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Factors Associated with PrEP Stigma Among Gay, Bisexual, and Other Men Who Have Sex with Men (gbMSM): A Systematic Review

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ABSTRACT

Gay, bisexual, and other men who have sex with men (gbMSM) are disproportionately affected by HIV. While pre-exposure prophylaxis (PrEP) is highly effective at preventing HIV acquisition, uptake of PrEP among gbMSM is low, which may in part be due to stigma associated with PrEP use. This systematic review aimed to explore experiences of PrEP stigma and to identify factors associated with this. Four databases were searched for papers including terms relating to (i) gbMSM, (ii) PrEP, and (iii) stigma, with narrative synthesis used to analyze results. After screening, 70 studies were included in the final analysis. Experiences of PrEP stigma were found to be characterized by a number of stereotypes and came from a range of sources. Five categories of factors were associated with stigma: (i) healthcare-related factors, (ii) cultural and contextual factors, (iii) socio-demographic factors, (iv) peer-discussion, and (v) psychosocial factors. These findings suggest that stigma can be a common experience for gbMSM. However, some are more at risk than others. Interventions aimed at reducing PrEP stigma may be useful in increasing uptake.

KEYWORDS

PrEP; stigma; gbMSM; gay men; pre-exposure prophylaxis; HIV prevention

Main text introduction

Since the beginning of the HIV epidemic, gay, bisexual, and other men who have sex with men (gbMSM) have been disproportionately affected by HIV (Mayer et al., 2021; Health Protection Surveillance Centre, 2023). Rapid advancements in HIV prevention include pre-exposure prophylaxis (PrEP) – a highly effective medication taken by those who do not have HIV to decrease their chances of acquiring HIV (Centres for Disease Control and Prevention, 2023; Grant et al., 2014; Liu et al., 2016). Despite this, the uptake of PrEP has been slow (Eaton et al., 2017; Parsons et al., 2017). One reason for this may be the stigma surrounding PrEP and those who take it (Golub, 2018). Goffman

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describes stigma as the negative classification and rejection of an individual based on possessing an attribute that is considered discrediting (Goffman, 1963). In this case, PrEP use may be viewed as a discrediting attribute.

While extensive research has been conducted on PrEP effectiveness and acceptability, it is only recently that stigma has begun to be explored in more detail. In a narrative review, Golub noted that PrEP stigma is a significant barrier to uptake, and often disproportionately affects marginalized groups (Golub, 2018). However, to date no systematic reviews have been conducted on this topic. Identifying associates of stigma may offer insights into ways in which PrEP uptake can be increased and pave the way for interventions to reduce stigma. This systematic review aimed to explore gbMSM's experiences of stigma related to PrEP, and to establish the factors associated with experiences of PrEP stigma.

Materials and methods

This review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page et al., 2021) and was registered on PROSPERO (ID: CRD42022327834). The research questions were identified by patient and public involvement (PPI) from a sample of seven gbMSM.

Study selection

Four databases (PubMed, Web of Science, EMBASE, PsycInfo) were searched in May 2022 using terms relating to (i) gbMSM (ii) PrEP, and (iii) stigma (see supplementary appendix for full search terms). A comprehensive search strategy was developed based on previous literature (Murchu et al., 2021; Nguyen et al., 2019; Virendrakumar et al., 2021). Only studies published in English in peer-reviewed journals between 2012-May 2022 that collected primary data from adult gbMSM were considered for inclusion. Studies must have included measures of self-reported anticipated or experienced stigma related to PrEP.

Data screening and extraction

Search results were exported to the web app Rayyan (Ouzzani et al., 2016), which was used to screen and tag articles, and to categorize these as included or excluded. Following the removal of duplicates, two researchers independently screened titles and abstracts, with full text of studies not excluded at this stage subsequently screened. Conflicts were resolved through discussion. The extracted data included author names,

publication year, location, sample size and characteristics, study design, aim, stigma measures, and main findings.

Quality appraisal

Two researchers independently assessed study quality using the Mixed Methods Appraisal Tool, which consists of two screening questions, followed by five specific questions depending on the study designs (Hong et al., 2018). Conflicting appraisals were resolved through discussion, with a third reviewer consulted in cases where the conflict could not be resolved.

Analysis

Due to the wide range of measures used across studies, a meta-analysis was considered inappropriate. Instead, narrative synthesis was used to thematically analyze the data according to (i) the nature of PrEP stigma (ii) sources of stigma, and (iii) factors associated with stigma. This process involved coding extracted data, and subsequently creating themes based on these codes. Some themes were apparent from the original texts (e.g. in cases where authors had explicitly referred to items as stereotypes), while others were inferred by the authors of this review (e.g. coding items as stereotypes based on quotes from participants).

Results

The database search yielded a total of 1614 articles. After duplicates were removed, the titles and abstracts of 889 articles were screened. Of these, 196 articles appeared to meet the inclusion criteria.

Following full-text screening, a total of 70 articles were included in the final analysis (see Figure 1).

Quality appraisal

The majority of included studies ($n = 62$) met all five MMAT criteria and were conducted using the appropriate methods and providing adequate data to substantiate their claims. The remaining were judged to be of medium quality, with none considered low quality (see Table 1).

Study characteristics

Table 1 presents an overview of the included studies. The majority of these ($n = 52$) employed qualitative methods, but quantitative descriptive

