

Association of Enacted Stigma with Depressive Symptoms Among Gay and Bisexual Men Who Have Sex with Men: Baltimore, 2011 and 2014

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Abstract

Purpose: We assessed differences between gay and bisexual men in enacted stigma, and how the association between stigma and depressive symptoms may vary according to sexual orientation identity.

Methods: Participants (671 gay and 331 bisexual men who have sex with men) in Baltimore's 2011 and 2014 National HIV Behavioral Surveillance completed an anonymous survey, including 3 enacted stigma dimensions and the Center for Epidemiologic Studies Depression Scale. Adjusted prevalence ratios were calculated through Generalized Estimating Equation models adjusting for theorized confounders (demographic, socioeconomic, and relational factors).

Results: Bisexual men reported stigma experiences less frequently than did gay men (verbal harassment 22.7% vs. 32.3%, and discrimination 15.7% vs. 23.0%). Relevant depressive symptoms were reported by 43.1% of bisexual men and 34.2% of gay men ($p < 0.001$). Statistically significant differences in depressive symptoms between bisexual and gay men disappeared after adjusting for socioeconomic factors. The three enacted stigma dimensions were significantly associated with depressive symptoms, but their interaction with sexual orientation identity was not.

Conclusion: This study confirms the association between enacted stigma and depressive symptoms among gay and bisexual men. However, sexual orientation identity did not modify this association as hypothesized. The bisexual men presented other psychosocial stressors that may explain their higher prevalence of depressive symptoms. The high levels of verbal harassment, discrimination, and physical assault reported by gay and bisexual men and their negative effect on mental health indicate the need to develop new effective public health strategies to avoid these consequences of homophobic and biphobic culture.

Keywords: bisexual men, discrimination, gay men, mental health, stigma

Introduction

DESPITE MAJOR CHANGES over the past two decades, gay and bisexual men remain stigmatized in many countries worldwide due to their sexual orientation.^{1,2} Stigma has been defined as the social discrediting of a marginalized individual or group by others due to perceived negative attributes.³ Stigma is a complex and broad concept, which may include perceived, internalized, and enacted stigma.⁴⁻⁶

Compared to bisexual individuals, gay men report higher rates of enacted stigma (verbal harassment, discrimination, and physical violence),^{7,8} which has been attributed to their greater visibility.⁹ On the other hand, bisexual individuals may experience pressure to conform to a binary sexual orientation,¹⁰ and prejudice due to specific stereotypes associated with bisexuality such as confusion, promiscuity,^{11,12} or being a “bridge” population for HIV.¹³ Bisexual men may also confront prejudicial behaviors and attitudes within the LGBT community.¹⁴⁻¹⁷

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Both gay and bisexual men are at increased risk for adverse mental health outcomes in comparison to their heterosexual counterparts, but bisexual men have been found to present higher rates of adverse outcomes than gay men.¹⁰ These mental health disparities have been attributed to numerous factors, such as stigma^{10,18} and socioeconomic position^{19–21} as well as their interrelation.^{7,10} Several studies have evaluated the association between mental health and sexual orientation-related stigma,^{16,22–29} but without evaluating if this association differs between gay and bisexual men.

Are mental health disparities between gay and bisexual men explained mostly by differences in demographic, socioeconomic, and relational factors? Or is enacted stigma related to depression differently for gay versus bisexual men? For example, experiencing frequent enacted stigma could facilitate the development of tools, strategies, or mechanisms to cope with their negative effects on mental health among gay men. In contrast, among bisexual men, the differential stress of not disclosing their sexual orientation and internalizing negative attitudes toward effeminacy could modify the effect of enacted stigma on their mental health.³⁰

The aim of our study was to assess differences between gay and bisexual men in enacted stigma, and how the association between stigma and depressive symptoms may vary according to sexual orientation identity, using data collected in Baltimore in 2011 and 2014. Our general hypothesis was that sexual orientation identity can affect stigma experiences and modify their effect on depressive symptoms, producing different patterns for gay and bisexual men.^{7,22–24} Following the structural framework proposed by Mulé et al.³¹ and the minority stress model,¹⁸ our specific hypotheses were as follows: (1) we expect higher prevalence of depressive symptoms in men reporting more enacted stigma experiences; (2) race/ethnicity⁷ may modify the association of stigma with mental health; (3) stigma and other minority stressors^{18,27,32} are situated within general environmental circumstances; as bisexual men may have a lower socioeconomic status compared with gay men,^{19–21} this can confound the association between stigma and depressive symptoms³³; and (4) being open about one's sexual orientation and being in a relationship can have negative consequences for bisexual people^{34,35} in ways that differ from gay or heterosexual men, thus modifying the impact of stigma on depressive symptoms.

Methods

Sampling and recruitment

The National HIV Behavioral Surveillance (NHBS) is conducted in rotating annual cycles to monitor HIV prevalence and sociobehavioral characteristics among men who have sex with men (MSM), injection drug users, and those with a heightened risk through heterosexual sex, in ~20 cities in the United States.^{36,37} NHBS procedures have been published previously.^{38,39}

For this study, we focused on the MSM sample recruited in the Baltimore metropolitan area in 2011 and 2014. The study was approved by the Johns Hopkins Bloomberg School of Public Health Institutional Review Board (IRB) and the Maryland Department of Health IRB (H.34.03.07.02.A1). MSM were recruited using venue-based, time-space sam-

pling methods described elsewhere.³⁶ Eligible participants were males 18 years of age or older who were residents of the Baltimore metropolitan region, reported oral or anal sex with another man in the past 12 months, and were able to complete the survey in English or Spanish.³⁸ After completing the informed consent procedures, eligible participants responded to a structured computerized interview administered anonymously by trained interviewers.

