Interventions, Barriers, and Facilitators to Address the Sexual Problems of Gay, Bisexual and Other Men Who Have Sex with Men Living with HIV: A Rapid Scoping Review

ABSTRACT

Sexual problems are common among gay, bisexual, and other men who have sex with men (GBM) after diagnosis with HIV. However, these are often overlooked in care and research, where sexual risk reduction and biomedical aspects of sexual health tend to dominate. We conducted a rapid scoping review to investigate which sexual problems of GBM living with HIV are addressed by interventions, and the barriers and facilitators to their implementation. Literature from high-income countries published in English since 2010 was reviewed. Medline, Embase, PsycInfo, and Scopus databases were searched on July 4, 2022. Targeted sexual problems were categorized according to the ten dimensions of Robinson's Sexual Health Model, and barriers and facilitators, according to the five domains of the Consolidated Framework for Implementation Research (CFIR). Interventions focused solely on the dimension of Sexual Health Care/Safer Sex were excluded. Relevant information was extracted from the qualifying documents with NVivo 12 software for content analysis. Fifty-two documents were included, referring to 37 interventions which mainly took place in the United States (*n*=29/37; 78%), were group-based (*n*=16; 41%), and used counselling techniques (*n*=23; 62%; e.g., motivational interviewing, cognitive-behavioral therapy). Their settings were mostly primary care (*n*=15; 40%) or community-based (*n*=16; 43%). On average, interventions addressed 3 sexual health dimensions (*SD* = 2; range: 1-10). The most targeted dimension was Sexual Health Care/Safer Sex (*n*=26; 70%), which concerned sexual risk reduction. Next, Challenges (*n*=23; 62%), included substance use (*n*=7; 19%), sexual

compulsivity (*n*=6; 16%), sexual abuse (*n*=6; 16%), and intimate partner violence (*n*=4; 11%). Third was Talking About Sex (*n*=22; 59%) which mostly concerned HIV disclosure. About a third of interventions addressed Culture/Sexual identity (*n*=14; 38%), Intimacy/Relationships (*n*=12; 33%), and Positive sexuality (*n*=11; 30%). Finally, few targeted Body Image (*n*=4; 11%), Spirituality (*n*=3; 8%), Sexual Functioning (*n*=2; 5%) or Masturbation/Fantasy (*n*=1; 3%). Forty-one documents (79%) mentioned implementation barriers or facilitators, particularly about the characteristics of the interventions (41% and 78%, respectively; e.g., cost, excessive duration, acceptability, feasibility) and of the individuals involved (37% and 46%; e.g., perceived stigmatization, provider expertise). The other three CFIR dimensions were less common (5%–17%). The search strategy of this review may not have captured all eligible documents, due to its limit to English-language publications. Overall, most interventions incorporated a focus on Sexual Health Care/Safer Sex, at the expenses of other prevalent sexual problems among GBM living with HIV, such as intimate partner violence (Challenges), erectile dysfunction (Sexual Anatomy Functioning), and Body Image dissatisfaction. These findings suggest they could receive more attention within clinical care and at the community level. They also highlight the importance of cost-effective and acceptable interventions conducted in non-stigmatizing environments, where patients' needs can be met by providers who are adequately trained on sexuality-related topics.

KEYWORDS: counseling, homosexuality, LGBT, psychotherapy, queer, sexuality

INTRODUCTION

Sexual problems are prevalent among gay, bisexual, and other men who have sex with men (GBM) living with HIV. For instance, up to 70% of report at least one in the first year after diagnosis [1]. Such problems include avoidance of sex, HIV transmission anxiety, poor self-image, loss of libido, and erectile dysfunction, among others [1-8]. Sexual problems refer to any condition related to sex or sexuality that causes discontent or dissatisfaction from an emotional, physical, or relational point of view [9]. They include but are not limited to issues concerning sexually transmitted infections (STIs) and sexual dysfunction. Despite the diversity of sexual problems faced by GBM with HIV, sexual behavior, risk mitigation, and biomedical aspects of sexual health tend to dominate HIV research and healthcare practice globally, with the continued aims of improving the uptake and options of antiretroviral therapy [10,11]. Importantly, treatment efficacy has advanced such that people with HIV are able to have near-normal lifespans [12]. Furthermore, a standardized, public health approach to care [13] has led to the achievement of global targets for treatment initiation in GBM groups, especially in high-income countries [14]. However, while STI screening and risk reduction counselling are part of routine HIV care in several high-income countries [15], other dimensions of sexual health (e.g., satisfaction, dysfunction, relationships) have received relatively little attention in research and interventions [1,3,16-19].