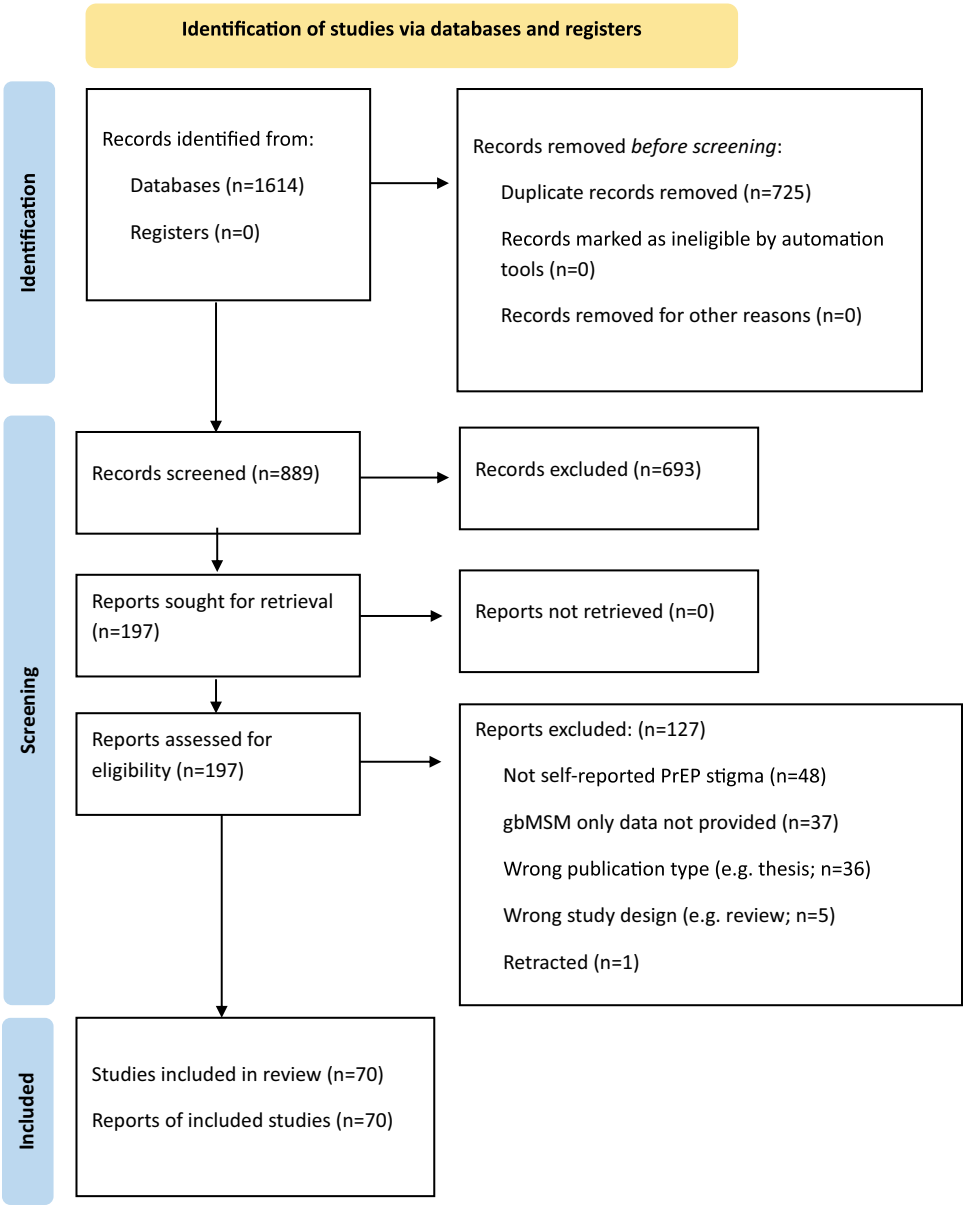

Figure 1. PRISMA flowchart.

($n = 13$) and mixed methods ($n = 5$) studies were also reviewed. Of these, 15 were cross-sectional, and 3 were longitudinal. Most studies ($n = 41$) were based in the USA, however a further 19 different countries were represented.

Sample sizes ranged from 12 to 750 participants, with a total of 6,537 gbMSM participants included overall.

Table 1. Study characteristics.

Authors (Year)	Aim	Study Design	Country	Sample Size (n)	Age (years)	Measure of Stigma	MMAT
Alcantar Heredia & Goldklank (2021)	Explore motivators for PrEP	Qualitative	USA	13	18–44	Self-reported	5
Alt et al. (2022)	Explore the impact of stigma, patient-provider dynamics and patient perception of PrEP on gbMSM's engagement with PrEP in a primary care setting	Qualitative	USA	14	23–57; M = 35.6; SD = 12.16	Self-reported	5
Arnold et al. (2017)	Explore factors that affect PrEP use and retention in care among young gbMSM	Qualitative	USA	30	M = 26.6; SD = 8.2	Self-reported	5
Bartels et al. (2021)	Explore PrEP disclosure experiences and how disclosure is associated with adherence	Qualitative	Guatemala	18	24–62; median = 38	Self-reported	5
Baruch et al. (2020)	Analyze ideas regarding PrEP for future implementation	Qualitative	Mexico	54	20–39	Self-reported	5
Bistoquet et al. (2021)	Understand the motivation of PrEP users	Qualitative	France	12	28–52	Self-reported	5
Bosco et al. (2021)	Identify barriers and facilitators to PrEP and PEP uptake among partnered gbMSM	Qualitative	USA	20	At least one partner in couple required to be 18–29	Self-reported	5
Bourne et al. (2017)	Explore acceptability and willingness to use PrEP	Qualitative	Malaysia	19	20–44; M = 30	Self-reported	5
Brooks et al. (2020)	Explore experiences of PrEP stigma among black gbMSM who use PrEP	Qualitative	USA	26	22–46; M = 31.5; SD = 6.9; median = 31	Self-reported	5
Brooks, Nieto, et al. (2019)	Explore experiences of using PrEP among Latino gbMSM	Qualitative	USA	29	M = 29.83; SD = 6.53	Self-reported	5
Brooks, Landrian, et al. (2019)	Explore experiences of PrEP stigma among Latino gbMSM	Qualitative	USA	29	21–49; M = 30; SD = 6.5; median = 29.8	Self-reported	5
Chakrapani et al. (2015)	Explore the acceptability of PrEP and identify facilitators and barriers to future PrEP uptake	Qualitative	India	71 (gbMSM n = 67; HCPs n = 4)	M = 26; SD = 4.8	Self-reported	5
Chemnasiri et al. (2020)	Evaluate the feasibility, acceptability and patterns of adherence and coverage for three randomly assigned oral FTC/TDF PrEP dosing regimens	Qualitative	Thailand	32	21–50; median = 30	Self-reported	5
Collins et al. (2017)	Explore the impacts of PrEP use on the sexual health of gbMSM	Qualitative	USA	14	26–66; median = 40.5; IQR = 33–48	Self-reported	5

(*Continued*)

Table 1. (Continued).

Authors (Year)	Aim	Study Design	Country	Sample Size (n)	Age (years)	Measure of Stigma	MMAT
Devarajan et al. (2020)	Understand how HCPs who provide PrEP approach sexual healthcare for gbMSM	Qualitative	USA	20	22–47; M = 30.2	Self-reported	5
Driver et al. (2021)	Examine how traditional masculinity and PrEP stigma affect PrEP interest among Black gbMSM	Quantitative descriptive study	USA	123	18–64; M = 30.9; SD = 9.88	Anticipated PrEP stigma: adapted from HIV Stigma Scale (Berger et al., 2001)	4
Dubov et al. (2018)	Explore perceptions and experience of PrEP stigma	Qualitative	USA	43	22–53; M = 30.3; SD = 8.2	Self-reported	5
Elopre et al. (2018)	Understand perceptions of PrEP among young, black gbMSM	Qualitative	USA	25	18–29; median = 24	Self-reported	5
Franks et al. (2018)	Understand experiences of PrEP and study dosing schedules	Qualitative	USA	37 (gbMSM n = 36; gender queer n = 1; only focus group participants [n = 31] included as all are gbMSM)	Focus group: M = 34	Self-reported	5
García et al. (2017)	Develop a measure of Latino gbMSM's attitudes and beliefs toward PrEP and identify associates to suggest culturally appropriate strategies for PrEP promotion among Latino gbMSM	Quantitative descriptive study	USA	159	21–30; M = 25.09	Questions developed by authors	4
Garcia and Saw (2019)	Examine the associations of socioeconomic status with PrEP use, awareness, and access among Latino gbMSM	Quantitative descriptive study	USA	154	21–30	Questions developed by authors	5
Golub et al. (2017)	Examine different types of PrEP-related stereotypes identified by gbMSM and examine sociodemographic and behavioral correlates of these stereotypes	Mixed Methods	USA	160	18–61; M = 32.49; SD = 10.32	Self-reported	5
Gómez et al. (2022)	Assess ways in which gbMSM's relational experiences concerning PrEP are congruent with features of past AIDS activism	Qualitative	USA	103	21–61; M = 32.5; SD = 8.7	Self-reported	5

(*Continued*)

Table 1. (Continued).

