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ARTICLE

Community stigma, internalized homonegativity, enacted stigma, and HIV testing among young men who have sex with men

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Abstract

HIV testing is an important HIV prevention strategy for young men who have sex with men (YMSM) in the United States, but the relationships between community- and individual-level aspects of sexuality-related stigma and HIV testing among YMSM are unknown. Data from a cross-sectional survey included 334 HIV-negative YMSM in Detroit. Multinomial logistic regression was used to determine if place-based community prejudice perceptions, internalized homonegativity, and sexuality-related discrimination were associated with HIV testing. Increased perceptions of community prejudice were associated with lower odds of never testing, while increased internalized homonegativity was associated with greater odds of never testing. Experiences of discrimination had no association with HIV testing. Understanding the influence of sexuality-related stigma (and especially place-specific, community-level stigma) on HIV testing could help improve public health messaging to increase HIV testing among YMSM.

1 | INTRODUCTION

In 2015, gay, bisexual, and other men who have sex with men (MSM) accounted for 67% of new HIV infections, with young MSM (YMSM) between 13 and 24 years of age (and especially Black YMSM) representing the greatest burden of new HIV diagnoses among MSM (Centers for Disease Control and Prevention [CDC], 2016). In order to increase identification of new HIV infections, link individuals to HIV treatment, and provide HIV negative individuals with efficacious interventions (e.g., PrEP), the CDC recommend that MSM test for HIV every three to six months (i.e., 2–4 times per year; CDC, 2014); however, less than 20% of MSM test that frequently (Khosropour & Sullivan, 2011).

While much research has focused on the individual factors that drive testing, there is increased recognition that structural and multilevel factors, such as sexuality-related stigma and discrimination, may function as drivers of HIV testing behavior (Arnold, Rebchook, & Kegeles, 2014; Holtzman et al., 2016; Pachankis et al., 2015; Pyun et al., 2014). Though research has examined the relationships between different types of stigma and HIV testing among MSM (Arnold et al., 2014; Holtzman et al., 2016; Pyun et al., 2014), few studies have explored the role that community-level,

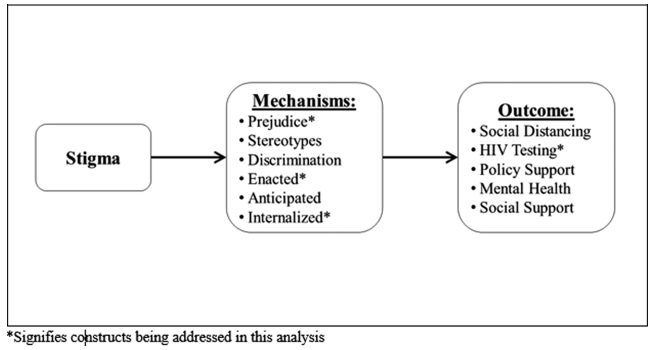

FIGURE 1 Adapted version of Earnshaw & Chaudoir's (2009) Conceptual framework illustrating The Relationship between Stigma and HIV-related outcomes

sexuality-related stigma plays in the HIV testing behaviors of YMSM. This study examines the associations between HIV testing among YMSM and multiple aspects of sexuality-related stigma, including place-based community-level perceptions of prejudice, internalized homonegativity (IH), and experiences of enacted sexuality-related stigma.

Stigma may manifest as external and internal processes and occur across socioecological levels, including individual (e.g., internalization of negative stereotypes among the minority group; experiences of microaggressions and discrimination), community (e.g., community climate, perceptions of sexual prejudice), and structural levels (e.g., public policies, cultural norms, cultural ideologies; Grossman & Stangl, 2013; Link & Phelan, 2001; Paceley, Goffnett, & Gandy-Guedes, 2017). Earnshaw and Chaudoir's (2009) conceptual framework, illustrating how HIV-related stigma influences HIV-related health outcomes, is a useful framework for understanding the relationships between mechanisms of stigma (e.g., perceived community prejudice, IH, enacted stigma) and HIV-related outcomes. Though this framework has been used to specifically understand HIV-related stigma, we expand this to conceptualize the relationship between sexuality-related stigma and HIV testing behaviors among YMSM (Figure 1).

Perceived community prejudice is a mechanism that functions both internally and externally; living in a community with more pervasive prejudice may increase perceptions of stigma, but an individual who is more aware of stigma and generally perceives more stigma may more easily identify prejudice within their community (Goffman, 2009). Therefore, it is important to consider perceived sexuality-related stigma not simply at an individual level (i.e., the expectation that an individual will experience rejection or discrimination), but also at a community level (i.e., the level of expectation that MSM in a community will experience rejection or discrimination).