Measures

Health determinants. Sociodemographic characteristics included age, race/ethnicity, education level, employment status, household annual income, homelessness (past 12 months), and marital status. Race/ethnicity was classified according to the racial group or groups with which the men identified, and a further question for those with Hispanic or Latin-American origin. Household annual income before taxes was dichotomized applying the cutoff point of \$20,000 (average poverty threshold for a family of three in 2014, as defined by the United States Census Bureau)⁴⁰ to be consistent with previous research.^{7,41}

Sexual orientation-related variables. Respondents were asked to identify which category best described them (heterosexual or “straight,” homosexual or gay, and bisexual) and a question on sexual orientation disclosure regarding same-sex attraction: “have you told anyone that you are attracted to or have sex with men?” (Yes/No).

Enacted stigma. The enacted stigma scale included in NHBS was adapted from previously published surveys,^{42–45} and assessed discrimination based on perceived same-sex attraction. Specifically, men were asked if they had experienced any situation (out of a list of five) as a result of someone knowing or assuming they were attracted to men. These five items covered three enacted stigma dimensions⁴⁵: verbal harassment (being called names or insulted), discrimination (receiving poorer services in restaurants, stores, or other businesses; been treated unfairly at work or school; and been denied or given lower quality health care), and physical assault (physically attacked or injured).

Depressive symptoms. Depressive symptoms were measured with the 10-question version of the Center for Epidemiologic Studies Depression (CES-D-10) Scale,⁴⁶ which was included only in the Baltimore local survey. The revised CES-D-10 measured with a four-point scale the frequency with which each mood or symptom had occurred “during the past week”⁴⁶; scores range from 0 to 30, and a cutoff point of 10 or higher indicates the presence of clinically relevant depressive symptoms.

Statistical analysis

The statistical power, calculated retrospectively for the bisexual group due to its smaller sample size ($n = 331$), allowed the detection of prevalence ratios of 1.5 on relevant depressive symptoms between men who had experienced enacted stigma and those who had not, with alpha risk of 0.05 and beta of 0.1. The χ^2 was used to test differences between gay, bisexual, and heterosexual groups, between waves, between participants who did or did not complete the CES-D-10

Scale, and between individuals who did or did not report depressive symptoms.

To evaluate differential item functioning (DIF)⁴⁷ of the enacted stigma scale by sexual orientation identity, three nested models were constructed with logistic regression for each item (dependent variable): Model 1 only included the total stigma score (number of experiences endorsed); Model 2 added sexual orientation identity; and Model 3 also included the interaction between the total stigma score and sexual orientation identity. McFadden's pseudo $R^2 > 0.02$ between Model 1 and Model 2 and between Model 2 and Model 3 indicate, respectively, uniform and nonuniform DIF.

We built Generalized Estimating Equation (GEE) models using a Poisson distribution to assess differences by sexual orientation identity, first in stigma and second in depressive symptoms. In both cases, to examine the hypothesis, four nested models were constructed: adjusting for study wave and age (Model 1); then adding race/ethnicity (Model 2); introducing education level, household annual income, employment status, and homelessness as socioeconomic factors (Model 3); and finally adding sexual orientation disclosure and marital status as relational factors (Model 4). These nested models were compared using the quasi-likelihood under the Independence model Criterion.⁴⁸ GEE models were constructed to account for clustering⁴⁹ by venue and date. Poisson regression distribution was selected to estimate the prevalence ratio,⁵⁰ which is easier to interpret and communicate in cross-sectional studies than an odds ratio.

To assess differences in enacted stigma between gay and bisexual men, models were constructed for any experience of enacted stigma, and also for each specific dimension of enacted stigma (dependent variable). To study the relationship between stigma and relevant depressive symptoms (dependent variable), the models tested interactions between sexual orientation identity and stigma, among stigma dimensions, and of stigma with race/ethnicity, sexual orientation disclosure, and marital status. Analyses were conducted using STATA 12.0 (StataCorp. 2011; StataCorp LP, College Station, TX) and SAS 9.4 (SAS Institute Inc., Cary, NC).

Results

Sample characteristics

Most of the participants identified as gay ($n=671$), followed by bisexual ($n=331$) and heterosexual men ($n=57$). Table 1 shows that gay men were significantly younger, more frequently living with a partner, employed, with a higher level of education and household annual income, less frequently homeless, and had a lower prevalence of relevant depressive symptoms (34.2% vs. 43.1% and 59.3%; $p < 0.001$) than bisexual and heterosexual men. As the sexual orientation-related stigma scale was not administered to the heterosexual participants, this group was excluded from the analysis. Compared with bisexual men, gay men reported more frequently being non-Hispanic White, having disclosed their sexual orientation, and having experienced verbal harassment (32.3% vs. 22.7%; $p=0.002$) and discrimination (23.0% vs. 15.7%; $p=0.008$).

There were significant differences in age, race/ethnicity, education level, household annual income, and employment

status between men in the 2011 and 2014 waves. The comparison between participants who did and those who did not complete the CES-D-10 scale (Supplementary Table S1) only showed differences in age ($p=0.017$) and household annual income ($p=0.009$). No DIF between gay and bisexual men was observed for any of the enacted stigma questions (Table 2).

Depressive symptoms by enacted stigma

Figure 1 shows that the prevalence of depressive symptoms was statistically higher among gay men who reported experiencing enacted stigma than among gay men who did not: verbal harassment (43.78% vs. 29.77%, $p=0.001$), discrimination (46.21% vs. 30.60%, $p=0.001$), and physical assault (51.67% vs. 32.34%, $p=0.003$). However, among bisexual men, statistically significant differences were only detected in discrimination ($p=0.031$).

Enacted stigma by sexual orientation identity and socioeconomic factors

Table 3 shows nested models examining which characteristics were independently associated with reporting any enacted stigma experience. Prevalence of enacted stigma experience was statistically lower among bisexual men, the oldest group (≥ 40 years), and non-Hispanic Black men. Participants who were unable to work for health reasons and those who reported past 12-month homelessness presented statistically higher prevalence of enacted stigma experiences. Supplementary Table S2 shows models constructed separately for each dimension.

