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Health-related Quality of Life Among Black Sexual Minority Women

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Abstract

Introduction: It is well established that socially marginalized groups experience worse health than dominant groups. However, many questions remain about the health of members of multiple marginalized groups, such as black sexual minority women. The purpose of this study was to examine the relationship between health-related quality of life (HRQOL), race, and sexual orientation identity among a general population sample of black and white women and to assess additive interaction between sexual orientation identity and race.

Methods: This study used cross-sectional 2014 and 2015 Behavioral Risk Factor Surveillance System data from 154,995 women residing in 20 U.S. states. G-computation was used to estimate age-adjusted prevalence differences for nine dichotomized measures of HRQOL. The HRQOL of black sexual minority women was compared with the HRQOL of black heterosexual women, white sexual minority women, and white heterosexual women. Analyses were conducted in 2017.

Results: Age-adjusted prevalence differences for all measures suggested worse HRQOL among black sexual minority women, compared with most of the other groups (e.g., frequent poor mental health comparing black lesbian and heterosexual women: 0.083, 95% CI= -0.017, 0.183); HRQOL among black bisexual women was often similar to or worse than white bisexual women. Most prevalence differences comparing black sexual minority women with white heterosexual women suggested additive interaction that led to stronger or weaker associations than expected. Although many point estimates suggested meaningful differences, many 95% CIs for prevalence differences, and when assessing for interaction, included 0.

Conclusions: Having two marginalized identities, compared with one, is often associated with worse HRQOL. In addition, race and sexual orientation identity may interact in their relationship to HRQOL, such that black sexual minority women have worse or better HRQOL than expected.

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INTRODUCTION

It is well established that socially marginalized groups, such as, sexual minorities (non-heterosexual people) and black people in the U.S., generally experience worse health than dominant groups.^{1,2} Research focused on members of multiple marginalized groups, such as black sexual minority women (SMW), is growing, but many questions remain.

Among women, sexual minority status and black race are each associated with negative health behaviors and outcomes. For example, cardiovascular disease risk, fair or poor health, and poor mental health, are more common among SMW than heterosexual women.^{3–6} Compared with white women, black women have higher diabetes incidence, higher obesity prevalence, higher rates of HIV diagnosis, and worse self-rated health and health-related quality of life (HRQOL).^{2,7} Some explanations for these health inequities incorporate the psychosocial stress, discrimination, and limited access to health-promoting resources experienced by marginalized groups.^{8–11}

Intersectionality acknowledges that people occupy unique social spaces at the intersection of their particular combination of privileged and marginalized identities that cannot be accurately characterized by “adding up” the identities, or the corresponding social structures.¹² For example, Crenshaw^{13(p140)} articulates how the effects of multiple systems of oppression are not merely additive: “Because the intersectional experience is greater than the sum of racism and sexism, any analysis that does not take intersectionality into account cannot sufficiently address the particular manner in which black women are subordinated.” As intersectionality relates to public health, Bowleg¹⁴ describes how individual social identities and corresponding structural factors intersect to create health inequities. Thus, intersecting systems of oppression may influence the health of black SMW, and outcomes may be better than or worse than predicted based solely on an additive model.¹⁵ Intersectionality acknowledges this non-additivity, or qualitative concept of “multiplicativity” of social identities. Existing research documents quantitative statistical interactions between social groupings and their relationship to health, which have been analyzed on additive and multiplicative statistical scales, related to but distinct from the more conceptual meaning of multiplicative as it relates to intersectionality.^{12,15–17} Therefore, individual associations between race and health among women, and sexual orientation and health among women cannot necessarily be “summed” to predict the health of black SMW.

Research on the health of black SMW exists (e.g., smoking, reproductive health, and others), but gaps remain, including HRQOL.^{18–22} HRQOL is associated with behavioral risk factors and chronic illness and provides information about a population’s “burden of preventable disease, injuries, and disabilities.”^{23(p7)} Furthermore, research on the health of black SMW has not quantitatively characterized the relationship between the intersection of race and sexual orientation and health by comparing health among black SMW with health among white heterosexual women.^{18,19,21} In addition, few studies have used probability samples.¹⁹

The objectives of this study are twofold. First, this study used probability samples from 20 states to examine the relationship between HRQOL and race among black and white SWM,

and the relationship between HRQOL and sexual orientation identity (SOI) among black women. Second, this study examines whether there is evidence of interaction in the relationship between the intersection of race and SOI and HRQOL among black and white women, which provides quantitative support for the concept of intersectional multiplicativity. The authors expect that HRQOL among black SMW is worse than each of the comparison groups and that race and SOI interact in their relationship to HRQOL.

