Experienced Homophobia and HIV Infection Risk Among U.S. Gay, Bisexual, and Other Men Who Have Sex with Men: A Meta-Analysis

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Abstract

Purpose: Experienced homophobia—negative treatment and perceptions that gay, bisexual, and other men who have sex with men (MSM) encounter because of their sexual orientations—may promote HIV infection among MSM. We conducted a rapid review and meta-analysis to examine experienced homophobia in relation to HIV infection risk.

Methods: We searched Embase, MEDLINE, PsycINFO, and Sociological Abstracts to acquire data from U.S. studies published during 1992–2017. Studies examined experienced homophobia in relation to sexual risk behavior, poor HIV care continuum engagement, and diagnosed HIV infection. Random-effects models yielded summary odds ratios (ORs) and 95% confidence intervals (CIs).

Results: Experienced homophobia was associated with having any sexual risk behavior (OR = 1.33, 95% CI = 1.25–1.42, I^2 = 89.2%), receptive condomless anal sex (CAS) (OR = 1.33, 95% CI = 1.14–1.56, I^2 = 63.6%), HIV-discordant CAS (OR = 1.66, 95% CI = 1.29–2.13, I^2 = 85.3%), an increased number of sex partners (OR = 1.16, 95% CI = 1.13–1.19, I^2 = 0.0%), diagnosed HIV infection (OR = 1.34, 95% CI = 1.10–1.64, I^2 = 86.3%), and poor HIV care continuum engagement among MSM living with HIV (OR = 1.45, 95% CI = 1.02–2.08, I^2 = 47.0%). Effect sizes for any sexual risk behavior were larger in samples with ≥50% Black or Latino (vs. White) MSM and for family-based mistreatment and perceived sexual minority stigma (vs. other homophobia types).

Conclusion: Experienced homophobia is associated with HIV infection risk among MSM. Its association with sexual risk behavior may be stronger among Black and Latino (vs. White) MSM and for family-based mistreatment and perceived sexual minority stigma (vs. other homophobia types). Research is needed to better understand causality in these relationships and the role of interventions to reduce homophobia.

Keywords: bisexual, gay, homophobia, meta-analysis, social determinants of health, stigma

Introduction

THE IMPACT OF HIV on gay, bisexual, and other men who have sex with men (MSM) warrants an examination of its underlying causes. MSM account for 2% of the U.S. population, but they accounted for 69.9% of new HIV diagnoses in 2017.¹ MSM are 87.9 times as likely as behaviorally heterosexual men to ever be diagnosed with HIV infection.² During 2012–2017, when new HIV diagnoses decreased 21.6% among behaviorally heterosexual men, diagnoses remained stable among MSM (~26,000 new diagnoses annually).¹

Black, Latino, and young (aged ≤29 years) MSM were most disproportionately affected.¹ HIV interventions for MSM have historically focused on individual-level biological and behavioral determinants of HIV infection (e.g., sexually transmitted infections and condomless anal sex [CAS], respectively).³ Individual-level behavior remains the focus of recent interventions that promote adherence to antiretroviral therapy and pre-exposure prophylaxis.⁴

Fundamental cause theory offers a critique to individual-level prevention approaches. The theory argues that social conditions, not individual-level factors, are the underlying

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Abstract presentation: A poster presentation containing some of this article's findings occurred at the 22nd International AIDS Conference in Amsterdam, the Netherlands, July 24, 2018.

causes of disease disparities that exist among privileged and marginalized groups (e.g., heterosexual persons and MSM, respectively).⁵ The reason is that the latter, due to their marginalized social status, have life experiences that inhibit access to health-protective resources,⁶ promote unhealthy behaviors (e.g., substance use) as coping mechanisms,⁶ and inhibit societal responses to health problems that affect them.⁷

Fundamental cause theory is useful for understanding experienced homophobia in relation to HIV infection risk. Psychologist George Weinberg originally introduced “homophobia” in 1972 to denote “fear of homosexuals,”⁸ but nowadays, it connotes society’s negative treatment and perceptions of sexual minority people, including MSM.⁷ Discrimination, harassment, and violence are notable aspects of experienced homophobia.⁹ Like racism and other forms of oppression, homophobia stems from “structural stigma” within societies,¹⁰ but often manifests interpersonally via mistreatment from others.⁹ Its varied manifestations have led researchers to adopt different terms to describe experienced homophobia and social phenomena contributing to it. Examples include “structural stigma,”¹⁰ “enacted stigma,”¹¹ “minority stress,”¹² and “experiences of homophobia.”¹³ Some researchers use broader terms—for example, “heterosexism” and “sexual stigma” and “perceived sexual minority stigma”—that encapsulate all antigay experiences and perceptions.^{9,14,15} In this article, we use “experienced homophobia” to summarize these varied terms, which ultimately point to the negative treatment that MSM encounter because of their sexual orientations.