Association of depressive symptoms with enacted stigma

Table 4 shows adjusted prevalence ratios (aPR) for depressive symptoms. As the interactions between sexual orientation identity and enacted stigma were not statistically significant, they were not included in the final model: aPR of the interaction with verbal harassment was 0.80 (95% confidence interval [CI] 0.54–1.16), with discrimination it was 1.06 (95% CI 0.71–1.58), and with physical assault it was 0.86 (95% CI 0.44–1.68). Statistically significant higher prevalence of depressive symptoms in bisexual men compared with gay men (reference category) in Models 1 and 2 disappeared after adding socioeconomic factors in Model 3 (aPR 1.10, 95% CI 0.91–1.32) and relational factors in Model 4 (aPR 1.06, 95% CI 0.87–1.30). The three enacted stigma dimensions, as well as the interactions between the dimensions, were significantly associated with depressive symptoms. Significantly higher aPR were seen for nonemployed men (1.30 for those who were unemployed or retired and 1.78 for those unable to work for health reasons) as well as for full-time students (1.51) and those who indicated "other" for employment status (1.60), also for men who were neither married nor cohabiting (1.35). No statistically significant interactions were found between the three dimensions of enacted stigma and race/ethnicity ($p=0.42$, 0.46, and 0.08), sexual orientation disclosure ($p=0.19$, 0.83, and 0.68), or marital status ($p=0.77$, 0.27, and 0.61).

TABLE 1. HEALTH DETERMINANTS, DEPRESSIVE SYMPTOMS, AND SEXUAL MINORITY-RELATED ENACTED STIGMA IN MEN WHO HAVE SEX WITH MEN BY STUDY WAVE AND SEXUAL ORIENTATION IDENTITY IN THE BALTIMORE-TOWSON-COLUMBIA METROPOLITAN STATISTICAL AREA, 2011 AND 2014

	Gay (n = 671), n (%)	Bisexual (n = 331), n (%)	Heterosexual (n = 57), n (%)	p*	Gay and bisexual MSM (n = 1002), n (%)	2011 (n = 468), n (%)	2014 (n = 534), n (%)	p
Health determinants								
Sexual orientation identity								
Gay								
Bisexual								
Age groups								
18–24	202 (30.1)	70 (21.1)	8 (14.0)		671 (67.0)	306 (65.4)	365 (68.4)	0.319
25–39	283 (42.2)	113 (34.1)	21 (36.8)		331 (33.0)	162 (34.6)	169 (31.6)	
≥40	186 (27.7)	148 (44.7)	28 (49.1)	<0.001 ^{a,b}				
Race/ethnicity								
Non-Hispanic White	151 (22.6)	35 (10.6)	12 (21.1)		186 (18.6)	65 (13.9)	121 (22.7)	<0.001
Non-Hispanic Black	442 (66.3)	264 (79.8)	40 (70.2)		706 (70.7)	360 (77.1)	346 (65.2)	
Hispanic	25 (3.7)	7 (2.1)	2 (3.5)		32 (3.2)	11 (2.4)	21 (3.9)	
Multiracial	37 (5.5)	20 (6.0)	2 (3.5)		57 (5.7)	26 (5.6)	31 (5.8)	
Other	12 (1.8)	5 (1.5)	1 (1.8)		17 (1.7)	5 (1.1)	12 (2.3)	
Missing	4 (0.1)	0 (0.0)	0 (0.0)		4 (0.4)	1 (0.2)	3 (0.6)	
Education level								
Grades 1–8	5 (0.7)	6 (1.8)	2 (3.5)		11 (1.1)	5 (1.1)	6 (1.1)	<0.001
Grades 9–11	28 (4.2)	62 (18.7)	14 (24.6)		90 (9.0)	58 (12.4)	32 (6.0)	
Grade 12 or GED	228 (34.0)	138 (41.7)	22 (38.6)		366 (36.5)	195 (41.7)	171 (32.0)	
College, Associate's or Technical degree	213 (31.7)	86 (26.0)	13 (22.8)		299 (29.8)	144 (30.8)	155 (29.0)	
Bachelor's degree	127 (18.9)	30 (9.1)	4 (7.0)		157 (15.7)	45 (9.6)	112 (21.0)	
Any postgraduate studies	70 (10.4)	9 (2.7)	2 (3.5)	<0.001 ^{a,b}	79 (7.9)	21 (4.5)	58 (10.9)	
Household annual income								
\$0 to \$19,999	264 (41.6)	202 (63.3)	39 (73.6)		466 (48.9)	243 (54.4)	223 (44.1)	0.002
≥ \$20,000	370 (58.4)	117 (36.7)	14 (26.4)	<0.001 ^{a,b}	487 (51.1)	204 (45.6)	283 (55.9)	
Missing	37 (5.5)	12 (3.6)	4 (7.0)		49 (4.9)	21 (4.5)	28 (5.2)	
Employment status								
Employed	423 (63.0)	154 (46.5)	27 (47.4)		577 (57.6)	243 (51.9)	334 (62.5)	0.001
Full-time student	51 (7.6)	15 (4.5)	0 (0.0)		66 (6.6)	28 (6.0)	38 (7.1)	
Unemployed or retired	139 (20.7)	121 (36.6)	22 (38.6)		260 (25.9)	149 (31.8)	111 (20.8)	
Unable to work for health reasons	33 (4.9)	25 (7.6)	6 (10.5)		58 (5.8)	23 (4.9)	35 (6.6)	
Other	25 (3.7)	16 (4.8)	2 (3.5)		41 (4.1)	25 (5.3)	16 (3.0)	
Homelessness in the past 12 months								
No	620 (92.4)	243 (73.9)	39 (68.4)		863 (86.3)	392 (84.1)	471 (88.2)	0.061
Yes	51 (7.6)	86 (26.1)	18 (31.6)	<0.001 ^{a,b}	137 (13.7)	74 (15.9)	63 (11.8)	
Missing	0 (0.0)	2 (0.6)	0 (0.0)		2 (0.2)	2 (0.4)	0 (0.0)	