METHODS

Study Sample

The U.S.'s Behavioral Risk Factor Surveillance System (BRFSS) is a nationally representative phone survey of non-institutionalized English- or Spanish-speaking adults ages 18 years conducted annually by states and some territories, in partnership with the U.S. Centers for Disease Control and Prevention (CDC). The present study included the 20 states (Appendix) that asked participants' SOI in both 2014 and 2015, and made data publicly available by December 2016. BRFSS included 446,421 non-Hispanic black and white women in 2014 and 2015; a total of 183,867 of those women resided in the included states. The median survey response rate for all states, territories, and Washington, DC, in 2014 was 47.0% (range, 25.1%–60.1%); the median response rate for 2015 was 47.2% (range, 33.9%–61.1%).^{24,25} For 2014 and 2015 combined, the median response rate for states included in this study was 45.5% (range, 33.0%– 57.6%).

Analyses included participants with non-missing values for all predictor (race and SOI) and outcome variables; age group was available for all participants. Ninety percent ($n=166,256$) of black and white women in included states were asked to select their SOI. The present study excluded women who chose other or something else ($n=578$, 0.31%), don't know/not sure ($n=1,072$, 0.58%), or who refused to answer the question ($n=3,097$, 1.68%).²⁶ Of the 161,509 black and white women who reported a SOI of heterosexual, lesbian, or bisexual, 6,512 (4%) were excluded due to missing at least one of the HRQOL measures. This resulted in losing between 2.2% and 4.9% of each race and SOI combination. Excluded participants tended to be older and have lower educational attainment, and a higher proportion were widowed, were black, and had fair or poor health compared with included participants. Two white heterosexual women were also excluded because they were the only participants within their strata, for a total sample size of 154,995. This study does not constitute human subjects research, per the University of California, Berkeley Committee for Protection of Human Subjects.

Measures

The CDC optional module asks: *Do you consider yourself to be: 1 Straight, 2 Lesbian or gay, 3 Bisexual?* Some state-added questions explained the identity options by referencing sexual behavior and attraction (behavior and attraction were not collected), and presented the options in a different order. The study included non-Hispanic black and non-Hispanic white women.

HRQOL captures perceptions of physical or mental health, and CDC recommends the validated Healthy Days Measures, which are in the BRFSS core module.^{23,27} In addition to self-rated general health, a useful predictor of mortality and morbidity, the Healthy Days Measures capture the number of days in the past 30 days that participants' physical health was not good, mental health was not good, and poor physical or mental health limited their usual activities.²⁸

Per the CDC's recommendation, the number of days of poor physical health and poor mental health were summed.²³ Based on suggestions in CDC documentation, and for comparability with existing research, outcomes were dichotomized.^{23,29} Self-rated health was dichotomized as excellent, very good, or good versus fair or poor; days measures were dichotomized as both 14 days ("frequent") and 7 days.

Six age categories provided by the CDC were used: 18 to 24, 25 to 34, 35 to 44, 45 to 54, 55 to 64, and 65 years. Analyses did not adjust for other common control variables (e.g., educational attainment, marital status, income) or health behaviors (e.g., smoking) because they are likely mediators of the relationship between race and SOI and HRQOL.^{11,30,31}

Statistical Analysis

Data weighting in BRFSS accounts for the sampling design, noncoverage and nonresponse, and makes each state's data representative for that state. Analyses incorporated the BRFSS sample design stratification variable and raked weights using the survey package in Stata SE, version 14.2. Weighted proportions of each HRQOL measure and select demographics were estimated for each SOI and race combination. Crude and age-adjusted prevalence differences (PDs) comparing each HRQOL measure among black SMW with the HRQOL of: (1) black heterosexual women, (2) white SMW, and (3) white heterosexual women were estimated. These comparisons show differences in prevalence associated with: (1) SOI within black women, (2) black race within SMW, and (3) the intersection of SOI and race among black and white women; that is, having both marginalized social identities compared with having neither. Lesbian and bisexual women were analyzed separately.^{3,6,26,29} For outcomes in which age-adjusted PDs for lesbian and bisexual women were both non-zero, in the same direction, and not statistically different at $\alpha=0.05$, lesbian and bisexual women were also combined to increase sample size. No adjustments were made for multiple comparisons. In brief, Rothman^{32(p44)} argues that in most contexts, adjusting for multiple comparisons inaccurately presumes a "universal null hypothesis." CIs for each comparison are provided for the reader to critically examine.