Authors (Year)	Aim	Study Design	Country	Sample Size (n)	Age (years)	Measure of Stigma	MMAT
Grace et al. (2018)	Learn from the lived experiences of participants of the PREPARATORY-5 study who had been on PrEP for a year or longer	Qualitative	Canada	16	M = 37.6; SD = 11.02; median=33	Self-reported	5
Harkness et al. (2021)	Examine Latino gbMSM's barriers and facilitators to engaging in HIV prevention and behavioral health services	Qualitative	USA	38	gbMSM: 18–40; M = 28.64; SD = 5.21	Self-reported	5
Huang et al. (2019)	Determine whether revealing 'HIV-, on PrEP' status on smartphone applications might increase uncertainty in communicating about safe sex with others	Qualitative	Taiwan	31	M = 33	Self-reported	5
Hubach et al. (2017)	Assess opinions of and perceived barriers to accessing PrEP	Qualitative	USA	20	22–6; M = 36.40; SD = 11.63	Self-reported	5
Jackson et al. (2012)	Identify predictors of willingness to use PrEP	Quantitative descriptive study	China	570	18–62; M = 27.66; SD = 7.35	Perceived stigma and benefits scale adapted from Sayles et al. (2008)	5
Jaiswal et al. (2018)	Examine the extent to which structural-level barriers are related to PrEP use among young gbMSM	Quantitative descriptive study	USA	492	M = 22.47; SD = 0.63	Questions developed by authors- concern about stigma	4
Jaramillo et al. (2022)	Evaluate how the intersectionality of identities influence views on PrEP and peer navigation	Qualitative	USA	25	52% under 30; 48% 30+	Self-reported	5
Jaspal and Daramilas (2016)	Explore perceptions and understandings of PrEP	Qualitative	UK	20	18–48; M = 31.6	Self-reported	5
Karuga et al. (2016)	Document willingness to take PrEP and barriers to uptake and adherence	Mixed Methods	Kenya	55	Median = 24.9; IQR = 5; 89% aged 18–29	Self-reported	5
Kimani et al. (2021)	Assess PrEP adherence by measuring tenofovir-diphosphate levels and explore motives for PrEP persistence	Mixed Methods	Kenya	53 (gbMSM n = 42; trans women n = 11)	Not specified	Self-reported	5
Klassen et al. (2017)	Explore education sources and acceptability of new prevention technologies (NPTs) among early adopters of NPTs	Qualitative	Canada	15	22–58; M = 38; median = 36	Self-reported	5

(*Continued*)

Table 1. (Continued).

Authors (Year)	Aim	Study Design	Country	Sample Size (n)	Age (years)	Measure of Stigma	MMAT
Klein and Washington (2020)	Compare younger and older gbMSM to determine familiarity with PrEP, willingness to learn about PrEP, perceptions of stigma relating to PrEP, and perceptions of barriers to PrEP adoption	Quantitative descriptive study	USA	250	Younger (18–39; n = 197) vs older (50+; n = 53)	22-item PrEP Stigma Scale (Klein & Washington, 2019)	3
Lau et al. (2022)	Delineate the attributes of an optimal PrEP service model	Qualitative	Hong Kong	20	26–52	Self-reported	5
S. Lee et al. (2019)	Test the feasibility and acceptability of PrEP delivered at a pilot clinic	Quantitative descriptive study	Hong Kong	57	Median = 32; IQR = 27–40	Self-reported	5
J. J. Lee et al. (2022)	Examine the feasibility and acceptability of using social media to facilitate HIV testing and PrEP uptake among Latino immigrant gbMSM	Qualitative	USA	54	M = 27; SE = 0.53	Self-reported	5
Lin et al. (2022)	Understand PrEP acceptability and service use challenges	Mixed Methods	China	489	18–25 (32.11%) 26–30 (43.97%) 31+ (23.93%)	Self-reported	5
Magno et al. (2019)	Assess knowledge, willingness, and barriers to PrEP use	Qualitative	Brazil	32	M = 26	Self-reported	5
Maksut et al. (2018)	Examine awareness of PrEP among Black gbMSM and determine factors associated with PrEP awareness	Quantitative descriptive study	USA	147	18–59; M = 30.61; SD = 10.28	Perceived healthcare-related discrimination- adapted from Wilson & Yoshikawa, 2007; 3 about discrimination due to race, 3 about discrimination due to sexual orientation	3
Maloney et al. (2017)	Describe the context of stigma in healthcare settings and explore geographical variability	Qualitative	USA	24	Median = 48; IQR = 40–52	Self-reported	5

(*Continued*)

Table 1. (Continued).

Authors (Year)	Aim	Study Design	Country	Sample Size (n)	Age (years)	Measure of Stigma	MMAT
Meyers et al. (2021)	Investigate factors associated with PrEP uptake and regimen choice	Quantitative descriptive study	China	412	Inclusion criteria: 18–65 PrEP users: M = 33.10; SD = 9.00 Non-PrEP users: M = 35.69; SD = 10.50 Daily Regimen: M = 33.07; SD = 9.17 2-1-1 Regimen: M = 33.15; SD = 8.82	Adapted from PrEP-User Stereotypes scale (Calabrese etal., 2018)	4
Mimiaga et al. (2014)	Explore perceived partnership-level influences on PrEP use and adherence among high-risk gbMSM who report regular club drug use	Qualitative	USA	40	M = 39; SD = 11.23	Self-reported	5
Mpunga et al. (2021)	Determine awareness of PrEP, factors affecting PrEP willingness, potential barriers to PrEP use and adherence	Qualitative	Malawi	109	18–24 (19.3%) 4625–29 (15.6%) 30–34 (12.8%) 35–40 (27.5%) 41+ (24.8%)	Self-reported	5
Newman et al. (2018)	Explore experiences of considering, accessing, and using/not using PrEP and understand emerging sexual health, social and community issues	Qualitative	Canada	29	M = 36.7; SD = 8.2	Self-reported	5
Nguyen et al. (2021)	Assess PrEP acceptability, potential barriers and facilitators, and preference for PrEP service accessibility and delivery	Qualitative	Vietnam	30	M = 23.9 18–22 (40%) 23–30 (53.3%) Over 30 (6.7%)	Self-reported	5
Owens et al. (2020)	Explore PrEP health care experiences	Qualitative	USA	34	21–62; M = 35.35; SD = 11.07	Self-reported	5
Pantalone et al. (2020)	Explore factors that influence PrEP user's decisions about sexual behaviors and sexual communication practices	Qualitative	USA	103	21–61; M = 32.5; SD = 8.7	Self-reported	5
Philbin et al. (2016)	Examine how all levels of the ecological framework must be addressed for PrEP to be successfully implemented	Qualitative	USA	48 (gbMSM n=31; community stakeholders n = 17)	M = 29 18–24 (54.84%) 25+ (45.16%)	Self-reported	5

(*Continued*)

Table 1. (Continued).