Lesbian, gay, bisexual, and transgender (LGBT) enclaves may also have more resources that support LGBT individuals (e.g., LGBT-specific organizations at churches, schools; LGBT-specific community-based organizations), which can increase community resilience and reduce minority stress resulting from experiences of stigma (Meyer, 2015). Previous research has found that living in neighborhoods with large LGBT communities and with low levels of sexuality-related stigma and high community acceptance can reduce HIV risk-taking behaviors and increase HIV testing among YMSM (Bauermeister et al., 2015; Buttram & Kurtz, 2013; Frye et al., 2010; Ramirez-Valles, 2002). These findings underscore the importance of building on stigma theory and previous stigma research to further examine the role that community plays in the experiences and perceptions of stigma and HIV testing among YMSM.

It is also important to understand other stigma mechanisms (e.g., IH) that may be related to HIV testing behaviors among YMSM. Developmentally, YMSM may experience IH as they develop, affirm, and become comfortable in their sexual identity (Dempsey, 1994; Gonsiorek, 1988; Rowen & Malcolm, 2003). The links between IH and HIV testing could occur through multiple pathways. Researchers have found that increased IH was associated with never testing for HIV (Holtzman et al., 2016; Pyun et al., 2014). IH may also lead to decreased HIV testing behaviors due to a fear of being perceived as gay or as having sex with men (Brooks, Etzel, Hinojos, Henry, & Perez, 2005; Choi, Lui, Guo, Han, & Mandel, 2006; Pyun et al., 2014), or because men experiencing IH may be less connected with communities of gay

men and therefore have less access to MSM-specific resources and information about HIV (Huebner, Davis, Nemeroff, & Aiken, 2002; Peterson & Jones, 2009).

It is also possible that YMSM with IH may not be tested for HIV because they are unable to relate to MSM-specific messaging used to promote HIV testing (Brooks et al., 2005; Huebner et al., 2002). Notably, however, not all studies find an association between IH and HIV testing. For example, Huebner et al. found that while IH was not associated with the utilization of HIV prevention services, IH was related to the effectiveness of an HIV-prevention intervention (Huebner et al., 2002).

Sexuality-related discrimination (i.e., external enacted stigma) can occur across multiple socioecological levels and is linked to HIV testing through multiple pathways, especially within a context of HIV-related stigma (Arnold et al., 2014; Earnshaw & Chaudoir, 2009). One qualitative study by Arnold et al. (2014) examined how experiences of both sexuality-related discrimination and HIV-related stigma (within a larger societal context of racism) among Black MSM resulted in hesitancy and sometimes refusal to engage in HIV testing. Experiences of discrimination may also disincentivize HIV testing (Arnold et al., 2014; Fay et al., 2011), due to a fear of either experiencing discrimination while accessing healthcare (Fay et al., 2011) or a potential increase in discrimination if others learned about a positive HIV serostatus (Arnold et al., 2014; Chesney & Smith, 1999; Earnshaw, Bogart, Dovidio, & Williams, 2013; Golub & Gamarel, 2013).

In addition, HIV testing may be less likely among MSM who experience sexuality-related discrimination within their social networks (family, peers, churches, etc.) and encounter social rejection and reduced social support (Scott et al., 2014). Taken together, this current literature demonstrates that, in the context of other forms of discrimination, sexuality-related discrimination may have both direct and indirect effects on HIV testing.

Even though each of these separate stigma constructs have a unique effect on HIV testing among YMSM, it is also possible that multiple aspects of stigma occur simultaneously and differentially affect the likelihood of HIV testing. Currently, there are no studies that have examined how perceptions of place-based community prejudice, IH, and experiences of interpersonal discrimination are all associated with HIV testing among YMSM. Therefore, the objective of this study is to examine if perceptions of community prejudice, experiences of IH, and experiences of enacted sexuality-related discrimination are associated with HIV testing among YMSM in the Detroit metropolitan area.

2 | MATERIALS AND METHODS

Data used in this study were collected from May to September 2012 as part of an academic–community partnership, the United for HIV Integration & Policy Project (UHIP). Funded by the MAC AIDS Fund and the Ford Foundation, the academic–community partnership included five partners in the Detroit, Michigan metropolitan area: The Center for Sexuality & Health Disparities at the University of Michigan, the HIV/AIDS Resource Center, AIDS Partnership Michigan, The Ruth Ellis Center, and Detroit Latin@z. The purpose of this partnership was to understand and address the social and structural factors influencing HIV/AIDS among Black and Latino YMSM in the Detroit metropolitan area, and use these data to develop strategies that could reduce structural and community barriers to HIV prevention and care. The university's institutional review board approved all study procedures.