(continued)

TABLE 1. (CONTINUED)

	Gay (n = 671), n (%)	Bisexual (n = 331), n (%)	Heterosexual (n = 57), n (%)	p*	Gay and bisexual MSM (n = 1002), n (%)	2011 (n = 468), n (%)	2014 (n = 534), n (%)	p
Marital status								
Married or cohabiting with a man	206 (32.3)	38 (11.8)	0 (0.0)	<0.001^{a,b,c}	244 (25.4)	109 (23.9)	135 (26.8)	0.412
Married or cohabiting with a woman	0 (0.0)	40 (12.4)	15 (27.8)		40 (4.2)	22 (4.8)	18 (3.6)	
Not married or cohabiting	432 (67.7)	244 (75.8)	39 (72.2)		676 (70.4)	325 (71.3)	351 (69.6)	
Missing	33 (4.9)	9 (2.7)	3 (5.3)		42 (4.2)	12 (2.6)	30 (5.6)	
Sexual orientation disclosure								
No	28 (4.2)	109 (32.9)	—	<0.001	137 (13.7)	71 (15.2)	66 (12.4)	0.196
Yes	643 (95.8)	222 (67.1)	—		865 (86.3)	397 (84.8)	468 (87.6)	
Missing	0 (0.0)	0 (0.0)	57 (100.0)		0 (0.0)	0 (0.0)	0 (0.0)	
Depressive symptoms (score ≥10)								
No	416 (65.8)	181 (56.9)	22 (40.7)	<0.001^{a,b,c}	597 (62.8)	276 (61.7)	321 (63.8)	0.509
Yes	216 (34.2)	137 (43.1)	32 (59.3)		353 (37.2)	171 (38.3)	182 (36.2)	
Missing	39 (5.8)	13 (3.9)	3 (5.3)		52 (5.2)	21 (4.5)	31 (5.8)	
Verbal harassment								
No	453 (67.7)	256 (77.3)	—	0.002	709 (70.9)	332 (71.1)	377 (70.7)	0.900
Yes	216 (32.3)	75 (22.7)	—		291 (29.1)	135 (28.9)	156 (29.3)	
Missing	2 (0.3)	0 (0.0)	57 (100.0)		2 (0.2)	1 (0.2)	1 (0.2)	
Service discrimination								
No	580 (86.4)	296 (89.4)	—	0.180	876 (87.4)	404 (86.3)	472 (88.4)	0.325
Yes	91 (13.6)	35 (10.6)	—		126 (12.6)	64 (13.7)	62 (11.6)	
Missing	0 (0.0)	0 (0.0)	57 (100.0)		0 (0.0)	0 (0.0)	0 (0.0)	
Work/school discrimination								
No	579 (86.4)	303 (92.1)	—	0.009	882 (88.3)	406 (86.9)	476 (89.5)	0.214
Yes	91 (13.6)	26 (7.9)	—		117 (11.7)	61 (13.1)	56 (10.5)	
Missing	1 (0.1)	2 (0.6)	57 (100.0)		3 (0.3)	1 (0.2)	2 (0.4)	
Health care discrimination								
No	657 (97.9)	320 (97.0)	—	0.359	977 (97.6)	456 (97.4)	521 (97.7)	0.747
Yes	14 (2.1)	10 (3.0)	—		24 (2.4)	12 (2.6)	12 (2.3)	
Missing	0 (0.0)	1 (0.3)	57 (100.0)		1 (0.1)	0 (0.0)	1 (0.2)	
Any discrimination								
No	517 (77.0)	279 (84.3)	—	0.008	796 (79.4)	364 (77.8)	432 (80.9)	0.223
Yes	154 (23.0)	52 (15.7)	—		206 (20.6)	104 (22.2)	102 (19.1)	
Missing	0 (0.0)	0 (0.0)	57 (100.0)		0 (0.0)	0 (0.0)	0 (0.0)	
Physical assault								
No	610 (90.9)	312 (94.3)	—	0.066	922 (92.0)	424 (90.6)	498 (93.3)	0.121
Yes	61 (9.1)	19 (5.7)	—		80 (8.0)	44 (9.4)	36 (6.7)	
Missing	0 (0.0)	0 (0.0)	57 (100.0)		0 (0.0)	0 (0.0)	0 (0.0)	

Bold denotes significance at a level of $p < 0.05$.*Statistically significant differences ($p < 0.05$) between sexual orientation identity groups are specified in superscript letters: ^aGay versus bisexual; ^bgay versus heterosexual; ^cbisexual versus heterosexual.

GED, General Educational Development; MSM, men who have sex with men.

TABLE 2. DIFFERENTIAL ITEM FUNCTIONING OF THE ENACTED STIGMA SCALE BY SEXUAL ORIENTATION IDENTITY

Item	<i>Pseudo R² change</i>			
	<i>Uniform DIF</i>	<i>Nonuniform DIF</i>	<i>Overall DIF</i>	<i>Relative β change</i>
“You were called names or insulted”	<0.01	0.004	0.004	0.003
“You received poorer services than other people in restaurants, stores, other businesses or agencies”	0.001	0.003	0.004	0.003
“You were treated unfairly at work or school”	0.003	<0.01	0.003	<0.001
“You were denied or given lower quality health care”	0.017	<0.01	0.017	0.029
“You were physically attacked or injured”	0.002	<0.01	0.002	<0.001

Pseudo R^2 and relative change of coefficient statistics for DIF analyses by sexual orientation identity (gay vs. bisexual men). DIF, differential item functioning.