Unresolved sexual problems among GMB with HIV can negatively affect health-related quality of life and overall wellbeing [20,21], interfere with significant relationships, lead to comorbid mental health problems [22] and sexualized drug use (“chemsex”) intoxication [23], increase sexual risk behavior [4], and impair adherence to antiretroviral therapy [24]. Addressing sexual problems by tailoring interventions to the specific patients’ sexual health

needs can improve their management [25], consistent with a differentiated approach that combines lessons from public health and an individualized, personalized model of care [26].

Treatment strategies and guidelines to address the sexual problems of GBM living with HIV are available [27]. However, addressing these issues can be challenging [3]. For instance, among GBM irrespective of HIV status, factors such as discrimination and perceived stigma associated with sexual minority status can prevent the seeking out or reception of health services [28-31]. Commonly cited barriers among GBM are not having disclosed their sexual orientation [32-34]; medical mistrust [35]; fear of rejection by healthcare providers; failure of physicians to ask about sexual orientation [36]; provider concern about creating embarrassing situations [17,37]; and a lack of clinician sexual health training [38].

Similar barriers apply to HIV care and include clinician reluctance to discuss sexual problems, and time constraints [18,34]. Patients in care may also not be comfortable disclosing sexual behavior or problems, despite wanting to discuss sexual health and considering such discussions relevant to care [17,19,39,40]. However, a provider's easygoing attitude or long-term relationship with the patient may facilitate these discussions [3,39].

Given the apparent prevalence of sexual problems among GBM with HIV, scientific and clinical preoccupation with HIV risk reduction and biomedical issues [10,11,25], and barriers to adequate sexual health care, more knowledge is required to address these issues. The objectives of this rapid scoping review were to: (1) identify and classify the sexual problems of GBM living with HIV which are targeted by interventions in high-income countries; (2) describe the key features of these interventions; and (3) specify the barriers and facilitators reported to impact their implementation.

METHODS

Rapid reviews are useful to accommodate time and resource constraints, while generating useful information in a timely manner [41,42]. Scoping reviews are relevant to synthesize evidence to answer an exploratory research question, with the aim of mapping key concepts, types of evidence, and gaps in research [43,44]. A scoping review was justified by this project's broad research questions, and its conceptual and methodological focus (i.e., on interventions, barriers, facilitators) [45]. Its stages were based on the Joanna Briggs Institute approach for scoping reviews, namely: (1) development of the review questions; (2) definition of eligibility criteria; (3) development and application of a search strategy in several electronic databases; (4) screening of relevant studies; (5) result extraction; (6) and synthesis of the results [45].

This review's search strategy and synthesis of targeted sexual problems were guided by Robinson's Sexual Health Model [46]. This model was chosen as it offers a comprehensive perspective on sexual health and sexual problems and contains 10 dimensions: Talking About Sex; Culture and Sexual Identity; Sexual Anatomy Functioning; Sexual Health Care and Safer Sex; Challenges; Body Image; Masturbation and Fantasy; Positive Sexuality; Intimacy and Relationships; and Spirituality [46]. It has been used to design interventions adapted to different populations [47], including GBM [48] and GBM with HIV [49].

Review Questions

The following review questions were addressed: (1) Which sexual problems of GBM living with HIV are the targets of interventions in Organization for Economic Co-operation and Development (OECD) countries? (2) With which type of interventions are they addressed? (3) What factors are reported to affect intervention implementation?

Inclusion and Exclusion Criteria

Publication Characteristics. Varied publication types were eligible for inclusion, such as primary empirical studies (whether qualitative, quantitative, and/or mixed methods), theses (grey literature), literature reviews, and commentaries. Conference abstracts and intervention protocols were followed up for associated eligible publications but not themselves included. Multiple records referring to a same intervention were retained. If there was ambiguity or lack of clarity about the targets and characteristics of the interventions, we contacted the authors for further information. We retained only documents in English, and the references of retained documents were scanned.

Population. The population of interest was GBM living with HIV in any of the 38 OECD countries, irrespective of age. According to the World Bank classification, the OECD groups 34 high-income countries and 4 upper-middle-income countries [50]. The acronym "GBM" allows for the inclusion of an identity-based dimension of sexual orientation (i.e., gay, bisexual), to the behavioral category of "men who have sex with men" which can include men who engage in same-sex behavior, but might not identify as gay or bisexual [51]. If study samples included multiple populations, information specific to GBM living with HIV was required for retention.

Intervention. Documents had to focus on interventions to address the sexual problems of GBM living with HIV. An intervention is "a treatment, procedure, or other action taken to prevent or treat disease, or improve health in other ways" [52]. Eligible interventions included sex therapy, sex education, efforts to improve patient-provider communication, counselling, screening, and pharmacological treatment, among others. As biomedical issues were not the focus of this review, Sexual Health Care/Safer Sex interventions had to target at least one other dimension of the Sexual Health Model to be included. Hence, we excluded interventions solely focused on STIs, behavioral risk and risk reduction, safer sex, partner

notification of an STI, treatment adherence, or HIV prevention. Both healthcare and community-based settings of intervention implementation were considered.