Interaction on the additive scale is relevant to potential underlying causal interaction, and the presence of interaction on the additive scale is consistent with the concept of intersectional multiplicativity.¹² To assess additive interaction, the expected PD comparing black SMW with white heterosexual women was subtracted from the observed PD. The expected PD, assuming no additive interaction, was calculated by summing the PD associated with race among heterosexual women and the PD associated with SOI minority status among white women. In the absence of additive interaction, the observed PD was equal to the expected PD.

Age-adjusted PDs were estimated using g-computation, which standardizes each group's marginal prevalence to the age distribution of the corresponding sample.³³ For example, age-adjusted prevalences comparing black bisexual women and black heterosexual women were standardized to the combined age distribution of black bisexual women and black heterosexual women. For interaction analyses, age-adjusted prevalences were standardized to the combined age distribution of all heterosexual women and either all lesbians or all bisexual women. The underlying logistic regression allowed age to interact with SOI and race. Bootstrapping with 1,000 repetitions provided 95% CIs for age-adjusted PDs; both 95% CIs and 80% CIs were calculated for differences between expected and observed PDs.³⁴ Bootstrap sampling was stratified by the BRFSS sample design stratification variable. Analyses were conducted in 2017.

RESULTS

In general, black bisexual or lesbian women reported the worst HRQOL, at times matched or exceeded by white bisexual women (Table 1). White heterosexual women tended to report the best HRQOL. For example, black bisexual women reported fair or poor health more frequently than other women (29.2%); white lesbians and white heterosexual women least frequently reported fair or poor health (13% and 14%, respectively).

Age-adjusted PDs for most measures and comparisons showed worse HRQOL among black SMW; comparisons between black bisexual women and white bisexual women were an exception with mixed associations (Table 2 and Figure 1). Frequent days measures, which exhibit a similar pattern of results, are included in Appendix Table 2. Age-adjusted PDs tended to be larger (indicating worse health among black SMW) for measures dichotomized at 7 days than at 14 days. When analyzing bisexual and lesbian women separately, most 95% CIs included 0. When analyzing bisexual and lesbian women together, estimates were more precise.

PD point estimates varied by measure and by comparison group. Across comparisons, the largest PDs tended to be for fair or poor self-rated general health (e.g., age-adjusted PD=0.273, 95% CI=0.073, 0.472 comparing black lesbian women and white heterosexual women) and the smallest PDs tended to be for frequent poor physical health (e.g., age-adjusted PD=0.024, 95% CI= -0.091, 0.140 comparing black lesbian women and white heterosexual women; Appendix Table 2). Across measures, comparisons that included white heterosexual women, in particular black lesbians compared with white heterosexual women, tended to have the largest PDs; comparisons between black and white bisexual women tended to have the smallest PDs.

Many comparisons between black SMW and white heterosexual women suggested additive interaction between race and SOI. Age-adjusted PDs comparing black lesbian women and white heterosexual women were larger in magnitude than expected in the absence of additive interaction, with the exception of frequent unhealthy days (Table 3). Age-adjusted PDs comparing black bisexual women and white heterosexual women tended to be weaker than, or the same as, expected. All 95% CIs, and most 80% CIs, comparing observed and expected age-adjusted PDs included 0.

DISCUSSION

Consistent with the hypothesis, this study found that black SMW generally reported worse HRQOL than black heterosexual women, white SMW, and white heterosexual women. Comparisons between black and white bisexual women were a notable exception; the poor HRQOL of black bisexual women was sometimes matched or exceeded by the poor HRQOL of white bisexual women. The largest associations were found for comparisons between black SMW and white heterosexual women. To the authors' best knowledge, this is the first published research to compare these HRQOL measures between these groups using the same probability samples.