Discussion

Bisexual men reported enacted stigma experiences less frequently than did gay men even after adjustment. In contrast, our results indicated that socioeconomic and relational factors explain differences between gay and bisexual men in prevalence of depressive symptoms. As expected, men who reported enacted stigma experiences presented higher prevalence of clinically relevant depressive symptoms than those who did not, but the effect of these experiences was not cumulative. Against our a priori hypothesis, sexual orientation identity did not modify the association of enacted stigma with depressive symptoms, neither did race/ethnicity, sexual orientation disclosure, or being in a relationship.

Prevalence of enacted stigma experiences and depressive symptoms

The large proportion of men reporting enacted stigma related to their sexual minority status in the Baltimore NHBS sample analyzed in this article was very similar to U.S. na-

tional estimates obtained in 20 cities in 2011⁴¹: one-third reported verbal harassment, one quarter reported discrimination, and 8% reported physical assault as a result of perceived same-sex attraction.⁴¹ The NHBS national report did not provide information on enacted stigma separately for gay and bisexual men, but other studies have found a higher enacted stigma prevalence among gay men compared with bisexual men,^{7,9,29} as in our study. We found that these differences were not attenuated after adjusting for demographic variables, and socioeconomic and relational factors.

It is worth highlighting that more than one-third of the men in our sample had clinically relevant depressive symptoms, 59.3% among heterosexual MSM, 43.1% among bisexual respondents, and 34.2% among gay men. This result is consistent with a Californian study showing that 25.1% of homosexually experienced heterosexual men, 14.6% of bisexual men, and 11.9% of gay men reported high levels of psychological distress in the last 30 days.⁵¹ Furthermore, it adds weight to hypotheses of added social strain among heterosexual and bisexual MSM.⁵¹

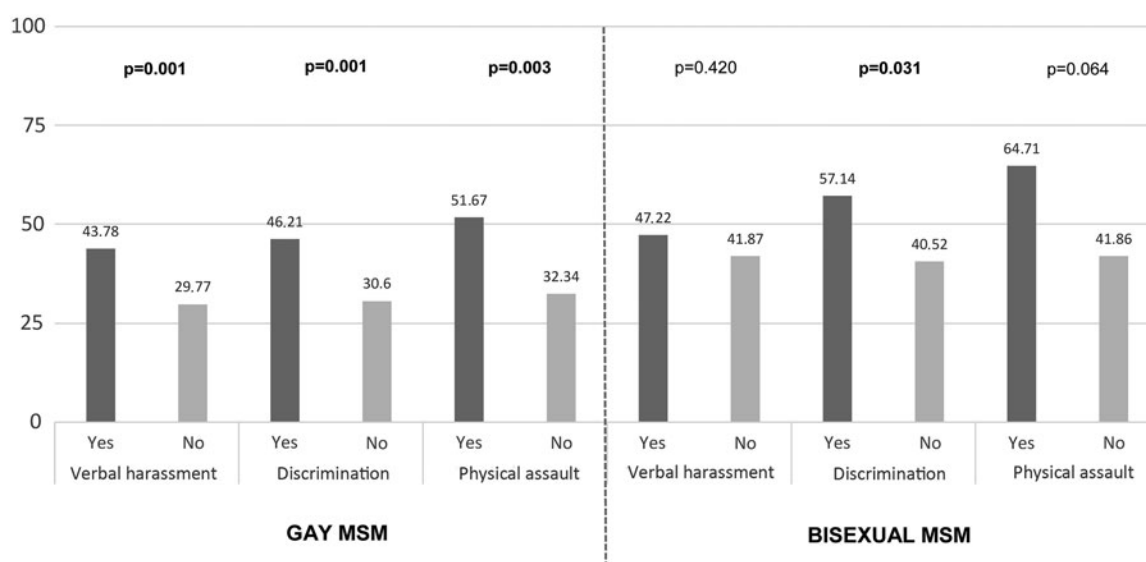


FIG. 1. Percentages of participants presenting relevant depressive symptoms among those who reported (darkest gray) or not (lighter gray) sexual minority-related enacted stigma, separately for gay and bisexual men in Baltimore, 2011 and 2014. Bold denotes significance at the level of $p < 0.05$.

TABLE 3. GENERALIZED ESTIMATING EQUATION MODELS USING A POISSON DISTRIBUTION TO ASSESS THE ASSOCIATION OF SEXUAL ORIENTATION IDENTITY AND OTHER CHARACTERISTICS WITH ANY ENACTED STIGMA EXPERIENCE (DEPENDENT VARIABLE) AMONG GAY AND BISEXUAL MEN IN THE BALTIMORE-TOWSON-COLUMBIA METROPOLITAN STATISTICAL AREA, 2011 AND 2014