2.1 | Sample

The partnership administered a cross-sectional survey among YMSM who ranged from 18 to 29 years of age, identified as a cisgender male or transgender person, reported currently residing in the Detroit metropolitan area (verified by zip code and IP address), and who reported ever having sex with men. A convenience sample of participants was recruited using in-person and online strategies. In-person recruitment occurred at a variety of gay bars, clubs, and community events that are frequented by the target population; this strategy is often employed for hard-to-reach populations (Muhib et al., 2001). For in-person recruitment, the UHIP partnership also used referrals from staff at community agencies, clinics, and organizations working with YMSM in the Detroit metropolitan area

(e.g., LGBT organizations, AIDS Service Organizations, community and university health clinics). For online recruitment, advertisements were posted on Black Gay Chat Live (BGC Live) and Facebook. MSM recruited through Facebook have been reported to be behaviorally comparable to MSM reported through other venues (Hernandez-Romieu et al., 2014).

For the purpose of this analysis, only cisgender YMSM who have never tested positive for HIV were included (i.e., men who answered that they had a negative HIV serostatus or had never tested for HIV). Since HIV-related disparities were observed between cisgender YMSM and transgender people in our sample (Bauermeister et al., 2016) only cisgender YMSM were included in analysis. In addition, men who already knew that they had a positive HIV serostatus had no reason for repeat HIV testing and therefore were excluded from analysis. Observations that had missing values for categorical independent variables were dropped from the dataset (5.92%, n = 21); most variables did not have any missing data. Mean imputation was used for missing values on continuous variables.

2.2 | Measures

Three outcomes for HIV testing were examined: testing for HIV in 2012; previously testing for HIV, but not in 2012; and never testing for HIV. Participants who had ever had an HIV test indicated in what year they had their last test; because data were collected between May and September in 2012, participants who indicated 2012 had an HIV test within the previous 5–9 months. Throughout the paper, a 2012 test is referred to as a recent HIV test. A nonrecent HIV test is referred to as someone who has been tested in their lifetime, but before 2012. Independent variables included perceived community prejudice, IH, experiences of sexuality-related discrimination, sociodemographic characteristics (age, race, sexual orientation), sexual behavior in the past 30 days (condomless anal intercourse), and experiences with other MSM friends (number of MSM friends, time spent with MSM friends).

2.2.1 | Perceived community prejudice

Perceived community prejudice was measured using the local stigma scale (Herek & Glunt, 1995), a scale that measures perceptions of the presence of sexuality-related prejudice and acceptance in a community. The local stigma scale was adapted for the local Detroit Metro Area context. This scale was used by calculating the mean of answers measuring agreement on seven statements about perceptions of how the local community treats MSM (e.g., Most people in the Detroit Metro Area would not hire a gay/bisexual man to take care of their children). Answers to statements about community acceptance (e.g., Most employers in the Detroit Metro Area will hire a man who has sex with men if he is qualified for the job) were reversed (strongly disagree = 4, strongly agree = 1) and included in the perceived community prejudice scale. The mean community prejudice score was used for analysis (Cronbach's $\alpha = 0.82$).

If there were missing data on any of the seven statements, then the mean value (2.60) for the scale was imputed for that respondent. A dichotomous variable was created to capture the missing responses on the perceived community prejudice scale (1 = missing data, 0 = no missing data) and was included in the model to control for any patterns in missing responses.

2.2.2 | Internalized homonegativity

IH was measured using the internalized homophobia scale, which measures one's own feelings and experiences related to guilt, shame, and social isolation resulting from one's sexual identity (Herek & Glunt, 1995). Typically, this scale is calculated by determining the mean of answers measuring agreement on nine statements about one's own feelings about their identity and behaviors (e.g., I have tried to stop being attracted to men, I would like to get professional help in order to change my sexual orientation) that are answered on a 4-point scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*) (Cronbach's $\alpha = 0.92$).

However, in this sample, many of the respondents (25.45%, n = 85) answered that they strongly disagreed with all of the statements. Therefore, a categorical variable was used to measure IH. Respondents who answered that they strongly disagreed with all statements were defined as having no IH and respondents who answered anything other

than strongly disagree on at least one statement were defined as having some IH. When data were missing for any of the nine statements, respondents were categorized as having no IH if all of the provided answers were strongly disagree and they responded to at least seven of the nine statements. Respondents who did not answer the question for all nine statements, but who answered greater than 1 on any of the responses were categorized as having some IH.

2.2.3 | Sexuality-related discrimination

Experiences of sexuality-related discrimination were measured using a discrimination scale that was originally adapted from Williams, Yu, Jackson, and Anderson (1997) and specifically applied to measure sexuality-related discrimination (Meyer, Frost, Narvaez, & Dietrich, 2006). This scale has been previously utilized among lesbian, gay, and bisexual women and men to examine "chronic, routine, and less overt experiences of unfair treatment" (Meyer et al., 2006). The scale includes nine statements about how often the participant experienced discrimination in the past year (e.g., In the past year have you been treated with less courtesy than others? Received poorer services than others in restaurants or stores?), using a 4-point scale for each question ranging from 1 (*never*) to 4 (*often*) (Cronbach's $\alpha = 0.92$).