Some studies have investigated self-rated health among black SMW using different methods. In contrast to the present study, researchers found no difference in age-standardized prevalence of fair or poor self-rated health when comparing combined black lesbian (82%), bisexual (9%), and other sexual minority (9%) women with black heterosexual women from another survey.³⁵ However, this sample was limited to Los Angeles County, and the authors used a different standardization method.³⁵ Compared with the present study, Hsieh and Ruther¹⁵ found both similar and contrasting results in their investigation of race, SOI, and self-rated health. However, they used different methodology than the present study, including combining non-Hispanic black and Hispanic women.

Previous research on the mental health of black SMW used different methods than the present study, and reported partially consistent results. The present study found worse mental health-related HRQOL among combined black lesbian and bisexual women than among black heterosexual women, which is consistent with research on past indicators of psychological distress in two metropolitan nonprobability samples of black lesbian and heterosexual women.²² In the present study, black lesbians had worse mental health-related HRQOL than white lesbians, whereas black bisexual women had better mental health-related HRQOL than white bisexual women, although 95% CIs included 0 for all comparisons. These results are partially consistent with results from a New York City-based nonprobability sample, which analyzed lesbian and bisexual women together.³⁶

Consistent with the multiplicative intersectionality-informed hypothesis of non-additivity, the present study found that sexual orientation and race may interact in their relationship to HRQOL. Most PDs comparing black SWM with white heterosexual women implied interaction that led to either stronger or weaker associations than expected. However, all 95% CIs and most 80% CIs comparing observed and expected PDs included 0. Though not investigating the health of black SMW specifically, some results from Hsieh and Ruther¹⁵ supported a non-additive relationship between SOI and race and self-rated health, whereas other results did not. However, the study by Hsieh and Ruther¹⁵ controlled for additional demographic variables and investigated a different measure of self-rated health than the present study. The findings from the study by Veenstra¹⁶ are also consistent with the theory of intersectionality's application to health, though analyses did not test the intersection of SOI and race, specifically.

Although patterns of association magnitude differed for black lesbian and black bisexual women, the wide CIs suggest that further research with larger sample sizes would improve confidence that these patterns reflect real phenomena. The small number of black SMW in the present study and the underrepresentation of some U.S. regions, highlight the need for large national surveys that collect sexual orientation information, especially in geographic regions where more black women live. The contrast in the associations between race and HRQOL within lesbian women and within bisexual women may partially reflect the elevated prevalence of poor HRQOL among white bisexual women in this study sample. This is consistent with previous research that found worse HRQOL among bisexual women compared with lesbian women in a sample that was 80% non-Hispanic white.²⁹ In the present study, the racial disparity in college completion was larger between black and white lesbian women than between black and white bisexual women, which may contribute to the finding of stronger inequities in HRQOL between black and white lesbian women than between black and white bisexual women. Health-related behaviors, experiences of stigma and support, and other determinants of health may vary between lesbian and bisexual women and explain the different patterns of association between these SOI groups; future research will investigate health-related behavior among black SMW within the present sample.^{29,37}

Limitations

Twenty states were eligible for inclusion, therefore, results of the present study may not generalize to the U.S. as a whole. A small percentage of women were excluded due to missing outcome variables; results may have varied slightly if they had been included. The present study may not represent the HRQOL of SMW who self-identify using a term other than lesbian or bisexual (e.g., same gender loving or queer) and therefore selected other or something else, or women who have same-sex attractions or sexual interactions but do not identify as a sexual minority.²⁶ Furthermore, the concept of intersectionality encompasses all social identities and the present study included only two, SOI and race, among an already disadvantaged group—women—future work should address heterogeneity within black SMW. Finally, this study focused on black SMW, but the health of other SMW of color is also understudied. Nevertheless, the patterns in direction and magnitude of PDs suggest the importance of further investigation of the health of black SMW.