Experienced homophobia deserves closer attention in HIV research. First, HIV diagnosis rates remain persistently high among MSM despite the remarkably large U.S. investment for domestic HIV care, prevention, and research. During 2013–2017, this investment increased from 22 billion to 26 billion USD annually, and most of this money was earmarked for MSM.¹⁶ This suggests that factors other than individual-level factors addressed in current prevention efforts underlie HIV’s disproportionate impact among MSM. Second, population-based prospective studies, including studies using experimental designs,¹⁷ show that “structural stigma” (one form of experienced homophobia) is predictive of needing medical visits for mental health problems¹⁷ and having psychiatric disorders that can contribute to HIV acquisition.¹⁸ This suggests that experienced homophobia could similarly promote HIV infection. Third, approximately half of U.S. adults express some level of disapproval of same-sex sexual activity.¹⁹ This suggests that MSM may routinely experience homophobia and, inevitably, face its unhealthy consequences.

Measurement issues make it difficult to understand experienced homophobia’s potential impact on HIV infection risk. Researchers commonly use varied measures because homophobia has different manifestations and exists across multiple societal levels (e.g., interpersonal and structural). Because some forms of experienced homophobia, such as physical violence, are perceptibly more harmful than others, its effect might vary by homophobia type. HIV researchers also use various measures to characterize population-level HIV risk (e.g., condom use or number of sex partners). At times, researchers use “stigma” scales that include items indicative of experienced homophobia.¹⁵ Consequently, studies have assessed multiple homophobia measures in relation to multiple risk outcomes but lack an overall characterization of this relationship.

Existing studies illustrate this challenge. “Gay-related discrimination,”²⁰ “experienced homosexual stigma,”²¹ “harassment,”²² and “violence”²³ have been associated with having diagnosed HIV infection, but comparable measures in other studies have not.^{11,24,25} In many cross-sectional studies, different experienced homophobia measures were associated with CAS,^{11,26–38} high numbers of sex partners,³⁹ being in situations that promote vulnerability to CAS (e.g., sex while intoxicated),²⁶ and overall “HIV risk.”⁴⁰ However, prospective studies of <80 MSM in unique subgroups (e.g., caregivers for patients living with AIDS⁴¹) have reported that “sexual minority stress”⁴² and “experiences of discrimination”⁴¹ were not associated with CAS. To date, no study has quantitatively summarized the magnitude of experienced homophobia’s association with HIV infection risk.

We conducted a meta-analysis to fill this gap. We hypothesized that experienced homophobia is associated with (1) behaviors that increase risk for HIV acquisition and transmission and (2) diagnosed HIV infection. We chose a rapid review to ensure timely synthesis and dissemination of findings due to the need for timely data on MSM. In addition, a meta-analysis was ideal because it estimates effect sizes and notes variation that exists within and across studies.⁴³ We summarized this association with attention to different measures of experienced homophobia and HIV infection risk, yielding implications for research and interventions.

Methods

Search strategy

This rapid review followed the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols statement.⁴⁴ Rapid review methodology allows for the critical appraisal of existing research while limiting particular aspects of the systematic review process, such as a formal quality assessment.⁴⁵ We searched Embase (OVID), MEDLINE (OVID), PsycINFO (OVID), and Sociological Abstracts (ProQuest) to acquire U.S. studies published during 1992–2017. In MEDLINE and PsycINFO, we cross-referenced medical subject headings (National Library of Medicine) for MSM (i.e., “homosexuality, male”; “male homosexuality”; “bisexuality”) and experienced homophobia (i.e., “prejudice”). In all four databases, we simultaneously searched using keywords for MSM (i.e., “men who have sex with men,” “homosexual,” “bisexual,” “gay”) and experienced homophobia (i.e., “antigay,” “anti-gay,” “bullying,” “gay-related,” “homophobia,” “homonegative,” “stigma,” “oppression,” “homeless,” and “prejudice”). This broad approach facilitated the inclusion of all studies that might have examined experienced homophobia without referring to it as such (e.g., studies of HIV risk among homeless young men forced to leave home for being gay). We developed this search strategy for a larger study examining experienced homophobia in relation to multiple health outcomes and behaviors. Therefore, we did not include search terms specific to HIV.