Authors (Year)	Aim	Study Design	Country	Sample Size (n)	Age (years)	Measure of Stigma	MMAT
Puppo et al. (2020)	Investigate social and relational evolutions associated with PrEP use	Qualitative	France	68	Median = 38.1; IQR = 31.5–46.6	Self-reported	5
Quinn et al. (2020)	Understand the influence of peers and social networks on Black gbMSM's perceptions of and decisions about PrEP use	Qualitative	USA	46	19–37; M = 25; SD = 3.8	Self-reported	5
Refugio et al. (2019)	Investigate the feasibility of a telehealth PrEP intervention	Quantitative descriptive study	USA	21	18–25; median = 22	Self-report survey	4
Remy et al. (2020)	Identify factors conducive to success in overcoming known barriers to PrEP use in Black gbMSM.	Qualitative	USA	12	25–57; M = 32.1 18–25 (16.7%) 26–34 (66.7%) 35+ (16.7%)	Self-reported	4
Reyniers et al. (2021)	Explore how PrEP users managed PrEP use disclosure using a symbolic interactionist approach	Mixed Methods	The Netherlands & Belgium	200 (gbMSM n = 197; non-male n = 3) Only interviews included as all participants were gbMSM n = 32	Belgium cohort: median = 37 Netherlands cohort: median = 45	Self-reported	5
Rice et al. (2019)	Examine perceptions of PrEP access	Qualitative	USA	44 (various identities – on/ eligible for PrEP)	Not specified— overall sample M = 32 but not all gbMSM; all 18+	Self-reported	5
Rogers et al. (2019)	Learn about young, black, gbMSM's views of PrEP	Qualitative	USA	29	19–35; M = 25.1; SD = 4	Self-reported	5
Schwartz and Grimm (2019)	Examine the experience of gbMSM using PrEP, focusing on communication with HCPs and social networks	Qualitative	USA	38	M = 35	Self-reported	5
Stephenson et al. (2022)	Understand PrEP use dynamics among male couples	Quantitative descriptive study	USA	750	18–24 (15.2%) 25–34 (59.8%) 35–44 (19.1%) 45+ (6%)	5-item PrEP Stigma scale (Fortenberry et al., 2002)	3
Storholm et al. (2017)	Examine adherence to PrEP and sexual behaviors among substance using gbMSM	Qualitative	USA	30	20–35; M = 27.5; SD = 3.9	Self-reported	5

(*Continued*)

Table 1. (Continued).

Authors (Year)	Aim	Study Design	Country	Sample Size (n)	Age (years)	Measure of Stigma	MMAT
Sullivan and Eaton (2021)	Examine psychosocial factors associated with PrEP uptake in black gbMSM	Quantitative descriptive study	USA	293	M = 31.1; SD = 9.6	Stigma items adapted from Wilson & Yoshikwa (2007) and LaVeist (2013) – focus on stigma around race, sexual orientation, from HCPs, and medical mistrust	4
C. J. Sun et al. (2019)	Explore the psychosocial and sociocultural dimensions of PrEP use	Qualitative	USA	23 (gbMSM n = 14; other LGBTQ n = 9)	Overall sample: 21–67; M = 39.9; SD = 10.61 (gbMSM only not provided)	Self-reported	5
S. Sun et al. (2021)	Investigate PrEP willingness, adherence self-efficacy and potential impact of PrEP	Quantitative descriptive study	China	622	18–62; M = 29.75; median = 28; SD = 8.32	Concerns of PrEP use- some stigma	5
Tangmunkongvorakul et al. (2013)	Better understand characteristics of iPrEx participants and gain insight into experiences taking PrEP	Qualitative	Thailand	46 (gbMSM n = 29; trans women n = 17)	Overall sample: 19–37	Self-reported	5
Thomann et al. 2018)	Assess responses to a social media campaign focusing on PrEP use	Qualitative	USA	24 (gbMSM n = 22; trans women n = 2)	21–50	Self-reported	5
Vaccher et al. (2018)	Gather data on PrEP adherence	Qualitative	Australia	24	18–53; median = 38	Self-reported	5
Williamson et al. (2019)	Examine views, experiences, representations and intentions regarding PrEP	Qualitative	UK	18	24–48	Self-reported	5
Witzel et al. (2019)	Understand motivations and barriers to PrEP uptake among Black gbMSM	Qualitative	UK	25	18–45; M = 31.1 9918–25 (32%) 26–35 (40%) 36–45 (28%)	Self-reported	5
Wong et al. (2019)	Understand local perspectives on potential barriers and motivators to PrEP adoption prior to implementation of PrEP services	Qualitative	Singapore	33	21–30 (51.52%) 31–40 (42.42%) 40+ (6.06%)	Self-reported	5
Zapata et al. (2022)	Investigate the relationship between social support and PrEP-related care	Qualitative	USA	20	22–70; M = 33; SD = 10.48	Self-reported	5

NPTs = new prevention technologies.

Narrative synthesis

Just two studies explicitly reported prevalence of PrEP stigma, with quite different estimates of 10% (Rogers et al., 2019) and 45.2% (Quinn et al., 2020) of gbMSM samples. A further two studies noted that the majority of their samples were aware of stigmatizing attitudes and behaviors toward PrEP and PrEP users (Franks et al., 2018; Virendrakumar et al., 2021).

PrEP stigma was characterized by several stereotypes (see Table 2), including assumptions that (i) PrEP users are more likely to engage in behaviors deemed *"higher risk"* (n = 32), (ii) PrEP users are HIV positive (n = 29), (iii) PrEP users are more promiscuous than non-PrEP users (n = 28), and (iv) PrEP is only for gbMSM (n = 15).

Six sources of experienced and anticipated stigma related to PrEP were identified. From most to least commonly reported, these were (i) healthcare professionals (HCPs; n = 25), (ii) partners (n = 18), (iii) other gbMSM (n = 16), (iv) friends and acquaintances (n = 14), (v) family (n = 14), and (vi) self-stigma (n = 7) (see Table 3).

The stigma associated with PrEP use was reported to affect various aspects of gbMSM's lives. Most commonly, stigma was reported to affect relationships (n = 17), the decision to disclose PrEP use (n = 15), health behaviors (n = 10), and mental health (n = 6; see Table 4).

Table 2. Overview of PrEP user stereotypes reported.