	Model 1		Model 2		Model 3		Model 4	
	Estimate, <i>aPR</i> (95% CI)	p	Estimate, <i>aPR</i> (95% CI)	p	Estimate, <i>aPR</i> (95% CI)	p	Estimate, <i>aPR</i> (95% CI)	p
Intercept	0.49 (0.43–0.57)	< 0.001	0.57 (0.46–0.71)	< 0.001	0.61 (0.42–0.89)	0.010	0.60 (0.40–0.88)	0.010
Sexual orientation identity								
Gay	Ref.		Ref.		Ref.		Ref.	
Bisexual	0.75 (0.61–0.92)	0.005	0.77 (0.63–0.95)	0.012	0.69 (0.56–0.85)	0.001	0.74 (0.58–0.93)	0.011
Wave								
2011	Ref.		Ref.		Ref.		Ref.	
2014	0.94 (0.80–1.10)	0.447	0.92 (0.78–1.08)	0.283	0.93 (0.78–1.09)	0.365	0.94 (0.79–1.11)	0.449
Age groups, years								
18–24	Ref.		Ref.		Ref.		Ref.	
25–39	0.92 (0.77–1.11)	0.378	0.89 (0.74–1.06)	0.191	0.86 (0.71–1.03)	0.096	0.87 (0.71–1.06)	0.155
≥40	0.73 (0.59–0.91)	0.004	0.71 (0.58–0.88)	0.002	0.63 (0.50–0.80)	< 0.001	0.66 (0.52–0.85)	0.001
Race/ethnicity								
Non-Hispanic White	Ref.		Ref.		Ref.		Ref.	
Non-Hispanic Black	0.83 (0.68–1.01)	0.062	0.83 (0.68–1.01)	0.062	0.79 (0.64–0.98)	0.029	0.75 (0.60–0.93)	0.009
Hispanic	1.18 (0.83–1.69)	0.360	1.18 (0.83–1.69)	0.360	1.11 (0.75–1.64)	0.607	1.08 (0.70–1.67)	0.735
Multiracial	1.01 (0.70–1.44)	0.975	1.01 (0.70–1.44)	0.975	0.92 (0.64–1.32)	0.650	0.99 (0.70–1.39)	0.935
Other	0.92 (0.51–1.68)	0.792	0.92 (0.51–1.68)	0.792	0.82 (0.40–1.66)	0.575	0.72 (0.31–1.67)	0.440
Education level								
Grades 1–11	Ref.		Ref.		Ref.		Ref.	
Grade 12 or GED	0.95 (0.70–1.28)	0.730	0.95 (0.70–1.28)	0.730	0.95 (0.70–1.28)	0.730	0.91 (0.68–1.23)	0.538
College, Associate's or Technical degree	1.07 (0.78–1.48)	0.672	1.07 (0.78–1.48)	0.672	1.07 (0.78–1.48)	0.672	0.97 (0.70–1.35)	0.876
Bachelor's degree	0.85 (0.57–1.27)	0.430	0.85 (0.57–1.27)	0.430	0.85 (0.57–1.27)	0.430	0.79 (0.53–1.17)	0.242
Any postgraduate studies	0.98 (0.62–1.57)	0.945	0.98 (0.62–1.57)	0.945	0.98 (0.62–1.57)	0.945	0.81 (0.49–1.34)	0.412
Household annual income								
≥ \$20,000	Ref.		Ref.		Ref.		Ref.	
\$0 to \$19,999	0.99 (0.83–1.19)	0.942	0.99 (0.83–1.19)	0.942	0.99 (0.83–1.19)	0.942	1.02 (0.85–1.23)	0.800
Employment status								
Employed	Ref.		Ref.		Ref.		Ref.	
Full-time student	0.79 (0.56–1.12)	0.192	0.79 (0.56–1.12)	0.192	0.79 (0.56–1.12)	0.192	0.74 (0.51–1.07)	0.113
Unemployed or retired	1.01 (0.84–1.22)	0.931	1.01 (0.84–1.22)	0.931	1.01 (0.84–1.22)	0.931	1.00 (0.83–1.21)	0.991
Unable to work for health reasons	1.45 (1.07–1.97)	0.017	1.45 (1.07–1.97)	0.017	1.45 (1.07–1.97)	0.017	1.49 (1.10–2.01)	0.009
Other	1.12 (0.75–1.69)	0.576	1.12 (0.75–1.69)	0.576	1.12 (0.75–1.69)	0.576	1.17 (0.77–1.77)	0.468
Homelessness in the past 12 months								
No	Ref.		Ref.		Ref.		Ref.	
Yes	1.54 (1.23–1.92)	< 0.001	1.54 (1.23–1.92)	< 0.001	1.54 (1.23–1.92)	< 0.001	1.50 (1.20–1.88)	< 0.001

(continued)

TABLE 3. (CONTINUED)

	Model 1		Model 2		Model 3		Model 4	
	Estimate, aPR (95% CI)	p	Estimate, aPR (95% CI)	p	Estimate, aPR (95% CI)	p	Estimate, aPR (95% CI)	p
Sexual orientation disclosure								
Yes							Ref.	0.080
No							0.74 (0.53–1.04)	
Marital status							Ref.	
Married or cohabiting with a man							0.66 (0.33–1.29)	0.222
Married or cohabiting with a woman							1.18 (0.97–1.42)	0.095
Not married or cohabiting								
QICu	2403.5		2382.8		2254.2		2126.3	

Bold denotes significance at a level of $p < 0.05$.

Nested models: first, adjusting by study wave and age (Model 1); then adding race/ethnicity (Model 2); next adding socioeconomic factors, including education level, household annual income, employment status, and homelessness (Model 3); and finally adding sexual orientation disclosure and marital status as relational factors (Model 4).
aPR, adjusted prevalence ratio; CI, confidence interval; QICu: quasi-likelihood under the Independence model Criterion.

Effect of stigma on depressive symptoms by sexual orientation identity

Within the context of the minority stress model,^{18,32} one might expect that those reporting enacted stigma experiences would more frequently show depressive symptoms. Our findings confirm the association between stigma and prevalence of depressive symptoms, but not the cumulative effect of stigma experiences or our general hypothesis about different patterns of association for gay and bisexual men. Physical assault was the enacted stigma dimension most strongly associated with depressive symptoms, followed by discrimination and verbal harassment.

Interactions among enacted stigma dimensions were all statistically significant. The aPR of the interactions between two stigma dimensions were <1 , indicating that experiencing two enacted stigma dimensions did not increase the risk of presenting depressive symptoms. This pattern was similar for individuals who reported experiences in all of the three enacted stigma dimensions (aPR 2.03; not tabulated), very close to the aPR of individuals reporting only physical assault experiences. This suggests a saturation phenomenon instead of a cumulative effect of stigma experiences on depressive symptoms. In the case of men who experienced physical assault, for example, additionally experiencing discrimination and/or verbal harassment did not increase the strength of the association between stigma experiences and depressive symptoms.