CONCLUSIONS

This study addresses an important knowledge gap by using a probability sample to investigate HRQOL and its relationship to race, SOI, and the intersection of race and SOI among black and white women using a quantitative interaction analysis that aligns with concepts of intersectional multiplicativity.¹² The present study identified a pattern of health inequities experienced by black SMW that, for the most part, aligns with theory and existing research. These patterns highlight the importance of further research about the health of black SMW, such as investigating specific health conditions and health-related behaviors, to inform prevention and intervention efforts. Some research using nonprobability samples has identified potential differences in health-related behaviors between black and white SMW.^{18,21} Future work should explore determinants of health and specific points of prevention or

intervention, including those in the clinical setting, that may be unique to or more nuanced among black SMW, and should include building from black SMW's strengths.^{36,38} In addition, longitudinal studies with diverse participants would add a life course perspective to the health of black SMW. Finally, to the degree that societal structures and power differentials contribute to the patterns of health inequities in the present study, multilevel interventions and social change are crucial to addressing these patterns.^{11,39}

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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EY worked on the study conception and design; obtaining, analyzing, and interpreting data; drafting and revising manuscript, and approved the final version. JA worked on the study design, data interpretation, critical revisions of manuscript, and approved the final version.

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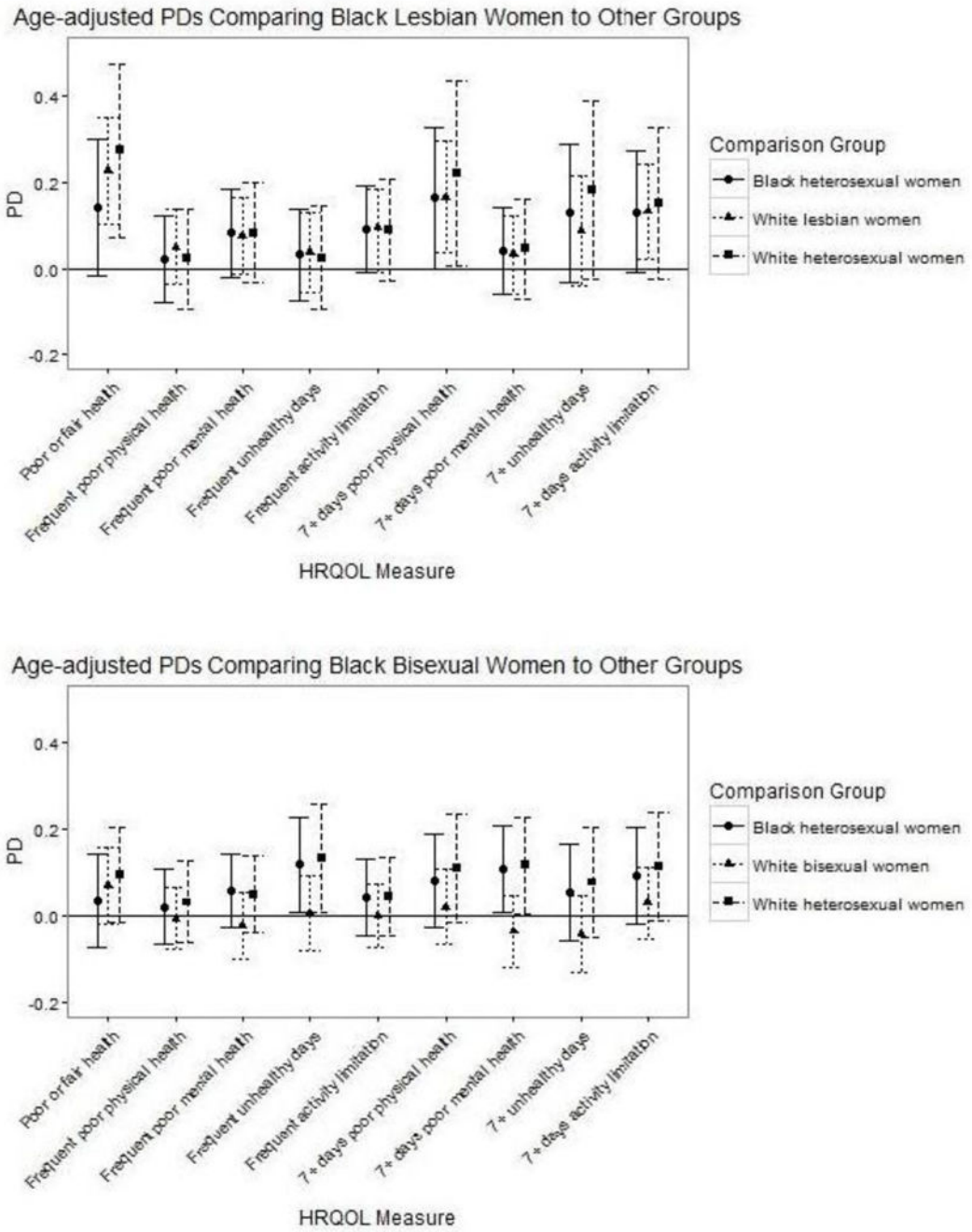


Figure 1. HRQOL among black sexual minority women – BRFSS, selected U.S. states, 2014 and 2015.