However, like the IH scale, many of the respondents answered never to all nine questions, negatively skewing the data. Therefore, a dichotomous variable was created to determine no experiences of sexuality-related discrimination (for participants who answered never on all questions) versus at least some experiences of sexuality-related discrimination (for participants who answered anything greater than never on at least one of the questions). If a participant answered never on all of the questions and answered at least seven of the nine questions, then they were considered to have experienced no discrimination. If a participant did not answer all of the questions, but answered that they experienced discrimination rarely, sometimes, or often on at least one of the questions, then they were considered to have experienced some discrimination.

2.2.4 | Sociodemographic characteristics

City of residence, age, race, education level, sexual orientation, and relationship status were all examined in this analysis. All participants lived in the Detroit Metropolitan Area; this included participants living in the city of Detroit as well as the surrounding region. A dichotomous variable was created indicating whether or not a participant lived in the city of Detroit or the surrounding Detroit metropolitan area. This variable was included in analysis because previous literature demonstrates that where YMSM live in the Detroit Metro Area matters when considering HIV outcomes (Bauermeister et al., 2015).

Participants were asked to indicate their age; this variable was analyzed as a continuous variable. There were no missing data on this variable, so mean imputation was not necessary. Participants indicated their race and ethnicity by checking all that applied among a list of races (White, Black/African American, American Indian/Alaska Native, Asian, Native Hawaiian/Pacific Islander, Other) and by indicating if they were Hispanic/Latino. Respondents who checked more than one box were defined as Multiracial. Due to a small number of responses in each category, American Indian/Alaska Native, Asian, Native Hawaiian/Pacific Islander, Multiracial, and Other were combined into one category defined as other race. Dichotomous variables were created to analyze race and ethnicity (Black/African American, Latino, Other), with White being the referent group.

Participants were also asked about the highest level of education that they had attained and were given nine options (eighth grade or less, some high school, graduated high school/GED, technical school, associate degree, some college, college, some graduate school, graduate school). For the purpose of this analysis, a dichotomous variable was used based on whether or not the participant graduated from high school. Not graduating from high school was defined as an educational attainment of eighth grade or less or some high school and graduating from high school was defined as the selection of any of the other category options for educational attainment. Because the age range of participants was from 18 to 29, using a cutoff beyond high school (e.g., college graduation) would not take into account the fact that some participants were not yet old enough to attain additional schooling.

When asked to describe their sexual orientation, participants were given six options: gay/homosexual, bisexual, straight/heterosexual, same gender loving, MSM, and other. Because the purpose of this analysis was to understand

how community perceptions as well as internal and external experiences of sexuality-related stigma influenced HIV testing behaviors, all identity categories except for being gay/homosexual were collapsed and a dummy variable was used to describe if a participant identified as gay or not. Participants were also asked if they had a current girlfriend/boyfriend or partner and a dichotomous variable was used to measure if participants had a current partner (yes/no).

2.2.5 | Sexual behaviors

For this analysis, condomless anal intercourse (CAI) was used to measure sexual risk-taking because CAI is a known primary risk factor for HIV transmission among MSM. CAI was examined as a dichotomous variable, comparing participants who indicated having CAI (either receptive or insertive) in the past 30 days with participants who did not have CAI in the past thirty days, either because they did not have anal intercourse or because they reported using a condom every time.

2.2.6 | MSM friends

Time spent with male friends who have sex with other men was used as a proxy to examine inclusion in the LGBT community. Participants were asked how many of their male friends had sex with other men (none, a few, some, all). This variable was examined in analysis as a categorical variable; having all MSM friends was used as the reference group. Participants were also asked how much time they spend with MSM friends (none, little, some, a lot). For this variable, spending a lot of time with MSM friends was used as the reference group.

2.3 | Analysis

Analysis was completed using Stata (version 14). We first examined whether likelihood of HIV testing in one's lifetime was associated with our three stigma indicators; we used logistic regression to examine these relationships because the outcome (never vs. ever testing) was binary. Subsequently, we employed multinomial logistic regressions to determine if perceived community prejudice, IH, and/or sexuality-related discrimination were associated with timing of HIV testing behaviors, including recently testing for HIV, not recently testing for HIV, and never testing for HIV. Recently testing was used as the base outcome for comparison to examine how never testing or nonrecent testing compared with the CDC recommendation of testing more frequently (CDC, 2014). Prior to fitting the regression models, we examined correlation among the key constructs; no multicollinearity was found.