Inclusion criteria

Studies included in our analysis had to (1) provide quantitative data describing associations between at least one type of experienced homophobia and at least one health outcome or behavior among MSM; (2) use samples of U.S. residents;

(3) be published in English; and (4) appear in peer-reviewed journals. Due to the nature of our study, we included any study design that provided an association between homophobia and HIV infection risk. We excluded studies that were confounded by any ongoing HIV intervention.

Data abstraction

To ensure a timely screening process, one author reviewed citations and full-text articles identified by the search at the title and abstract levels, followed by the full report. Six members of our research team used a standardized abstraction form to record characteristics and outcomes of studies that met inclusion criteria. Three 2-person teams separately examined one third of the studies. Team members independently abstracted data and then compared abstractions with their partners. Teams discussed and reconciled any coding differences.

We established criteria to standardize the types of data that we abstracted. Bivariate associations were preferred as they provide the most comparable effects across studies. When study authors only provided data from multivariable models, we selected data from the model with the fewest number of covariates. When multiple studies used the same database to provide data for a given outcome, we abstracted data from only the most recent or generalizable study. When authors reported different outcomes from the same database across multiple reports, we ab-

stracted all effect sizes. We abstracted effect size data reported for the entire sample as well as relevant subgroups. This required combining data at the study level when authors only reported by subgroup. We contacted authors to obtain quantitative data when authors only narratively described associations or provided inadequate quantitative data for effect size computations.

Experienced homophobia variables

All studies measured experienced homophobia as negative treatment that MSM encountered because of their actual or perceived sexual orientation. In this meta-analysis, we included an overall variable for experienced homophobia and specific types of homophobia that studies assessed. These types included discrimination (e.g., unfair treatment), verbal harassment (e.g., name calling), family-based mistreatment (e.g., forced housing displacement), physical violence (e.g., being beaten up), and gay-related stress. We also included sexual minority stigma, both perceived (e.g., believing most people in one's community were homophobic) and structural (e.g., county-level proportion of residents who attended non-gay-friendly places of worship). We included the latter because these forms of stigma are precursors, markers, and sequelae of homophobic experiences and are, therefore, important to consider when examining aspects of experienced homophobia that are difficult to measure directly.^{9,10}

FIG. 1. Flow diagram of the study selection process.

HIV infection risk variables

The outcomes of interest included recent (within the past year) CAS, sex under the influence of drugs or alcohol, number of sex partners, and risky sexual situations—which we combined into an index of sexual risk behavior—having diagnosed HIV infection, ever having a diagnosed sexually transmitted infection, and HIV status disclosure (among MSM living with HIV). We also examined nonadherence to antiretroviral therapy, not being retained in HIV care, and having a detectable viral load. However, because we acquired only one effect size for each of these outcomes, we combined these data into a summary outcome indicating poor HIV care continuum engagement.

Effect size calculation and analytic approach

We used standard formulas to transform abstracted data into log odds, which we weighted by the inverse variance and aggregated using the random-effects model.⁴³ The summary effect estimate was calculated using Comprehensive Meta-Analysis Version 2 (Biostat, Englewood, New Jersey). Effects were transformed into odds ratios (ORs) for interpretation. In instances that data in one study needed to be combined (e.g., authors only reported effects separately by race/ethnicity or across homophobia measures or outcomes), we used the fixed-effects model to meta-analytically combine those effect sizes to generate an effect size for our analysis. Regardless of combinations, each meta-analysis could only contain one effect per study. We calculated I^2 to determine the percentage of effect size variability caused by heterogeneity across studies.⁴⁶ I^2 values of 25%, 50%, and 75% indicated low, medium, and high heterogeneity, respectively.