Stereotypes	Studies Reporting This
High-Risk Behaviors (*n*=32)	Alcantar Heredia and Goldklank (2021), Alt et al. (2022), Bistoquet et al. (2021), Bosco et al. (2021), Bourne et al. (2017), Brooks, Landrian, et al. (2019), Brooks, Nieto, et al. (2019), Brooks et al. (2020), Collins et al. (2017), Devarajan et al. (2020), Dubov et al. (2018), Elopre et al. (2018), Franks et al. (2018), Golub et al. (2017), Gómez et al. (2022,) Grace et al. (2018), Jaspal and Daramilas (2016), Klassen et al. (2017), J. J. Lee et al. (2022), Lin et al. (2022), Magno et al. (2019), Newman et al. (2018), Nguyen et al. (2021), Pantalone et al. (2020), Puppo et al. (2020), Reyniers et al. (2021), Schwartz and Grimm (2019), Storholm et al. (2017), S. Sun et al. (2021), Tangmunkongvorakul et al. (2013), Witzel et al. (2019), Zapata et al. (2022)
HIV+ (*n*=29)	Bartels et al. (2021), Brooks, Landrian, et al. (2019), Brooks, Nieto, et al. (2019), Brooks et al. (2020), Chakrapani et al. (2015), Chemnasiri et al. (2020), Dubov et al. (2018), Elopre et al. (2018), Franks et al. (2018), Golub et al. (2017), García et al. (2017), Grace et al. (2018), Huang et al. (2019), Karuga et al. (2016), Kimani et al. (2021), Lau et al. (2022); Lin et al. (2022), Magno et al. (2019), Mimiaga et al. (2014), Owens et al. (2020), Philbin et al. (2016), Puppo et al. (2020), Quinn et al. (2020), Reyniers et al. (2021), Schwartz and Grimm (2019), C. J. Sun et al. (2019), S. Sun et al. (2021), Tangmunkongvorakul et al. (2013), Vaccher et al. (2018)
Promiscuity (*n*=28)	Alcantar Heredia and Goldklank (2021), Bartels et al. (2021), Bosco et al. (2021), Brooks, Landrian, et al. (2019), Brooks, Nieto, et al. (2019), Brooks et al. (2020), Chakrapani et al. (2015), Collins et al. (2017), Dubov et al. (2018), Elopre et al. (2018), Golub et al. (2017), Harkness et al. (2021), Hubach et al. (2017), Jaspal and Daramilas (2016), Klassen et al. (2017), J. J. Lee et al. (2022), Lin et al. (2022), Magno et al. (2019), Newman et al. (2018), Puppo et al. (2020), Quinn et al. (2020), Remy et al. (2020), Schwartz and Grimm (2019), C. J. Sun et al. (2019), Thomann et al. (2018), Williamson et al. (2019), Wong et al. (2019), Zapata et al. (2022)
gbMSM only (*n*=15)	Alt et al. (2022), Brooks et al. (2020), Chakrapani et al. (2015), García et al. (2017), Golub et al. (2017), Harkness et al. (2021), Jaramillo et al. (2022), Mpunga et al. (2021), Philbin et al. (2016), Rice et al. (2019), Rogers et al. (2019), C. J. Sun et al. (2019), Thomann et al. (2018), Wong et al. (2019), Zapata et al. (2022)

Table 3. Sources of PrEP stigma.

Source of PrEP Stigma	Studies Reporting This
Healthcare Professionals (HCPs; *n*=25)	Alt et al. (2022), Baruch et al. (2020), Bistoquet et al. (2021), Bosco et al. (2021), Brooks, Landrian, et al. (2019), Brooks et al. (2020), Collins et al. (2017), Devarajan et al. (2020), García et al. (2017), Grace et al. (2018), Harkness et al. (2021), Hubach et al. (2017), Jaramillo et al. (2022), Lau et al. (2022), Magno et al. (2019), Maloney et al. (2017), Newman et al. (2018), Owens et al. (2020), Refugio et al. (2019), Remy et al. (2020), Rice et al. (2019), Schwartz and Grimm (2019), C. J. Sun et al. (2019), Thomann et al. (2018), Zapata et al. (2022)
Partners (*n*=18)	Alcantar Heredia and Goldklank (2021), Arnold et al. (2017), Bartels et al. (2021), Brooks et al. (2020), Brooks, Landrian, et al. (2019), Chakrapani et al. (2015), Chemnasiri et al. (2020), Dubov et al. (2018), Elopre et al. (2018), Mimiaga et al. (2014), Puppo et al. (2020), Quinn et al. (2020), Reyniers et al. (2021), Stephenson et al. (2022), Tangmunkongvorakul et al. (2013), Thomann et al. (2018), Vaccher et al. (2018), Zapata et al. (2022)
Other gbMSM (*n*=16)	Bistoquet et al. (2021), Brooks, Landrian, et al. (2019), Brooks, Nieto, et al. (2019), Collins et al. (2017), Dubov et al. (2018), Gómez et al. (2022), Grace et al. (2018), Lin et al. (2022), Newman et al. (2018), Puppo et al. (2020), Quinn et al. (2020), Refugio et al. (2019), Reyniers et al. (2021), Schwartz and Grimm (2019), C. J. Sun et al. (2019), Zapata et al. (2022)
Friends/Acquaintances (*n*=14)	Brooks, Landrian, et al. (2019), Chemnasiri et al. (2020), Dubov et al. (2018), Elopre et al. (2018), Gómez et al. (2022), Grace et al. (2018), Hubach et al. (2017), Newman et al. (2018), Nguyen et al. (2021), Quinn et al. (2020), Refugio et al. (2019), Reyniers et al. (2021), Rice et al. (2019), Tangmunkongvorakul et al. (2013)
Family (*n*=14)	Arnold et al. (2017), Bistoquet et al. (2021), Brooks et al. (2020), Brooks, Landrian, et al. (2019), Chakrapani et al. (2015), Grace et al. (2018), Jaspal and Daramilas (2016), Magno et al. (2019), Nguyen et al. (2021), Quinn et al. (2020), Refugio et al. (2019), Reyniers et al. (2021), Rice et al. (2019), Tangmunkongvorakul et al. (2013)
Self-Stigma (*n*=7)	Brooks, Landrian, et al. (2019), Collins et al. (2017), Dubov et al. (2018), Jaspal and Daramilas (2016), Newman et al. (2018), C. J. Sun et al. (2019), Vaccher et al. (2018)

Table 4. Implications of PrEP stigma.

Implication	Studies finding an effect
Relationships (*n*=17)	Alcantar Heredia and Goldklank (2021), Arnold et al. (2017), Bartels et al. (2021), Bosco et al. (2021), Brooks et al. (2020), Brooks, Landrian, et al. (2019), Chakrapani et al. (2015), Dubov et al. (2018), Grace et al. (2018), Mimiaga et al. (2014), Puppo et al. (2020), Quinn et al. (2020), Reyniers et al. (2021), Stephenson et al. (2022), Tangmunkongvorakul et al. (2013), Thomann et al. (2018), Zapata et al. (2022)
PrEP Disclosure (*n*=15)	Bartels et al. (2021), Brooks, Landrian, et al. (2019), Chakrapani et al. (2015), Franks et al. (2018), Grace et al. (2018), Huang et al. (2019), Karuga et al. (2016), Magno et al. (2019), Mimiaga et al. (2014), Newman et al. (2018), Puppo et al. (2020), Remy et al. (2020), Sarita et al. (2017), Vaccher et al. (2018), Zapata et al. (2022)
Health Behaviors (*n*=10)	Alt et al. (2022), Brooks et al. (2020), Collins et al. (2017), S. Lee et al. (2019), Newman et al. (2018), Nguyen et al. (2021), Remy et al. (2020), Rice et al. (2019), Tangmunkongvorakul et al. (2013), Vaccher et al. (2018)
Mental Health (*n*=6)	Dubov et al. (2018), Grace et al. (2018), Puppo et al. (2020), Reyniers et al. (2021), Rice et al. (2019), Schwartz and Grimm (2019)

Table 5. Factors associated with PrEP stigma.