3 | RESULTS

A total of 334 participants were included in the analysis. Descriptive statistics and bivariate analyses are presented in Table 1. More participants had a recent HIV test (48.20%, n = 161) than those who had a nonrecent HIV test (30.85%, n = 103) or those who had never been tested (20.96%, n = 70). Nearly half of the sample was non-Hispanic Black (46.71%, n = 156), with 29.64% (n = 99) non-Hispanic White participants, 14.67% (n = 49) Latino/Hispanic participants, and 8.98% (n = 30) participants of a different race. Most participants self-identified as gay (84.73%, n = 283) and most participants graduated from high school, with only 7.78% (n = 26) of participants not completing a high school education. The mean score for perceived prejudice was 2.57 (standard deviation [SD] = 0.62) on the 1–4-point scale. In addition, 74.55% (n = 249) of participants experienced at least some IH and 80.84% (n = 270) experienced at least some discrimination over the past year.

When comparing HIV testing behaviors in a participant's lifetime (never-testing vs. ever-testing), we found that YMSM who had higher scores on the perceived prejudice scale were more likely to ever test for HIV (odds ratio [OR]: 1.68, p = 0.044) and YMSM with IH were less likely to have ever tested for HIV (OR: 5.43, p = 0.001) (Table 2). Experiencing discrimination was not associated with lifetime HIV testing. Other statistically significant variables included

TABLE 1 Descriptive statistics and bivariate analyses for HIV testing behaviors

Variable	Never test mean(SD)	Nonrecent test mean (SD)	Recent test mean(SD)	Total mean (D)	p-value
Perceived prejudice	2.44 (0.58)	2.53 (0.60)	2.66 (0.64)	2.57 (0.62)	0.0342
Age	22.57 (2.84)	23.83 (2.80)	22.51 (2.72)	22.93 (2.82)	<0.001
	Never Test %(n)	**Nonrecent test %(n)**	**Recent test %(n)**	**Total %(n)**	**p-value**
IH					0.175
None present	15.29% (13)	37.65% (32)	47.06% (40)	25.45% (85)	
Present	22.89% (57)	28.51% (71)	48.59% (121)	74.55% (249)	
Discrimination					0.872
None experienced	20.33% (13)	29.69% (19)	50.00% (32)	19.16% (64)	
Experienced	21.11% (57)	31.11% (84)	47.78% (129)	80.84% (270)	
Residence					0.002
Detroit	26.74% (50)	32.62% (61)	40.64% (76)	55.99% (187)	
Not in Detroit	13.61% (20)	28.57% (42)	57.82% (85)	44.01% (147)	
Graduated from high school					0.062
Yes	19.48% (60)	31.82% (98)	48.70% (150)	92.22% (308)	
No	38.46% (10)	19.23% (5)	42.31% (11)	7.78% (26)	
Race					
White	29.29% (29)	40.40% (40)	30.30% (30)	29.6% (99)	<0.001
Black	14.74% (23)	23.72% (37)	61.54% (96)	46.71% (156)	<0.001
Latino	26.53% (13)	34.69% (17)	38.78% (19)	14.67% (49)	0.335
Other	16.67% (5)	30.00% (9)	53.33% (16)	8.98% (30)	0.788
Sexual orientation					0.029
Gay	21.55% (61)	33.22% (94)	45.23% (128)	84.73% (283)	
Not gay	17.75% (9)	17.65% (9)	24.60% (33)	15.27% (51)	
CAI					0.182
Yes	20.14% (29)	36.11% (52)	43.75% (63)	43.11% (144)	
No	21.58% (41)	26.84% (51)	51.58% (98)	56.89% (190)	
Have partner					0.055
Yes	17.02% (24)	37.59% (53)	45.39% (64)	42.22% (141)	
No	23.83% (46)	25.91% (50)	50.26% (97)	57.78% (193)	
Time spent with MSM					0.393
A lot	22.13% (27)	31.97% (39)	45.90% (56)	36.53% (122)	
Some	19.83% (23)	31.03% (36)	49.14% (57)	34.73% (116)	
Little	17.44% (15)	30.23% (26)	52.33% (45)	25.75% (86)	
None	50.00% (5)	20.00% (2)	30.00% (3)	2.99% (10)	
MSM friends					0.002
All	15.22% (14)	31.52% (29)	52.26% (49)	27.54% (92)	
Some	18.70% (23)	23.58% (29)	57.72% (71)	36.83% (123)	
Few	24.76% (26)	39.05% (41)	36.19% (38)	31.44% (105)	
None	50.00% (7)	28.75% (4)	21.43% (3)	4.19% (14)	

(Continues)

TABLE 1 (Continued)

	Never Test %(n)	Nonrecent test %(n)	Recent test %(n)	Total %(n)	p-value
Perceived prejudice missing					0.760
Yes	30.00% (3)	30.00% (3)	40.00% (4)	2.99% (10)	
No	20.68% (67)	30.86% (100)	48.46% (157)	97.01% (324)	
Total	**20.96% (70)**	**30.84% (103)**	**48.20% (161)**	**334**	

Note. SD = standard deviation; IH = internalized homonegativity; CAI = condomless anal intercourse; MSM = men who have sex with men.