Next, subgroup analyses examined whether summary effect estimates for sexual risk behavior, sex under the influence of drugs or alcohol, number of sex partners, or having diagnosed HIV infection differed by race/ethnicity or age. Effect estimates from studies that contained samples of $\geq 50\%$ Black, Latino, or White MSM were aggregated to obtain summary effect estimates. To determine the effects for young MSM, we aggregated effect estimates from studies that contained $\geq 50\%$ MSM aged ≤ 29 years for each outcome. Summary effect estimates were also calculated for the association between different types of experienced homophobia (e.g., discrimination, physical violence, verbal harassment) and sexual risk behavior, CAS, and having diagnosed HIV infection.

Finally, we assessed publication bias by visual inspection of funnel plot asymmetry⁴⁷ and validated it by Begg and Mazumdar's rank correlation.⁴⁸ In addition, the random-effects fail-safe N was estimated to determine what number of missing studies would be required to nullify the overall mean effect estimate.⁴⁹ Because this study used published secondary data, the Centers for Disease Control and Prevention determined that it was exempt from institutional review board review and approval.

Results

Our search yielded 3362 references. After removing duplicates, non-U.S. studies, and studies that did not include quantitative data necessary for our meta-analysis, 127 studies met inclusion criteria (Fig. 1). Of these, 44 studies yielded 155 unique effect sizes for HIV-related outcomes.^{11,13,15,20–42,50–67}

Some studies used samples in which $\geq 50\%$ of MSM were Black ($n=10$, 22.7%), Latino ($n=14$, 31.8%), White ($n=9$, 20.5%), or young ($n=14$, 31.8%). Nearly all studies used cross-sectional designs ($n=42$, 95.5%). About two fifths ($n=17$, 38.6%) recruited MSM residing in multiple U.S. regions, and most ($n=26$, 59.1%) included some MSM living with HIV (Table 1).

Meta-analysis

Figure 2 and Table 2 display summary ORs and 95% confidence intervals (CIs) for all MSM. Experienced homophobia was associated with having any recent sexual risk behavior (OR=1.33, 95% CI=1.25–1.42, $I^2=89.2\%$, $k=34$), any CAS (OR=1.21, 95% CI=1.13–1.28, $I^2=84.0\%$, $k=22$), receptive CAS (OR=1.33, 95% CI=1.14–1.56, $I^2=63.6\%$, $k=6$), HIV-discordant CAS (OR=1.66, 95% CI=1.29–2.13, $I^2=85.3\%$, $k=4$), and CAS with casual partners (OR=1.58, 95% CI=1.32–1.87, $I^2=44.9\%$, $k=4$). Experienced homophobia was also associated with having sex under the influence of drugs or alcohol (OR=1.33, 95% CI=1.15–1.54, $I^2=60.2\%$, $k=5$), an increased number of sex partners (OR=1.16, 95% CI=1.13–1.19, $I^2=0.0\%$, $k=5$), diagnosed HIV infection (OR=1.34, 95% CI=1.10–1.64, $I^2=86.3\%$, $k=11$), and poor HIV care continuum engagement among MSM living with HIV (OR=1.45, 95% CI=1.02–2.08, $I^2=47.0\%$, $k=3$). No statistically significant association existed between homophobia and having insertive CAS, being in risky sexual situations, ever having a diagnosed sexually transmitted infection, or HIV status disclosure among MSM living with HIV.

TABLE 1. CHARACTERISTICS OF INCLUDED STUDIES THAT MEASURED THE ASSOCIATION BETWEEN EXPERIENCED HOMOPHOBIA AND HIV INFECTION RISK OUTCOMES AMONG GAY, BISEXUAL, AND OTHER MEN WHO HAVE SEX WITH MEN—UNITED STATES, 1992–2017

	Number of studies (%)
Race/ethnicity	
$\geq 50\%$ Black MSM	10 (22.7)
$\geq 50\%$ Latino MSM	14 (31.8)
$\geq 50\%$ White MSM	9 (20.5)
No majority racial/ethnic group	8 (18.2)
Race/ethnicity not reported	3 (6.8)
Age	
$\geq 50\%$ young MSM	14 (31.8)
Not $\geq 50\%$ young MSM	30 (68.2)
Study design	
Cross-sectional	42 (95.5)
Prospective	2 (4.6)
U.S. region	
Midwest	1 (2.3)
Northeast	10 (22.7)
South	7 (15.9)
West	9 (20.5)
>1	17 (38.6)
Included MSM living with HIV	
Yes	26 (59.1)
No	18 (40.9)
Total	44 (100)

MSM, gay, bisexual, and other men who have sex with men.