Theme/Factor	Studies finding an effect
Healthcare (*n*=25)	Alt et al. (2022), Baruch et al. (2020), Brooks, Landrian, et al. (2019), Brooks et al. (2020), Collins et al. (2017), Hubach et al. (2017), Jackson et al. (2012), Jaiswal et al. (2018), Karuga et al. (2016), Lau et al. (2022), Magno et al. (2019), Maksut et al. (2018), Meyers et al. (2021), Mpunga et al. (2021), Newman et al. (2018), Owens et al. (2020), Puppo et al. (2020), Remy et al. (2020), Rice et al. (2019), Schwartz and Grimm (2019), Stephenson et al. (2022), Sullivan and Eaton (2021), S. Sun et al. (2021), Thomann et al. (2018), Zapata et al. (2022)
Culture and Context (*n*=24)	Arnold et al. (2017), Bartels et al. (2021), Baruch et al. (2020), Bourne et al. (2017), Brooks et al. (2020), Elopre et al. (2018), Golub et al. (2017), Hubach et al. (2017), Jaspal and Daramilas (2016), Lau et al. (2022), J. J. Lee et al. (2022), Magno et al. (2019), Maloney et al. (2017), Owens et al. (2020), Puppo et al. (2020), Quinn et al. (2020), Reyniers et al. (2021), Rice et al. (2019), Rogers et al. (2019), Schwartz and Grimm (2019), Thomann et al. (2018), Witzel et al. (2019), Wong et al. (2019), Zapata et al. (2022)
Sociodemographic (*n*=22)	Alt et al. (2022), Bartels et al. (2021), Bosco et al. (2021), Brooks, Landrian, et al. (2019), Chakrapani et al. (2015), Dubov et al. (2018), Elopre et al. (2018), Garcia and Saw (2019), García et al. (2017), Golub et al. (2017), Gómez et al. (2022), Harkness et al. (2021), Jaiswal et al. (2018), Jaramillo et al. (2022), Karuga et al. (2016), Klein and Washington (2020), Lau et al. (2022), Magno et al. (2019), Philbin et al. (2016), Rice et al. (2019), Rogers et al. (2019), Zapata et al. (2022)
Peer Discussion (*n*=13)	Bartels et al. (2021), Bistoquet et al. (2021), Gómez et al. (2022), Newman et al. (2018), Nguyen et al. (2021), Puppo et al. (2020), Quinn et al. (2020), Remy et al. (2020), Reyniers et al. (2021), Schwartz and Grimm (2019), Storholm et al. (2017), C. J. Sun et al. (2019), Wong et al. (2019)
Psychosocial (*n*=12)	Alcantar Heredia and Goldklank (2021), Bartels et al. (2021), Bosco et al. (2021), Brooks, Nieto, et al. (2019), Driver et al. (2021), Elopre et al. (2018), Grace et al. (2018), Meyers et al. (2021), Owens et al. (2020), Stephenson et al. (2022), Thomann et al. (2018), Zapata et al. (2022)

Various factors were found to be associated with PrEP-related stigma. These factors were organized under five general categories, which were as follows: healthcare factors (n = 25), culture and context (n = 24), sociodemographics (n = 22), peer discussion (n = 12), and psychosocial factors (n = 12). An overview of the studies reporting these factors can be seen in Table 5, with more information about each factor provided below.

Healthcare factors

Experienced and anticipated stigma varied based on where PrEP was accessible. gbMSM reported mixed views on publicly funded clinics, with some pleased that PrEP was available through these, and others hesitant to seek PrEP from these clinics due to previous experiences of stigma (Kimani et al., 2021; S. Lee et al., 2019). Those considering seeking PrEP anticipated that they would be stigmatized if they accessed this through designated PrEP services, STI clinics, or HIV services (Grace et al., 2018; Kimani et al., 2021; Puppo et al., 2020). Some gbMSM suggested making PrEP available through drop-in centers and in less busy areas to reduce concerns about stigma (Kimani et al., 2021; Maloney et al., 2017).

Differences between HCPs were commonly reported as factors affecting stigma. For example, primary care providers (PCPs) were perceived as less competent at providing PrEP than specialists in two studies (Mpunga et al., 2021; Refugio et al., 2019). Interactions with HCPs who were gay themselves, or who were considered *"gay-friendly"* were frequently reported to be less stigmatizing than interactions with other HCPs (Bistoquet et al., 2021; Grace et al., 2018; S. Lee et al., 2019; Meyers et al., 2021; Mpunga et al., 2021; Ouzzani et al., 2016; Refugio et al., 2019; Reyniers et al., 2021; Williamson et al., 2019). Gay HCPs were perceived as more understanding, with patients reporting that it was easier to talk to and be honest with them (Bistoquet et al., 2021; Meyers et al., 2021). Some specifically switched to gay-friendly HCPs (Mpunga et al., 2021; Reyniers et al., 2021), and 52.63% of one sample reported that they would only attend gay-friendly HCPs due to previous experiences of stigma (Reyniers et al., 2021).

Some sexual health behaviors were found to be associated with stigma in the studies reviewed. Most commonly, PrEP users who did not use condoms reported facing additional stigma (Bourne et al., 2017; Brooks, Landrian, et al., 2019; Meyers et al., 2021; C. J. Sun et al., 2019). Similarly, non-PrEP users who did not use condoms anticipated that they would face stigma for this if they sought PrEP (Alt et al., 2022; Jackson et al., 2012). Less commonly, those who used condoms in combination with PrEP reported negative reactions due to this (Owens et al., 2020).

Awareness of, and experience with PrEP was examined in a small number of studies, with those who had used PrEP reporting significantly less concerns about discussing sexual activity with HCPs (Huang et al., 2019), as well as lower scores on the adapted PrEP User Stereotypes Scale (Magno et al., 2019). Meanwhile, those unaware of PrEP scored higher on a measure of perceived healthcare discrimination (J. J. Lee et al., 2022). However, due to the small number of papers exploring these issues, as well as the cross-sectional nature of the studies in question, these findings cannot be generalized, and directionality cannot be assumed. It may be the case that those reporting less concerns about discussing sexual activity with HCPs are more likely to use PrEP, regardless of PrEP stigma scores. Separately, a single study explored awareness of, and behaviors related to HIV, and how this relates to PrEP stigma. Surprisingly, in this study, those reporting greater knowledge of HIV were less likely to have recently discussed PrEP with a partner and to feel that their partner would support them if they used PrEP (Rice et al., 2019). However, those reporting a higher perceived risk of HIV acquisition and those reporting having tested for HIV within the past 3 months were more likely to report recently discussing PrEP with a partner and feeling that their partner would support them if they used PrEP (Rice et al., 2019). Despite this, those with a higher perceived risk of HIV acquisition were also less likely to report comfort around discussing PrEP with their partners (Rice et al., 2019). Again, as these findings were specific to one paper, further research on this topic is needed before they can be generalized.

Culture and context

Stigma appeared to vary between countries and culture, as well as over time. While the majority of the included studies focused on gbMSM from the USA, 19 other countries were included. However, as many of these countries were represented by only one or two studies, it is not possible to make definite statements about how stigma may differ across these contexts. In addition, these findings are likely biased due to the fact that only studies published in English were included. Further reviews of research published in other languages may reveal differences in PrEP stigma across different cultural contexts.

One major difference found between countries in the studies reviewed was that sex between men was criminalized in some countries, adding an additional layer of stigma around seeking PrEP as a gbMSM (Baruch et al., 2020; Vaccher et al., 2018). While gbMSM from certain cultures in South Asian and Central American countries noted that stigma was higher within these cultures, these statements came from a handful of individuals and may not reflect the wider experiences of gbMSM within these cultures (Bartels et al., 2021; Jaspal & Daramilas 2016; J. J. Lee et al., 2022)

Variations in stigma were also reported within countries. While higher levels of stigma were reported in certain cities such as New York in one study (Franks et al., 2018), the southern USA was reported as an area in which stigma was higher in a number of studies. Specifically, gbMSM from the Southern USA reported that the religious culture of this area amplified stigma related to PrEP (Devarajan et al., 2020; Hong et al., 2018; Refugio et al., 2019; Thomann et al., 2018). The idea of HIV as a *"punishment from God"* was discussed in both Central American countries (Alcantar Heredia & Goldklank, 2021; Klein & Washington, 2020), as well as within the southern USA (Hong et al., 2018) often leading to PrEP stigma, due to the association with HIV.