TABLE 2 Results from logistic regression comparing never tested versus ever tested (n = 334)

	Odds ratio [95% CI]
Perceived prejudice	**1.68 [1.01, 2.78]***
IH	**0.37 [0.17, 0.78]***
Discrimination	1.22 [0.56, 2.63]
Detroit residence	1.93 [0.92, 4.02]
High school graduate	**5.43 [1.98, 14.93]***
Race	
White	Reference group
Black	**2.42 [1.03, 5.71]***
Latino	0.96 [0.40, 2.30]
Other	2.29 [0.69, 7.54]
Age	1.07 [0.96, 1.19]
Gay self-identification	1.11 [0.45, 2.73]
CAI	0.98 [0.50, 1.90]
Has a main partner	1.76 [0.90, 3.45]
Time spent with MSM	
A lot	Reference group
Some	1.34 [0.65, 2.76]
Little	**2.59 [1.04, 6.46]***
None	0.82 [0.16, 4.19]
MSM friends	
All	Reference group
Some	0.90 [0.39, 2.10]
Few	0.59 [0.23, 1.49]
None	**0.17 [0.04, 0.76]***
Prejudice missing	0.43 [0.09, 2.15]
Constant	0.04 [0.001, 1.02]

Note. CI = confidence interval; IH = internalized homonegativity; CAI = condomless anal intercourse; MSM = men who have sex with men.
*Significant at $p < 0.05$.

graduating from high school, being Black, spending little time with other MSM, and having no MSM friends. Compared with YMSM who did not graduate from high school, the odds of getting an HIV test was 5.43 times higher for YMSM who graduated from high school. In addition, the odds of getting an HIV test were 2.42 times greater among Black YMSM when compared with White YMSM. Spending little time (vs. a lot of time) with other MSM increased the odds

TABLE 3 Results from multinomial logistic regression (unrestricted model) (n = 334)

	Never tested vs. recent test Relative risk ratio [95% CI]	Never tested vs. nonrecent test Relative risk ratio [95% CI]	Nonrecent test vs. recent test Relative risk ratio [95% CI]
Perceived prejudice	**0.58 [0.33,0.99]***	**0.62 [0.35,1.10]***	0.92 [0.58,1.46]
IH	**2.60 1.15,5.85***	**2.60 [1.14,5.92]***	1.00 [0.53,1.89]
Discrimination	0.93 [0.41,2.14]	0.73 [0.30,1.78]	1.28 [0.61,2.66]
Detroit residence	0.52 [0.24,1.15]	0.50 [0.21,1.16]	1.05 [0.54,2.04]
High school graduate	**0.18 [0.06,0.56]***	**0.19 [0.05,0.66]***	0.99 [0.29,3.31]
Race			
White	Reference group		
Black	**0.28 [0.11,0.70]***	0.80 [0.30,2.14]	**0.34 [0.15,0.77]***
Latino	0.89 [0.33,2.39]	1.17 [0.44,3.14]	0.76 [0.31,1.88]
Other	0.36 [0.10,1.26]	0.61 [0.16,2.37]	0.58 [0.20,1.68]
Age	1.01 [0.90,1.14]	**0.85 [0.75,0.99]***	**1.19 [1.08,1.32]***
Gay self-identification	1.18 [0.46,3.04]	0.55 [0.18,1.69]	2.12 [0.87,5.17]
CAI	1.30 [0.63,2.66]	0.75 [0.35,1.58]	1.73 [0.94,3.18]
Has a main partner	0.64 [0.31,1.32]	0.52 [0.25,1.10]	1.22 [0.67,2.23]
Time spent with MSM			
A lot	Reference group		
Some	0.74 [0.34,1.61]	0.82 [0.36,1.85]	0.91 [0.46,1.78]
Little	0.32 [0.12,0.86]	0.50 [0.18,1.40]	0.64 [0.29,1.41]
None	0.74 [0.11,5.08]	2.52 [0.44,14.18]	0.29 [0.03,2.70]
MSM friends			
All	Reference group		
Some	0.85 [0.35,2.07]	1.70 [0.65,4.46]	0.50 [0.24,1.03]
Few	2.50 [0.91,6.84]	1.11 [0.40,3.12]	2.24 [1.00,5.05]
None	**11.80 [1.91,72.93]***	2.51 [0.44,14.18]	4.71 [0.75,29.54]
Prejudice missing	3.33 [0.58,19.32]	1.26 [0.20,8.00]	2.65 [0.51,13.95]
Constant	7.67	**946.76***	**0.01***

Note. CI = confidence interval; IH = internalized homonegativity; CAI = condomless anal intercourse; MSM = men who have sex with men.
*Significant at $p < 0.05$.

of ever testing by 2.59. However, having no MSM friends (compared with having all MSM friends) decreased the odds of ever testing (odds ratio [OR]: 0.17, p = 0.020).