FIG. 2. Forest plot with summary odds ratios for associations between experienced homophobia and any recent sexual risk behavior among gay, bisexual, and other men who have sex with men in the United States, 1992–2017 ($N=34$).

I^2 values indicated medium or high heterogeneity in findings across most outcomes. To determine if a specific study accounted for the high heterogeneity, we conducted a sensitivity analysis by assessing the impact of sequentially removing one study at a time from the summary effect estimate. The overall effect estimate remained similar and significant after removal of each study. For the overall sexual risk behavior outcome, we found no evidence of publication bias on the basis of visual inspection of the funnel plot and the Begg test ($Z=0.88$; $p=0.19$). The fail-safe N was 3555.

Subgroup analysis

Table 3 displays summary ORs and 95% CIs for studies with $\geq 50\%$ Black, Latino, White, or young MSM. Among studies with $\geq 50\%$ Black MSM, experienced homophobia was associated with having any recent sexual risk behavior (OR = 1.55, 95% CI = 1.28–1.88, $I^2=78.1\%$, $k=8$), CAS (OR = 1.44, 95% CI = 1.06–1.95, $I^2=86.4\%$, $k=6$), receptive CAS (OR = 1.44, 95% CI = 1.09–1.90, $I^2=0.0\%$, $k=2$), and insertive CAS (OR = 1.53, 95% CI = 1.16–2.00, $I^2=0.0\%$,

$k=2$), but not with diagnosed HIV infection. Among studies with $\geq 50\%$ Latino MSM, experienced homophobia was associated with having any recent sexual risk behavior (OR = 1.31, 95% CI = 1.16–1.49, $I^2=76.6\%$, $k=13$), CAS (OR = 1.28, 95% CI = 1.10–1.48, $I^2=61.7\%$, $k=8$), receptive CAS (OR = 1.31, 95% CI = 1.07–1.61, $I^2=79.7\%$, $k=3$), sex under the influence of drugs or alcohol (OR = 1.24, 95% CI = 1.16–1.32, $I^2=0\%$, $k=3$), and diagnosed HIV infection (OR = 1.72, 95% CI = 1.42–2.09, $I^2=0\%$, $k=2$), but not with insertive CAS. Among studies with $\geq 50\%$ White MSM, experienced homophobia was associated with having any recent sexual risk behavior (OR = 1.09, 95% CI = 1.02–1.18, $I^2=68.3\%$, $k=7$) and CAS (OR = 1.03, 95% CI = 1.01–1.06, $I^2=0\%$, $k=4$), but not with diagnosed HIV infection. Among studies with $\geq 50\%$ young MSM, experienced homophobia was associated with having any recent sexual risk behavior (OR = 1.45, 95% CI = 1.25–1.68, $I^2=78.3\%$, $k=12$), but not with CAS or the number of sex partners.

Table 4 displays summary ORs and 95% CIs for any recent sexual risk behavior, CAS, and diagnosed HIV infection by the type of homophobia that MSM experienced. Types of

TABLE 2. SUMMARY ODDS RATIOS FOR THE ASSOCIATION BETWEEN EXPERIENCED HOMOPHOBIA AND HIV INFECTION RISK OUTCOMES AMONG GAY, BISEXUAL, AND OTHER MEN WHO HAVE SEX WITH MEN—UNITED STATES, 1992–2017

Measure	k	Summary OR (95% CI)	I ²
Sexual risk behavior, any	34	1.33 (1.25–1.42)	89.2
CAS, any	22	1.21 (1.13–1.28)	84.0
CAS, receptive	6	1.33 (1.14–1.56)	63.6
CAS, insertive	5	1.19 (0.99–1.43)	53.9
CAS, HIV discordant	4	1.66 (1.29–2.13)	85.3
CAS, casual partners	4	1.58 (1.32–1.87)	44.9
Sex under the influence of drugs or alcohol	5	1.33 (1.15–1.54)	60.2
Number of sex partners	5	1.16 (1.13–1.19)	0.0
Risky sexual situations	3	1.88 (0.95–3.73)	98.6
Diagnosed HIV infection	11	1.34 (1.10–1.64)	86.3
Diagnosed sexually transmitted infection, ever	3	1.21 (0.91–1.60)	40.8
Poor HIV care continuum engagement (MSM living with HIV)	3	1.45 (1.02–2.08)	47.0
HIV status disclosure (MSM living with HIV)	2	1.41 (0.48–4.21)	88.3

Summary ORs >1 indicate greater odds of an outcome among MSM who reported experiencing homophobia compared with MSM who did not report experiencing homophobia.