Stigma measurement

No DIF on the enacted stigma scale indicated that gay and bisexual men answered similarly. However, as this scale focuses on experiences that only happen if someone knows or assumes same-sex attraction, it does not capture the unique challenges related to the disclosure of a bisexual orientation or identity. To address this limitation, specific instruments to assess bisexual stigma have been developed, such as the Anti-Bisexual Experiences Scale⁵² and the Bisexual Identity Inventory,⁵³ covering dimensions related to internalized stigma. A systematic review⁵⁴ has found that internalized stigma could be more important than enacted stigma experiences when considering mental health outcomes. Internalized stigma in the current context refers to the internalization of anti-LGB social attitudes by sexual minority individuals.⁵⁵ Further research measuring both enacted and internalized stigma is needed to understand the effect of stigma on poor mental health.

Demographic and social characteristics of gay, bisexual, and heterosexual participants

Similar to Baltimore's general population, the majority of the participants in this study identified as non-Hispanic Black, but this proportion was significantly higher among bisexual than among gay men (79.8% vs. 66.3%, $p < 0.001$). Previous research proposed a dynamic ecological model in which race/ethnicity was an important factor in terms of how men organize, interpret, and share their sexual identities.⁵⁶ The intersection of race/ethnicity and sexual and masculine identities influences sexual behavior, as it limits (and expands) men's options for what may be considered acceptable sexual behavior.^{56,57} Gay men were younger than

TABLE 4. GENERALIZED ESTIMATING EQUATION USING A POISSON DISTRIBUTION TO ASSESS THE ASSOCIATION OF SEXUAL ORIENTATION IDENTITY, ENACTED STIGMA, AND OTHER CHARACTERISTICS WITH CLINICALLY RELEVANT DEPRESSIVE SYMPTOMS (DEPENDENT VARIABLE) AMONG GAY AND BISEXUAL MEN IN THE BALTIMORE-TOWSON-COLUMBIA METROPOLITAN STATISTICAL AREA, 2011 AND 2014

	Model 1		Model 2		Model 3		Model 4	
	Estimate, aPR (95% CI)	p	Estimate, aPR (95% CI)	p	Estimate, aPR (95% CI)	p	Estimate, aPR (95% CI)	p
Intercept	0.27 (0.21–0.34)	<0.001	0.26 (0.19–0.35)	<0.001	0.26 (0.18–0.38)	<0.001	0.22 (0.14–0.33)	<0.001
Sexual orientation identity								
Gay	Ref.		Ref.		Ref.		Ref.	
Bisexual	1.28 (1.08–1.52)	0.005	1.27 (1.06–1.51)	0.008	1.10 (0.91–1.32)	0.335	1.06 (0.87–1.30)	0.551
Enacted stigma dimensions and their interactions								
Verbal harassment								
No	Ref.		Ref.		Ref.		Ref.	
Yes	1.52 (1.19–1.93)	0.001	1.51 (1.19–1.93)	0.001	1.42 (1.12–1.80)	0.004	1.39 (1.09–1.77)	0.008
Discrimination								
No	Ref.		Ref.		Ref.		Ref.	
Yes	1.79 (1.38–2.32)	<0.001	1.78 (1.37–2.31)	<0.001	1.83 (1.40–2.37)	<0.001	1.76 (1.35–2.29)	<0.001
Physical assault								
No	Ref.		Ref.		Ref.		Ref.	
Yes	2.14 (1.39–3.30)	0.001	2.13 (1.39–3.28)	0.001	2.00 (1.28–3.13)	0.003	2.04 (1.29–3.22)	0.002
Verbal × Discrimination								
No	Ref.		Ref.		Ref.		Ref.	
Yes	0.49 (0.33–0.75)	0.001	0.50 (0.33–0.76)	0.001	0.45 (0.30–0.69)	<0.001	0.48 (0.31–0.75)	0.001
Verbal × Physical								
No	Ref.		Ref.		Ref.		Ref.	
Yes	0.35 (0.17–0.72)	0.005	0.36 (0.17–0.73)	0.005	0.39 (0.19–0.81)	0.011	0.41 (0.20–0.82)	0.012
Discrimination × Physical								
No	Ref.		Ref.		Ref.		Ref.	
Yes	0.39 (0.18–0.84)	0.016	0.39 (0.18–0.84)	0.016	0.29 (0.12–0.70)	0.006	0.29 (0.11–0.73)	0.009
Verbal × Discrimination × Physical								
No	Ref.		Ref.		Ref.		Ref.	
Yes	6.26 (2.19–17.91)	0.001	6.26 (2.19–17.92)	0.001	7.80 (2.52–24.16)	<0.001	7.23 (2.30–22.77)	0.001
Wave								
2011	Ref.		Ref.		Ref.		Ref.	
2014	0.97 (0.82–1.14)	0.693	0.97 (0.82–1.15)	0.728	1.02 (0.87–1.21)	0.782	1.02 (0.87–1.21)	0.777
Age groups, years								
18–24	Ref.		Ref.		Ref.		Ref.	
25–39	0.96 (0.79–1.17)	0.695	0.96 (0.79–1.18)	0.718	0.96 (0.78–1.19)	0.738	0.97 (0.79–1.20)	0.806
≥40	1.19 (0.96–1.47)	0.112	1.19 (0.96–1.48)	0.107	1.11 (0.88–1.40)	0.358	1.11 (0.89–1.40)	0.354
Race/ethnicity								
Non-Hispanic White	Ref.		Ref.		Ref.		Ref.	
Non-Hispanic Black	1.04 (0.82–1.30)	0.758	1.04 (0.82–1.30)	0.758	0.86 (0.69–1.08)	0.193	0.84 (0.67–1.06)	0.140
Hispanic	0.99 (0.58–1.67)	0.960	0.99 (0.58–1.67)	0.960	1.01 (0.61–1.67)	0.978	1.02 (0.61–1.71)	0.931

(continued)

TABLE 4. (CONTINUED)