The results from the multinomial logistic regression models are presented in Table 3. When comparing never testing with recent testing, five variables were significantly associated with never testing (perceived community prejudice, IH, graduating from high school, being Black, and having no friends who are MSM). YMSM who scored higher on the perceived community prejudice scale had lower odds of never testing for HIV compared with having a recent HIV test (risk ratio [RR]: 0.58, p = 0.045). On the other hand, greater IH scores increased the odds of never testing versus recent testing (RR: 2.60, p = 0.021). Compared with participants who did not graduate high school, graduating from high school was associated with improved HIV testing behaviors, with an 82% decrease in the odds of never testing versus recent testing (p = 0.003).

When compared with White participants, being Black was also associated with improved HIV testing behaviors, with a 72% decrease in the odds of never testing versus recent testing (p = 0.006). Having no MSM friends, however, was associated with an increase in the odds of never testing when compared with men who indicated that all of their

friends are MSM (RR: 11.80, p = 0.008). No other variables were significantly associated with never testing versus recent testing, including the stigma construct measuring experiences of discrimination. The multinomial regression model estimating never testing versus nonrecent testing had parallel findings to this model (see Table 3).

In the model measuring nonrecent testing versus recent testing, only two variables were statistically significant. None of the sexuality-related stigma variables (perceived community prejudice, IH, and experiences of discrimination) were associated with nonrecent testing. However, both a participant's age and being Black were associated with nonrecent testing, when compared with recent testing. Similar to the model comparing never testing versus recent testing, being Black was associated with improved HIV testing behaviors when comparing nonrecent versus recent testing, with a 66% decrease in the odds of having a nonrecent versus recent test (p = 0.009). On the other hand, older participants had greater odds of having a nonrecent test, compared with a recent test (RR: 1.19, p = 0.001). We observed no other statistically significant associations for nonrecent testing in our main effects model.

4 | DISCUSSION

The results build on Earnshaw and Chaudoir's (2009) conceptual framework, which demonstrates relationships between HIV stigma and testing behavior to illustrate how perceptions of place-based sexuality stigma may also have the potential to influence HIV testing behavior for YMSM. YMSM in Detroit who reported higher perceptions of sexuality-related prejudice in their communities also reported higher odds of HIV testing; however, perceived place-based sexuality-related prejudice was not associated with *timing* since last HIV test. It is possible that YMSM who had previously tested for HIV gain a greater awareness of the sexuality-related prejudice in their communities during test counseling sessions (Bauermeister et al., 2015; Sullivan, 2014), and/or that they react to perceived stigma by participating in pro-LGBT spaces (e.g., LGBT centers, pride events, bars and clubs) where HIV tests are offered (Bauermeister et al., 2015; Bowles et al., 2008). Given the cross-sectional nature of the data, however, these temporal relationships cannot be tested.

It is also possible that the association between increased HIV testing and perceived prejudice is confounded by endogeneity of location. Previous studies have found that MSM are more likely to be tested for HIV if they live in areas where HIV testing services are readily available (Bauermeister et al., 2015); however, these areas may also be characterized by high levels of prejudice (e.g., stigma against people living with HIV) or a greater awareness of prejudice (Parker & Aggleton, 2002).

Finally, an increase in perceived community prejudice may also result in some MSM demonstrating resilience and specifically choosing to get tested to resist sexuality-related prejudice (Scott et al., 2014). For example, MSM may have an increase in perceived prevalence of HIV in the community and a perceived susceptibility of HIV, which could increase HIV testing behaviors (White & Stephenson, 2016). Future research examining and testing these potential explanations are warranted.

IH was associated with YMSM's likelihood of having tested for HIV in their lifetime. One plausible explanation for this relationship is that IH may affect YMSM's comfort in discussing same-sex behaviors with others and decrease their self-efficacy to get tested (Huebner et al., 2002; Pyun et al., 2014); this may be especially salient among YMSM who may experience challenges embracing their sexual minority identities (Coyle, 1998; Harper, Brodsky, & Bruce, 2012). YMSM may be reluctant to adopt HIV testing for fears of being outed, stigma from their providers, or from internal struggles with their identity that reduce both the perceived efficacy and necessity of testing. IH itself may be influenced by local community norms around gender and sexuality: hence, place-based stigma may act to create internalized stigma among YMSM.