Some living in the southern USA also cited living in a rural area as a contributor to stigma, noting that there are less HCPs in these locations than in bigger cities, and that the HCPs in rural areas were perceived as less accepting of PrEP and gbMSM (Devarajan et al., 2020; Grace et al., 2018; Mpunga et al., 2021). Often, gbMSM reported either having to stay with these HCPs- in some cases attempting to educate them (Reyniers et al., 2021) or having to travel long distances to access care from less stigmatizing HCPs (Bistoquet et al., 2021; Grace et al., 2018; Mpunga et al., 2021; Williamson et al., 2019). Additionally, privacy was cited as an issue within smaller, rural towns, with gbMSM reporting concern about rumors being spread about PrEP users in these towns (Lin et al., 2022; Mpunga et al., 2021; Remy et al., 2020).

As well as differences by location, time also appeared to affect experiences of PrEP stigma, with some studies reporting many felt that PrEP stigma had decreased over time, and would continue to decrease (Alt et al., 2022; Owens et al., 2020; Pantalone et al., 2020; Quinn et al., 2020; C. J. Sun et al., 2019).

Similarly, some PrEP users reported feeling less affected by stigma the longer they had been on PrEP. In two studies, gbMSM anticipated increased stigma around PrEP as awareness grew (Alcantar Heredia & Goldklank, 2021; Klein & Washington, 2020).

Sociodemographic factors

Stigma was associated with a range of sociodemographic factors in the studies reviewed, suggesting that experiences differ for different groups of gbMSM. One group that appeared to face additional stigma was *"closeted"* men- those who are not openly gay or bisexual. This cohort reported concern that if others knew that they took PrEP, they would also know that they are gbMSM and stigmatize them (Alcantar Heredia & Goldklank, 2021; Bourne et al., 2017; S. Lee et al., 2019; Sarita et al., 2017). This concern was especially prevalent among bisexual men (Alcantar Heredia & Goldklank, 2021), while gbMSM identifying as *"exclusively homosexual"* reported significantly less concern about being asked why they take PrEP (Huang et al., 2019).

Experiences of stigma also differed by race and ethnicity in the studies reviewed, with most studies here finding that non-White gbMSM experienced more stigma than their White counterparts, as well as additional barriers to PrEP (Bartels et al., 2021; Devarajan et al., 2020; Hubach et al., 2017; Nguyen et al., 2021; Refugio et al., 2019; Remy et al., 2020). This was particularly common for Black gbMSM (Devarajan et al., 2020; Hubach et al., 2017; Nguyen et al., 2021; Refugio et al., 2019; Remy et al., 2020) but was also an issue for Hispanic gbMSM (Bartels et al., 2021).

For example, in one study, Black gbMSM reported feeling stereotyped by PrEP campaigns targeted at them, perceiving these as suggesting that HIV only affected Black gbMSM, or blaming them for HIV (Remy et al., 2020). Another study found that Black men often associated being HIV+ with being gay, and treated those seeking PrEP *"differently"* due to the misconception that PrEP users are HIV positive (Nguyen et al., 2021).

The type of stigma discussed also varied by race in two studies (Franks et al., 2018; Huang et al., 2019), with one finding that Black and Latino gbMSM were significantly more likely than White gbMSM to discuss HIV-related stereotypes, but significantly less likely to discuss promiscuity stereotypes (Franks et al., 2018).

Age was associated with stigma in some of the papers reviewed, with older individuals- particularly older gbMSM- reported as a source of PrEP stigma in three studies (Collins et al., 2017; García et al., 2017; Williamson et al., 2019), while younger gbMSM were perceived to be less stigmatizing toward PrEP use (Collins et al., 2017; García et al., 2017). Separately, younger gbMSM reportied significantly higher perceived PrEP stigma scores in one study (Karuga et al., 2016), indicating that, while this cohort may be more accepting of PrEP and those who use it, they may experience

higher instances of stigma. As this is a single study, these findings may not be generalizable; further studies exploring differences in perceived PrEP stigma by age ranges would be merited.

gbMSM of various ages speculated that generational differences may be partially related to the fact that many older people had directly experienced the height of the AIDS crisis, often losing loved ones and possibly being more fearful of HIV as a result (Bourne et al., 2017; Collins et al., 2017; García et al., 2017; Williamson et al., 2019). The contrast between HIV prevention methods between now and then was suggested as another reason for resistance to PrEP among older gbMSM (Bourne et al., 2017; Collins et al., 2017; García et al., 2017). Age was related to the type of stigma gbMSM reported concern about, with one study finding that those aged 50 or older were more likely to mention HIV-related stereotypes (Franks et al., 2018), while another found that younger PrEP users were more likely to report concern about assumptions that they had multiple partners, engaged in "strange" sex, did not use condoms, or were "bottoms," as well as concerns that health insurance premiums would increase (Karuga et al., 2016).

A handful of studies explored socio-economic factors, with one finding that those earning over $15,000 per year reported less concern about PrEP stigma (Huang et al., 2019). However, the authors also found that concern about certain items specifically increased by income. These were as follows: others assuming that PrEP users are HIV positive, others questioning why one is taking PrEP, and discussing sex life with HCPs (Huang et al., 2019). In another study, those earning over $20,000 per year were more likely to discuss PrEP stigma related to promiscuity (Franks et al., 2018). Meanwhile, those with higher levels of education were more likely to report concern about promiscuity stereotypes (Elopre et al., 2018; Franks et al., 2018), while those with lower education levels were more likely to mention HIV-based stereotypes (Franks et al., 2018).

Much like the findings relating to cultural differences, these findings should be interpreted with caution, as in some cases- particularly relating to socio-economic differences, a limited number of studies examined this factor. Further research on PrEP stigma and its associates should aim to recruit diverse samples and compare stigma levels across a range of sociodemographic factors.

Peer discussion

Some of the studies reviewed suggest that one way to address PrEP stigma could be through informal discussions between PrEP users and non-PrEP users. Often, these conversations took place in social settings, with influential figures within communities acting as role models by sharing their experiences, addressing misconceptions, and encouraging others to consider PrEP (García et al., 2017; Pantalone et al., 2020). Those who had not had these conversations reported that they would fear stigma less if they knew someone taking PrEP (Mimiaga et al., 2014).