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Table 1.

Number and Weighted Proportions: Age and HRQOL – BRFSS, Selected U.S. States, 2014 and 2015

Variable	Black			White		
	Lesbian n=150 n (%)	Bisexual n=213 n (%)	Heterosexual n=12,464 n (%)	Lesbian n=1,598 n (%)	Bisexual n=1,969 n (%)	Heterosexual n=138,601 n (%)
Age, years						
18–24	18 (29.4)	50 (39.7)	639 (13.1)	110 (18.8)	358 (34.9)	4,194 (9.1)
25–34	39 (29.3)	60 (32.7)	1,309 (17.0)	133 (15.0)	437 (30.4)	9,352 (12.8)
35–44	26 (11.3)	39 (14.8)	1,737 (18.1)	182 (16.6)	316 (14.0)	14,387 (14.5)
45–54	33 (17.8)	23 (5.0)	2,419 (18.4)	383 (22.4)	272 (8.9)	22,937 (19.0)
55–64	23 (8.4)	20 (3.1)	3,040 (17.3)	467 (17.1)	278 (6.1)	33,818 (19.4)
>65	11 (3.7)	21 (4.7)	3,320 (16.2)	323 (10.1)	308 (5.8)	53,913 (25.3)
HRQOL measures						
Fair or poor self-rated health	36 (22.9)	59 (29.2)	2,901 (20.7)	243 (13.0)	397 (21.1)	20,365 (14)
Frequent poor physical health	23 (16.6)	35 (21.1)	1,781 (12.1)	233 (11.6)	348 (18.0)	17,845 (12.4)
Frequent poor mental health	30 (21.3)	51 (27.8)	1,497 (13.7)	234 (17.6)	475 (28.4)	14,230 (12.2)
Frequent unhealthy days	39 (28.3)	75 (41.5)	2,776 (22.2)	402 (26.1)	679 (40.3)	27,563 (21.1)
Frequent activity limitation	25 (19.7)	22 (14.7)	1,223 (9.0)	185 (11.1)	264 (15.1)	11,328 (8.2)
7+ days poor physical health	34 (31.9)	51 (28.9)	2,512 (18.2)	317 (17.3)	478 (26.3)	24,464 (17.3)
7+ days poor mental health	39 (27.3)	73 (36.5)	2,183 (19.9)	330 (24.9)	677 (42.1)	20,716 (17.7)
7+ unhealthy days	52 (45.0)	97 (51.5)	3,903 (31.9)	559 (38.0)	918 (53.1)	38,390 (29.9)
7+ days activity limitation	32 (24.2)	38 (20.9)	1,685 (13.0)	257 (15.1)	382 (20.7)	15,685 (11.5)

BRFSS, Behavioral Risk Factor Surveillance System; HRQOL, health-related quality of life

Table 2.

Select Age-adjusted HRQOL Prevalence Differences – BRFSS, Selected U.S. States, 2014 and 2015