YMSM experiencing IH may avoid HIV testing due to increased fears about being identified as gay during the testing process (Brooks et al., 2005; Choi et al., 2006; Pyun et al., 2014)–especially impactful when they themselves are still forming their identity (Dempsey, 1994; Gonsiorek, 1988; Rowen & Malcolm, 2003)–or because they were unable to relate to or unable to access MSM-specific HIV prevention interventions and messaging that promotes increased testing (Huebner et al., 2002). Though this study did not examine outness to providers (i.e., disclosure of one's

sexual identity, same-sex attraction, or sexual behaviors with men), previous research has found that being out and/or disclosing one's sexual identity to one's doctor may explain some of the relationship between IH and HIV testing (Holtzman et al., 2016). Therefore, the relationship between IH, outness, and doctor disclosure may be a plausible reason explaining at least some of the association between IH and HIV testing that was found in the current study. It would be useful for future research to examine these mediating mechanisms in order to clarify the relationship between IH and never testing for HIV.

Though perceptions of community prejudice and IH were both associated with ever testing versus never testing, we found no association between stigma and recency of HIV testing among those who had tested for HIV in the past. While experiences of sexuality-related stigma may be associated with ever testing for HIV, sexuality-related stigma may not have a relationship with timing of HIV testing. In addition, experiences of enacted discrimination were not associated with HIV testing outcomes in the models. These findings contradict previous research suggesting that increased experiences of sexuality-related stigma may reduce HIV testing and increase perceived barriers to access healthcare (Arnold et al., 2014; Fay et al., 2011). While discrimination functions to reinforce stigma and these two concepts are closely related, they are not identical (Grossman & Stangl, 2013; Link & Phelan, 2001).

In this study, external experiences of discrimination were used as an observable measure that explains only one aspect of a stigmatized identity (e.g., sexuality). Although the experiences of discrimination were prevalent in our sample, our measurement of experiences of discrimination was limited in determining an association with HIV testing. Examining the frequency and intensity of experiences of discrimination, in addition to the presence of discrimination, might produce different results. Moreover, it is possible that HIV-related discrimination (e.g., HIV criminalization laws; absence of legal protections for people living with HIV) might be more closely linked to HIV testing behavior than sexuality-related discrimination. Previous literature supports this notion, as researchers have noted that experiences and/or anticipation of HIV-related discrimination or HIV stigma may also be an important indicator of HIV testing behaviors (Arnold et al., 2014; Brooks et al., 2005; Golub & Gamarel, 2013). Future research should consider how discrimination is measured and defined and consider the context of HIV stigma when measuring the relationship between experiences of discrimination and HIV testing.

4.1 | Strengths and limitations

Our study had several strengths. First, our sample consisted of a large racially and ethnically diverse sample of YMSM living in the metropolitan Detroit area. This allowed us to examine the relationships between three different aspects of sexuality-related stigma and HIV testing. This nuanced understanding of sexuality-related stigma, parceled into three different domains and including place-based perceptions of community stigma, allows us to have greater clarity in its relationship to HIV testing. In addition, this study not only examined the overall prevalence of HIV testing among the sample of YMSM, but also, considering CDC guidelines, focused on the frequency of HIV testing.

Our study has several limitations deserving mention. The cross-sectional design did not allow for causal inferences. A longitudinal design would have provided a better understanding of the causal direction of the effect between perceptions of prejudice and HIV testing. Furthermore, a test was considered to be a recent HIV test if the respondent reported having an HIV test in 2012; however, to measure differences in testing based on timing and frequency, it would have been useful to have data that were more aligned with the CDC HIV testing recommendations (CDC, 2014), including the number of times the participants had been tested in the past year and whether or not the participants had taken an HIV test within the past six months. Finally, we did not have access to other variables (e.g., outness, HIV stigma, decisions about why testing did not occur) that could help elucidate some of our findings and allow us to test the mediational mechanisms that we have proposed. Future longitudinal research in this area is warranted.

4.2 | Conclusion

This study provided a useful understanding for how different constructs of sexuality-related stigma that exist in community spaces or are influenced by community spaces are associated with HIV testing behaviors. HIV testing is an

important prevention intervention, especially among YMSM, who bear a disproportionate burden of new HIV infections (CDC, 2016). To improve HIV testing behaviors among YMSM, it is important for future research to examine how sexuality-related stigma at both community and individual levels influences the HIV testing decision process for YMSM. Future research examining the relationship between multiple forms of stigma and HIV testing should continue to understand stigma mechanisms as nuanced processes and build on this to examine the co-occurrence of different types of stigma (e.g., sexuality-based stigma and HIV stigma). In addition, longitudinal research is recommended to test the causal relationships between the experience of stigmas and HIV testing or other HIV prevention behaviors. Understanding the causal relationships between place-based community-level perceptions of sexuality-related stigma, individual-level experiences of sexuality-related stigma, and the decision-making process for HIV testing could help improve public health messaging to increase HIV testing among YMSM.

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