokdad, 2005) were also observed among the lesbian and bisexual older women in this study. On the other hand, gay and bisexual older men in this study, as compared to lesbian and bisexual older women, experience other elevated risks, including higher rates of smoking and excessive drinking, increased levels of lifetime victimization and internalized stigma, less social support, and smaller social networks. In the gerontological literature, older women generally have increased social support as compared to older men (Stephens et al., 2011), and this pattern persists among the LGB older adults in this study. Yet, in the general population, older women are much more likely to live alone than older men; however, among LGB older adults, older gay and bisexual men are significantly more likely to live alone than are lesbian and bisexual older women (Fredriksen-Goldsen et al., 2011). Further research is needed to examine how such gender disparities in health indicators and risk and protective factors affect health outcomes, such as disability, over time.

Important differences by sexual orientation are also evident, with older bisexual women and men

experiencing significantly higher levels of internalized stigma and sexual identity concealment, and lower levels of social support than lesbian and gay older adults. Although social support emerged as a protective factor against depression and poor physical health, such resources appear to be less available for bisexual older adults, who may not experience a sense of community and group identity. It may also be that bisexual older adults do not disclose their identity unless they are in a same-sex relationship. Pinel (1999) suggests that stigma consciousness can be linked to a lower sense of group identity and how one perceives oneself as being similar to other group members. Bisexuals may also experience a lack of community support due to negative perceptions of bisexuality in lesbian and gay communities (Lang, 2008). These disparate findings by both gender and sexual orientation reinforce the notion that LGB older adults comprise heterogeneous populations and it is important to guard against making generalizations that mask between group differences.

Although this study highlights important findings regarding the health of LGB older adults, several limitations must be considered. Because the participants were recruited via agency lists, service users are likely over-represented. It is possible that older LGB adults who are not connected with agencies have different experiences and may, in fact, be more or less socially isolated than the participants in the study. This research addresses the health of sexual minorities who self-identify as lesbian, gay, or bisexual, and may not include those who do not self-identify but may engage in sexual behavior with same or both sexes. Although the sample is large and geographically and demographically diverse, it is a nonrepresentative sample and the findings are not generalizable to the broader population of LGB older adults. Because the agencies are primarily located in large urban areas, LGB older adults residing in rural areas are likely under-represented. The cross-sectional aspect of the study also limits the understanding of the health and aging of LGB adults. Our results reflect data collected at one point in time, and future studies would benefit by collecting longitudinal data that can trace aging and health trajectories over time.

Conclusion

Resilience theory provides a lens through which to examine the health of LGB older adults as a

health-disparate population. This study identifies key health indicators and risk and protective factors that significantly predict LGB older adults' general health, disability, and depression. In order to develop effective interventions for this population, it will be important to address both the common health risks faced by older adults in general as well as the unique risk and protective factors affecting LGB older adults in particular, including elevated rates of lifetime victimization, increased stigma, and distinct social support networks. Recognizing the increasing diversity of our society is a first step to promote health equity and improve health for all older adults.

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