CAS, condomless anal sex; CI, confidence interval; k, number of effect sizes; OR, odds ratio.

homophobia associated with having any recent sexual risk behavior were general experienced homophobia (OR=1.36, 95% CI=1.20–1.54, $I^2=91.7\%$, $k=14$), discrimination (OR=1.34, 95% CI=1.15–1.56, $I^2=76.6\%$, $k=7$), verbal harassment (OR=1.20, 95% CI=1.05–1.40, $I^2=70.5\%$, $k=5$), family-based mistreatment (OR=1.68, 95% CI=1.40–2.03, $I^2=0.0\%$, $k=3$), physical violence (OR=1.34, 95% CI=1.19–1.52, $I^2=0.0\%$, $k=3$), and perceived sexual minority stigma (OR=1.54, 95% CI=1.17–2.04, $I^2=71.4\%$, $k=4$). However, gay-related stress and structural sexual minority stigma were not associated with recent sexual risk behavior (any). Types of homophobia associated with having CAS were general experienced homophobia (OR=1.24, 95% CI=1.11–1.39, $I^2=82.3\%$, $k=10$), discrimination (OR=1.36, 95% CI=1.15–1.62, $I^2=76.0\%$, $k=7$), and physical violence (OR=1.35, 95% CI=1.13–1.61, $I^2=0.0\%$, $k=2$). However, verbal harassment, family-based mistreatment, and structural sexual minority stigma were not. No specific homophobia types were significantly associated with having diagnosed HIV infection.

Discussion

Consistent with our first hypothesis, experienced homophobia was associated with behaviors that increase HIV infection risk among MSM: CAS (casual, receptive, and HIV discordant), sex under the influence of drugs or alcohol, an increased number of sex partners, and poor HIV care continuum engagement. Among these findings, it is important to note that receptive CAS is the most risky sexual behavior associated with HIV acquisition,⁶⁸ and HIV-discordant CAS indicates the potential for both HIV acquisition and

TABLE 3. SUMMARY ODDS RATIOS FOR THE ASSOCIATION BETWEEN EXPERIENCED HOMOPHOBIA AND HIV INFECTION RISK OUTCOMES IN SAMPLES CONTAINING ≥50% BLACK, LATINO, WHITE, OR YOUNG GAY, BISEXUAL, AND OTHER MEN WHO HAVE SEX WITH MEN—UNITED STATES, 1992–2017

Measure	Black			Latino			White			Young		
	k	Summary OR (95% CI)	I ²	k	Summary OR (95% CI)	I ²	k	Summary OR (95% CI)	I ²	k	Summary OR (95% CI)	I ²
Sexual risk behavior, any	8	1.55 (1.28–1.88)	78.1	13	1.31 (1.16–1.49)	76.6	7	1.09 (1.02–1.18)	68.3	12	1.45 (1.25–1.68)	78.3
CAS, any	6	1.44 (1.06–1.95)	86.4	8	1.28 (1.10–1.48)	61.7	4	1.03 (1.01–1.06)	0.0	5	1.23 (0.88–1.73)	87.7
CAS, receptive	2	1.44 (1.09–1.90)	0.0	3	1.31 (1.07–1.61)	79.7	—	—	—	—	—	—
CAS, insertive	2	1.53 (1.16–2.00)	0.0	2	1.03 (0.97–1.10)	0.0	—	—	—	—	—	—
Sex under the influence of drugs or alcohol	—	—	—	3	1.24 (1.16–1.32)	0.0	—	—	—	—	—	—
Number of sex partners	—	—	—	—	—	—	—	—	—	3	1.22 (0.95–1.56)	23.5
Diagnosed HIV infection	2	0.87 (0.71–1.07)	0.0	2	1.72 (1.42–2.09)	0.0	4	1.24 (0.88–1.75)	65.1	—	—	—

Summary ORs >1 indicate greater odds of an outcome among MSM who reported experiencing homophobia compared with MSM who did not report experiencing homophobia.