	Model 1		Model 2		Model 3		Model 4	
	Estimate, <i>aPR</i> (95% CI)	p	Estimate, <i>aPR</i> (95% CI)	p	Estimate, <i>aPR</i> (95% CI)	p	Estimate, <i>aPR</i> (95% CI)	p
Multiracial			1.06 (0.72–1.54)	0.779	0.96 (0.66–1.40)	0.827	0.95 (0.65–1.40)	0.812
Other			1.08 (0.63–1.84)	0.790	0.97 (0.53–1.79)	0.923	0.98 (0.51–1.86)	0.944
Education level								
Grades 1–11					Ref.		Ref.	
Grade 12 or GED					0.94 (0.74–1.20)	0.634	0.95 (0.74–1.20)	0.647
College, Associate's or Technical degree					0.96 (0.74–1.24)	0.757	0.95 (0.74–1.24)	0.717
Bachelor's degree					0.72 (0.51–1.02)	0.068	0.73 (0.52–1.03)	0.071
Any postgraduate studies					0.81 (0.51–1.27)	0.356	0.82 (0.52–1.28)	0.385
Household annual income								
≥ \$20,000					Ref.		Ref.	
\$0 to \$19,999					1.26 (1.03–1.55)	0.026	1.21 (0.98–1.49)	0.079
Employment status								
Employed					Ref.		Ref.	
Full-time student					1.51 (1.02–2.24)	0.042	1.51 (1.03–2.23)	0.037
Unemployed or retired					1.32 (1.07–1.63)	0.010	1.30 (1.05–1.61)	0.015
Unable to work for health reasons					1.78 (1.36–2.33)	<0.001	1.78 (1.36–2.34)	<0.001
Other					1.65 (1.20–2.27)	0.002	1.60 (1.15–2.22)	0.005
Homelessness in the past 12 months								
No					Ref.		Ref.	
Yes					1.10 (0.87–1.38)	0.417	1.08 (0.86–1.36)	0.488
Sexual orientation disclosure								
Yes					Ref.		Ref.	
No					1.10 (0.88–1.38)		1.10 (0.88–1.38)	0.411
Marital status								
Married or cohabiting with a man					Ref.		Ref.	
Married or cohabiting with a woman					0.99 (0.56–1.78)		0.99 (0.56–1.78)	0.984
Not married or cohabiting					1.35 (1.08–1.68)		1.35 (1.08–1.68)	0.008
QICu	2187.3		2180.2		2076.6		2095.9	

Bold denotes significance at a level of $p < 0.05$.

Nested models: first, adjusting by study wave and age (Model 1); then adding race/ethnicity (Model 2); next adding socioeconomic factors, including education level, household annual income, employment status, and homelessness (Model 3); and finally adding sexual orientation disclosure and marital status as relational factors (Model 4).

bisexual men, and heterosexual men were the oldest group (27.7%, 44.7%, and 49.1% ≥ 40 years old). Some evidence has suggested that a stronger internal dilemma of violating male gender role expectations⁵⁸ and nonconformity of same-sex attraction⁵⁹ among older generations may underlie some of these differences.

In this study, men who identified as gay had the highest socioeconomic position, measured by higher education level, employment rates, and household income, and less homelessness, followed by bisexual and heterosexual MSM, the latter presenting the most disadvantaged position. Other studies have also reported socioeconomic differences in this direction between gay and bisexual men.⁷ The mechanisms underlying these associations would benefit from further study. Our findings suggest that this worse socioeconomic position exacerbates depressive symptoms among bisexual men showing that social instability (e.g., in housing, employment, income, criminal justice, and social relationships) can exacerbate stress and contribute to poor mental health outcomes among these men. Socioeconomic disadvantages may also partly explain the high prevalence of depressive symptoms among heterosexual MSM in our sample. Together, these findings suggest a need to better understand the intersectional relationship between sexual orientation and socioeconomic position.

Limitations and strengths

First, it is important to note the high prevalence of relevant depressive symptoms reported by heterosexual men (59.3%), to whom the enacted stigma scale was not administered. Second, since the sample only included venue-based MSM, participants may not be representative of gay and bisexual men who do not socialize in MSM-identified spaces and suburban or rural men, where stigma is likely to be higher.^{60–62} It is also important to note that our sample of MSM did not include bisexual men who were not sexually active with men. Third, although GEE models were constructed to account for correlations among individuals recruited in each venue and date, it is possible that some clustering remains unaccounted for, thus either underestimating or overestimating variability. Fourth, as data were collected at two time points, differences found between the 2011 and 2014 waves could be due to either recruitment processes or societal changes. To take this into account, the source wave was included in the models for adjustment. Fifth, enacted stigma and CES-D-10 scales being administered by interviewers, and the difference in time frames (no specific time vs. the past week), may have biased answers and modified results. Finally, the survey design was cross-sectional, which constrains the assessment of causality.

One of the strengths of this study is the large sample size of bisexual ($n = 331$) and gay men ($n = 671$). In addition, it is the first study from the NHBS which included use of the CES-D-10 to measure depressive symptoms. This allowed us to understand in further detail the relationship between mental health and enacted stigma among gay and bisexual men.

Conclusion

This study confirms the association between enacted stigma and depressive symptoms among gay and bisexual

men, but, contrary to our a priori hypothesis, sexual orientation did not modify this association. The bisexual group presented other psychosocial stressors, which may explain their higher prevalence of depressive symptoms.

The high levels of verbal harassment, discrimination, and physical assault reported by gay and bisexual men, and their negative effect on mental health, indicate the need to develop new effective public health strategies to avoid these mental health consequences of homophobic and biphobic culture. Strategies may include advocating for education on sexual diversity, developing community-building or empowerment interventions to prevent stigma, and designing educational interventions for confronting and coping with mistreatment that consider the specific characteristics of gay and bisexual men.

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Supplementary Material

Supplementary Table S1
Supplementary Table S2

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