Psychosocial factors

Just under one-quarter of the included studies examined the relationship between psychosocial factors and PrEP stigma. Those exploring relationship factors primarily compared differing relationship dynamics. For example, while in one study, being in a non-monogamous relationship was found to be a source of stigma, (Bosco et al., 2021), three other studies found that discussing PrEP within monogamous relationships was reported to be especially challenging (Bartels et al., 2021; Mimiaga et al., 2014; C. J. Sun et al., 2019). Similarly, those with more partners were more likely to report comfort with discussing PrEP with a partner and perceiving that their partners would support their PrEP use (Rice et al., 2019). However, those in non-monogamous relationships also faced unique challenges, with some choosing not to disclose their PrEP use in order to avoid revealing that their relationships are non-monogamous, due to anticipated stigma related to this (Garcia & Saw, 2019; Virendrakumar et al., 2021; Williamson et al., 2019). One study comparing relationships in which individuals had either (i) agreed on a monogamous relationship, (ii) agreed on a non-monogamous relationship, or (iii) had not discussed or agreed upon the relationship dynamic, found that those in the first two groups were significantly more likely to report feeling comfortable to discussing PrEP with a partner and perceiving that their partner would support them if they used PrEP use (Rice et al., 2019).

gbMSM in relationships with differing HIV statuses were more likely than those in relationships in which partners had the same HIV status to report that their partner would support them if they took PrEP, although they also reported significantly lower levels of comfort about discussing PrEP with a partner (Rice et al., 2019). In some cases, PrEP users with partners who were HIV positive chose not to be open about their PrEP use in order to avoid revealing their partner's status and potentially exposing them to HIV stigma (Alcantar Heredia & Goldklank, 2021).

One study assessing psychological measures and substance abuse within relationships found that participants were less likely to report feeling comfortable discussing PrEP with a partner if they reported recent binge drinking, substance use, internalized homophobia (Stephenson et al., 2022) Additionally, participants were less likely to report that their partner would support them using PrEP if they reported higher recent depressive symptoms, or if their partners reported recent substance use or higher internalized homophobia (Stephenson et al., 2022).

Psychological measures were also explored on an individual level in a handful of studies, with one study finding that those reporting higher levels of internalized homophobia were significantly more likely to start PrEP (Magno et al., 2019). Another study (Chemnasiri et al., 2020) found significant positive relationships between avoidance of femininity and anticipated PrEP stigma, as well as between heterosexual self-preservation and PrEP stigma.

This study also found that heterosexual self-preservation was associated with increased interest in PrEP, while those reporting higher levels of avoidance of feminity reported lower interest in PrEP (Chemnasiri et al., 2020). In both cases, these relationships were qualified by an interaction with anticipated PrEP stigma, suggesting that these associations are also dependent on levels of PrEP stigma (Chemnasiri et al., 2020). Given the lack of attention paid to these issues in the literature, further studies should explore how PrEP stigma may indirectly affect other psychological factors, and subsequently PrEP uptake.

Few studies touched on the role of social support, although one study found that PrEP users usually disclosed their PrEP use to those they had a strong connection to, and those who did not report close relationships were less likely to disclose their PrEP use to their friends and family (Alcantar Heredia & Goldklank, 2021). Those who were not open about their gbMSM identities or PrEP use often reported lacking a supportive community (Devarajan et al., 2020).

While the findings of a small number of studies suggest that psychosocial factors may be linked to PrEP stigma, it should be acknowledged that less than 20% of the included studies examined these factors. Additionally, the majority of the findings regarding relationship factors came from a single study (Rice et al., 2019). It is evident that a more thorough investigation into the relationship between psychosocial factors and PrEP stigma is needed.

Discussion

This review provides a valuable insight into the sources of PrEP stigma, as well as the factors associated with increased and decreased levels of stigma in gbMSM. Additionally, findings suggest that stigma associated with PrEP use is complex and shaped by various stereotypes. Identifying ways in which these stereotypes can be tackled is an important consideration when designing interventions to reduce PrEP stigma, thereby increasing the uptake of PrEP.

Consistent with the wider literature, PrEP stigma permeates various aspects of gbMSM's lives, having negative effects on their relationships, health behaviors, decision to disclose PrEP use, and mental wellbeing, highlighting the importance of developing interventions to decrease PrEP stigma (Witzel et al., 2019; Wong et al., 2019).

However, it is notable that less than 10% of the studies explored the impact of PrEP stigma on mental health. One reason for this may be because many psychological measures are quantitative, while the majority of studies included in this review were qualitative in nature. Given that stigma has been shown to be strongly associated with negative mental health outcomes in people living with HIV (Katz & Nevid, 2005; Vanable et al., 2006), the role of psychological factors in stigma merits an in-depth investigation.

While stigma emerged from multiple sources, the most frequently reported source of perceived and enacted stigma was HCPs, suggesting a clear need for

HCPs to create a supportive and non-judgmental environment for PrEP users and those seeking PrEP. Similarly, over one-third of studies reported that healthcare factors- such as the clinic PrEP was available in, as well as HCP characteristics- were associated with PrEP stigma. Often, attending STI clinics to access PrEP led to anticipated stigma, in addition to acting as a barrier to many gbMSM. As Calabrese suggests, it may be beneficial to make PrEP available in wider settings such as primary care centers in order to reduce anticipated stigma and increase uptake (Calabrese, 2020). It is clear that HCPs could also benefit from training to familiarize themselves with PrEP and caring for gbMSM patients.

Interestingly, this review found no interventions specifically targeted at reducing PrEP stigma, however our findings suggest this should be an important consideration for future research. The importance of developing interventions to address PrEP stigma is apparent when considering the impacts discussed above. By addressing the stigma surrounding PrEP, barriers to seeking health care could be mitigated in order to increase positive health behaviors, including PrEP uptake and adherence among gbMSM, which is especially important given that this cohort is disproportionately affected by HIV.

A key factor to take into account when designing interventions is the finding that education about PrEP frequently came from informal, peer-discussions between PrEP users and non-PrEP users. These conversations were reported to challenge stigma by dispelling myths and offering a space to ask questions. It may be beneficial for stakeholders to collaborate with key community figures when attempting to promote PrEP.

A strength of the review was that the studies came from 20 different countries, spanning five continents. Experiences of stigma varied by location, with over a quarter of studies reporting geographical and cultural differences in stigma. The results suggest that when attempting to reduce PrEP stigma, it is important to acknowledge the cultural context, and consider that interventions developed in one country may not be applicable globally. In addition, stigma varied based on a range of sociodemographic factors, suggesting that certain groups of gbMSM are more at risk of facing stigma when taking or seeking PrEP compared to others.

This review also highlights a key gap in the literature, which is the lack of research into the role of psychological factors on experiences of PrEP stigma. Only five studies explored this topic, and other research in this area is limited (Hammack et al., 2018; Rosengren et al., 2021). Further research should investigate this in more depth by analyzing relationships between psychosocial measures and experiences of PrEP stigma. As well as continued research on gbMSM's experiences of PrEP stigma, this should also be investigated in other populations, as findings may not be generalizable to all PrEP users.

Limitations

Despite covering a range of countries, over half of the studies reviewed came from the USA. In addition, only studies published in English were included, meaning that findings are biased toward a Western-centric sample and may not be generalizable to other contexts. While several studies exploring the experience of stigma were reviewed, most did not use validated measures of this, partly because validated scales specifically measuring PrEP stigma were only recently developed (Klein & Washington, 2019). Additionally, most studies were also cross-sectional, meaning that the directionality of relationships between stigma and its associates cannot be known. Similarly for certain factors, the number of studies investigating the impact of these was limited which limits the generalizability of certain findings.

Conclusion

Our findings offer a deeper understanding of the nature and consequences of PrEP stigma in gbMSM. We also note several gaps in the literature to be addressed by further research. Importantly, the findings highlight the need for stigma to be addressed in order to improve PrEP uptake and overall health seeking behaviors among gbMSM, which will ultimately reduce likelihood of HIV acquisition. By understanding the factors associated with PrEP stigma, those involved in providing care can begin to identify ways of reducing such stigma and barriers to care.

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