HRQOL measure	PD (95% CI)	PD (95% CI)	PD (95% CI)
Black lesbian women compared to	Black heterosexual	White lesbian	White heterosexual
Fair or poor self-rated health	0.142 (−0.016, 0.299)	0.227 (0.104, 0.351)	0.273 (0.073, 0.472)
7+ days poor physical health	0.165 (0.001, 0.328)	0.166 (0.038, 0.294)	0.220 (0.008, 0.432)
7+ days poor mental health	0.042 (−0.059, 0.142)	0.034 (−0.056, 0.124)	0.047 (−0.068, 0.163)
7+ unhealthy days	0.129 (−0.030, 0.288)	0.088 (−0.040, 0.215)	0.183 (−0.023, 0.389)
7+ days activity limitation	0.132 (−0.008, 0.271)	0.133 (0.024, 0.241)	0.152 (−0.022, 0.326)
Black bisexual women compared to	Black heterosexual	White bisexual	White heterosexual
Fair or poor self-rated health	0.035 (−0.071, 0.142)	0.070 (−0.017, 0.157)	0.095 (−0.014, 0.204)
7+ days poor physical health	0.081 (−0.028, 0.190)	0.020 (−0.065, 0.106)	0.11 (−0.015, 0.234)
7+ days poor mental health	0.107 (0.008, 0.206)	−0.036 (−0.120, 0.047)	0.116 (0.006, 0.227)
7+ unhealthy days	0.054 (−0.059, 0.167)	−0.041 (−0.129, 0.047)	0.077 (−0.050, 0.203)
7+ days activity limitation	0.092 (−0.020, 0.203)	0.030 (−0.053, 0.113)	0.113 (−0.013, 0.239)
Black sexual minority women (combined lesbian and bisexual; SMW) compared to	Black heterosexual	White SMW	White heterosexual
Fair or poor self-rated health	0.067 (−0.022, 0.155)	0.122 (0.046, 0.198)	0.145 (0.035, 0.255)
7+ days poor physical health	0.101 (0.009, 0.193)	0.078 (0.000, 0.155)	0.134 (0.018, 0.251)
7+ days poor mental health	0.085 (0.008, 0.162)	N/A ^a	0.091 (0.008, 0.173)
7+ unhealthy days	0.080 (−0.013, 0.172)	N/A ^a	0.107 (−0.011, 0.224)
7+ days activity limitation	0.118 (0.036, 0.201)	0.079 (0.012, 0.145)	0.136 (0.041, 0.231)

^aEstimates for lesbian and bisexual women were in different directions. Boldface indicates statistical significance ($p < 0.05$). Age-adjusted using age categories: 18–24, 25–34, 35–44, 45–54, 55–64, >65 years.

BRFSS, Behavioral Risk Factor Surveillance System; HRQOL, health-related quality of life; PD, prevalence difference

Table 3.

Age-adjusted Excess HRQOL Prevalence^a Due to Interaction - BRFSS, Selected U.S. States, 2014 and 2015

HRQOL measure	Expected PD ^a	Black lesbian women			Expected PD ^a	Black bisexual women		
		Excess prevalence ^a due to interaction				Excess prevalence ^a due to interaction		
		Excess	95% CI	80% CI		Excess	95% CI	80% CI
Fair or poor self-rated health	0.073	0.199	-0.004, 0.402	0.067, 0.331	0.172	-0.077	-0.192, 0.038	-0.152, -0.002
Frequent poor physical health	0.014	0.011	-0.109, 0.130	-0.067, 0.089	0.072	-0.041	-0.140, 0.058	-0.106, 0.024
Frequent poor mental health	0.017	0.067	-0.049, 0.183	-0.009, 0.143	0.093	-0.043	-0.135, 0.049	-0.103, 0.017
Frequent unhealthy days	0.036	-0.008	-0.129, 0.113	-0.087, 0.071	0.129	0.004	-0.129, 0.138	-0.083, 0.091
Frequent activity limitation	0.029	0.061	-0.059, 0.180	-0.017, 0.139	0.06	-0.016	-0.109, 0.078	-0.077, 0.045
7+ days poor physical health	0.040	0.18	-0.036, 0.396	0.039, 0.321	0.095	0.015	-0.117, 0.147	-0.071, 0.101
7+ days poor mental health	0.035	0.013	-0.104, 0.130	-0.063, 0.089	0.115	0.002	-0.113, 0.116	-0.072, 0.076
7+ unhealthy days	0.080	0.103	-0.108, 0.313	-0.034, 0.240	0.135	-0.058	-0.192, 0.076	-0.146, 0.030
7+ days activity limitation	0.040	0.112	-0.064, 0.288	-0.003, 0.227	0.070	0.043	-0.086, 0.172	-0.041, 0.127

^aCompared to white heterosexual women. Boldface indicates statistical significance ($p < 0.20$, customary for interaction analyses, see Jewell [2004]). Age-adjusted using age categories: 18–24, 25–34, 35–44, 45–54, 55–64, >65 years.

BRFSS, Behavioral Risk Factor Surveillance System; HRQOL, Health-related quality of life; PD, prevalence difference

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