TABLE 4. SUMMARY ODDS RATIOS FOR THE ASSOCIATION BETWEEN SPECIFIC TYPES OF EXPERIENCED HOMOPHOBIA AND HIV INFECTION RISK OUTCOMES AMONG GAY, BISEXUAL, AND OTHER MEN WHO HAVE SEX WITH MEN—UNITED STATES, 1992–2017

Homophobia type	Sexual risk behavior, any			CAS			Diagnosed HIV infection		
	k	Summary OR (95% CI)	I ²	k	Summary OR (95% CI)	I ²	k	Summary OR (95% CI)	I ²
General experienced homophobia	14	1.36 (1.20–1.54)	91.7	10	1.24 (1.11–1.39)	82.3	4	1.29 (0.88–1.88)	87.1
Discrimination	7	1.34 (1.15–1.56)	76.6	7	1.36 (1.15–1.62)	76.0	4	1.45 (0.94–2.23)	80.9
Verbal harassment	5	1.20 (1.05–1.40)	70.5	3	1.07 (0.96–1.21)	38.1	4	1.32 (0.87–2.01)	90.1
Family-based mistreatment	3	1.68 (1.40–2.03)	0.0	3	0.83 (0.12–5.70)	99.5	—	—	—
Physical violence	3	1.34 (1.19–1.52)	0.0	2	1.35 (1.13–1.61)	0.0	2	1.60 (0.64–4.00)	72.3
Gay-related stress	4	1.23 (0.83–1.82)	59.6	—	—	—	—	—	—
Perceived sexual minority stigma	4	1.54 (1.17–2.04)	71.4	—	—	—	—	—	—
Structural sexual minority stigma	3	1.26 (0.96–1.66)	90.9	2	1.25 (0.84–1.86)	94.3	—	—	—

Summary ORs >1 indicate greater odds of an outcome among MSM who reported experiencing homophobia compared with MSM who did not report experiencing homophobia.

transmission because it occurs among men with different HIV statuses. Thus, if experienced homophobia increases the risk for these two behaviors, then it would also increase the risk for HIV infection.

Consistent with our second hypothesis, experienced homophobia was associated with having diagnosed HIV infection. We revisit fundamental cause theory to interpret this finding. It is well established that unfavorable social conditions are the underlying reasons that socially marginalized groups experience poorer health than more privileged groups.⁵ In the United States, where heterosexism promotes homophobic attitudes, laws, and policies, it is inevitable that MSM will experience homophobia.⁹ Homophobia limits society's willingness to provide HIV prevention and other health-promoting services to MSM, and it negatively affects society's response to HIV.⁷ Thus, we would expect homophobic experiences, especially when MSM themselves acknowledge and report them, to increase their HIV infection risk. As Stall et al. argued, "[t]he lifelong effects of social marginalization or stigma may ... function in an additive manner to raise levels of high-risk sexual behavior and thus HIV infection itself" (p. 942).⁶⁹

However, it is difficult to ascertain the magnitude of experienced homophobia's effect on HIV infection risk. I^2 values suggest that heterogeneity across studies generated substantial effect size variability. Different sexual risk behavior measures across the included studies may account for some variability. When we examined specific types of CAS (e.g., insertive and receptive), I^2 values were lower compared with I^2 values for any sexual risk behavior, possibly due to the similarity in outcome measures. In stratified analyses, racial/ethnic backgrounds and younger age also appeared to reduce heterogeneity, but to a smaller degree. For sexual risk behavior overall, I^2 values decreased after stratifying by race/ethnicity and younger age compared with the entire sample. Moreover, we observed reductions in I^2 for any CAS among Latino and White MSM compared with the entire sample. Fewer studies included in the stratified analysis and similar populations may account for the reduced heterogeneity.

Experienced homophobia's intensity and effect on HIV infection risk likely vary across MSM subgroups. For example, MSM of color (vs. White MSM) are more often challenged

by masculine gender roles,³³ family expectations,³⁸ and religious norms⁷⁰ that intensify their homophobic experiences. Therefore, MSM of color, who also contend with racism and limited acceptance within White gay communities,^{29,59} likely have fewer psychosocial buffers against homophobia than White MSM. This might explain why effect sizes for any sexual risk behavior and CAS were largest in samples containing mostly Black or Latino (vs. White) MSM.

Different types of experienced homophobia might differentially affect MSM. We found that family-based mistreatment and perceived sexual minority stigma yielded the largest effect sizes. One possible explanation is that family-based mistreatment comes from people whom MSM typically expect to treat them favorably and, therefore, engenders a formidable assault to their personhood.⁷¹ Similarly, perceived stigma stems from awareness of homophobia emanating from friends and families and, arguably, has a notably strong impact on MSM.³² However, our observation that verbal harassment, discrimination, and physical violence were also associated with sexual risk behavior suggests that many manifestations of homophobia affect MSM to some degree. Structural sexual minority stigma was not associated with having sexual risk behavior. This was unexpected given evidence that structural stigma is a robust underlying determinant of health among sexual minority people.¹⁰

Limitations

This study has limitations. First, biases within studies that we included may have affected our results. One notable bias involves measurement and conceptualization. Across studies, authors sometimes used the same measure for different types of experienced homophobia or different measures for the same type of experienced homophobia. This highlights the need for better measurement and clearer conceptualization of different types of homophobia. Second, although we used fundamental cause theory as a framework for understanding experienced homophobia's potential effect on HIV infection risk, our findings alone do not establish causality. Third, most studies examined experienced homophobia among "MSM" (not merely gay- or bisexual-identified men), and they did not differentially examine homophobia among MSM of different sexual identities. Consequently,

our meta-analysis examined experienced homophobia vis-à-vis a behavioral dimension of sexual orientation (i.e., self-reported sex with men) rather than sexual identity despite variability in homophobic experiences among MSM of different sexual identities. Finally, we view associations with only two or three effect sizes as preliminary.

Future research

Future studies could address these limitations and remaining research gaps. More data would help researchers to understand how experienced homophobia potentially affects HIV care continuum engagement at each step of the continuum. Because only one study examined retention in care, antiretroviral therapy adherence, or viral suppression, we had to crudely characterize this relationship using a summary OR. Because we acquired only two effect sizes for diagnosed HIV infection among Black and Latino MSM, and none for young MSM, studies should examine experienced homophobia in relation to this outcome. Furthermore, studies could investigate the relationship between structural sexual minority stigma, which is important for understanding homophobia's impact at the societal level, and HIV infection risk.¹⁰ Finally, studies using prospective population-based designs would be invaluable for characterizing causal pathways linking experienced homophobia and HIV infection risk.

Conclusion

As HIV continues its spread among MSM, interventions addressing experienced homophobia are essential. The most widely disseminated interventions for MSM almost exclusively target individual-level risk behaviors rather than the social factors that contribute to these behaviors.⁷² Our findings, alongside other research on experienced homophobia, suggest that interventions should also target society by addressing homophobia. These interventions might reduce HIV diagnoses among MSM by promoting social environments that are conducive to healthy behaviors.⁷¹ Mass media, social marketing campaigns have considerable promise given their abilities to change community- and society-level attitudes toward MSM. Three of these interventions exist in the United States.^{73–75} Although they have only been implemented in two cities, an evaluation of one of them suggests that it may be efficacious at reducing homophobia if disseminated more widely.⁷⁵ Ultimately, by addressing societal homophobia, MSM can live in health-promoting environments that help to reduce their risk for HIV infection. Devoting greater attention to experienced homophobia in research and interventions could help the United States to achieve its vision of ending the HIV epidemic.

Authors' Contributions

W.L.J.IV. conceptualized the study, served as its lead writer, and created Figure 1 and Tables 1–4. S.A.F. helped to conceptualize the study, oversaw data management, and analyzed the data. C.R.R.-P. analyzed the data, created Figure 2, and wrote part of the Methods section. D.J.G., L.B., P.M.R., and G.A.M. abstracted the study data. All the authors reviewed the article, provided written comments, and approved the article before submission.

Disclaimer

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Acknowledgments

We are grateful to Julia B. DeLuca, MLIS, Mary M. Mullins, MLIS, and Katherine L. Tucker for assistance with the literature search. Richard J. Wolitski, PhD, and John L. Peterson, PhD, provided helpful thoughts on the conceptualization of this article.

Author Disclosure Statement

No competing financial interests exist.

Funding Information

No funding was received for this article.

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