Comparison. Research with and without a comparator was eligible for inclusion.

Outcomes. Barriers and facilitators were defined as any factor reported by authors as impacting the intervention's implementation in addressing its targeted sexual problems.

Timeframe. Documents published from 2010 to present were included, a period which saw relevant changes to sexual cultures in high-income countries, both in terms of new technologies, such as dating apps, and biomedical innovations (e.g., pre-exposure prophylaxis (PrEP)), and during which GBM continued to account for a considerable proportion of HIV prevalence and incidence [53-55]. Progress during the past decade in HIV treatment has improved the life expectancy and quality of life of people living with HIV [12], who can take antiretroviral therapy to reduce the risk of sexual transmission of HIV, a strategy known as "treatment as prevention" [56]; current evidence indicates that people living with HIV cannot transmit the virus if their viral load is undetectable [57,58]. Moreover, both daily and on-demand PrEP is highly effective in preventing HIV transmission in people at-risk of HIV acquisition [59,60]. The consequent wide range of prevention options may have reduced both fears of transmission and HIV stigma, as well as increased agency and empowerment towards improved sexual health [61]. The 2010 to date timeframe therefore ensure results are applicable to the current sexual health context for this population.

Search Strategy

Two academic librarians contributed to develop a comprehensive search strategy. Four databases were searched on 4th July 2022: Medline, Embase, Scopus, and PsycInfo. Four main concepts guided the search strategy: sexual problems (e.g., satisfaction, functioning, relationships, body image), GBM, HIV, and interventions. The "sexual problems" concept

was informed by the Sexual Health Model. Search terms relating to STIs, risk or sexual behavior were not used as these were not the focus of this review. Table 1 shows the search conducted in PsycInfo. The searches performed in the other databases are available from the corresponding author upon request.

Screening

Screening was done in two stages. First, the first author (FA) imported all the records identified into EndNote 20, eliminated the duplicates, and screened all titles and abstracts. Another author (KE) independently screened 20% of the records. Any disagreement was resolved through discussion and consensus. Secondly, the full texts of records deemed eligible were reviewed, with KE performing a dual review of 20%. Percent agreement between the two reviewers was calculated, as well as interrater reliability according to Cohen's Kappa [62].

Critical Appraisal

Consistent with scoping review guidelines, critical appraisal of the included documents was not performed [45].

Data Charting and Analysis

Data on the type of sexual problems addressed as well as the associated interventions, barriers, facilitators and publication details were extracted and charted in tables by the first author and verified by KE for 20% of included documents. Data were imported into Microsoft Excel© and documented publication details included first author, year of publication, country of publication. Relevant information was extracted directly from the documents with NVivo 12 software to facilitate content analysis, which is useful to synthesize large amount of extracted qualitative data [63]. Analysis proceeded in three phases:

(1) To address Objective 1, we extracted information on the sexual problems addressed by the reported interventions, and categorized them according to the Sexual Health Model [46].

(2) To address Objective 2, we described the characteristics of the interventions used, such as intervention type, targeted sub-population of GBM living with HIV (participants), and the setting of implementation.

(3) To address Objective 3, we categorized reported implementation barriers and facilitators, according to the Consolidated Framework for Implementation Research (CFIR). The CFIR provides an established and pragmatic structure to identify factors affecting the implementation of interventions and is based on five key domains: characteristics of the intervention, outer setting, inner setting, characteristics of the individuals involved, and the process of implementation [64].

RESULTS

The Search

A total of 5688 records were identified. After removing 2654 duplicates, 3034 records were reviewed for abstract screening. We removed 2937 of these and agreement between the two reviewers was fair (96%; Cohen's k = 0.34). Ninety-seven full texts were reviewed and 57 were removed. Agreement at this stage was substantial (84%; Cohen's k = 0.68). Details about the screening process are presented in the PRISMA chart (Figure 1). Fifty-two papers were included in the synthesis: 40 from the database search and 12 from screening the references of retained documents.

Characteristics of the Review Sample

The 52 documents included 36 intervention studies, 10 cross-sectional studies, 3 literature reviews, 1 case-study, and 1 intervention protocol with 1 associated publication. These

documents referred to a total of 37 interventions (Table 2). Most interventions took place in the United States (*n* = 29; 78%). Other represented OECD countries included Canada (*n* = 3), Sweden (*n* = 2), the Netherlands (*n* = 1), and Colombia (*n* = 1). Finally, one study was a European multi-center trial and took place in Belgium, Italy, France, Germany, the Netherlands, Poland, Spain, and England.

Targeted Sexual Health Model Dimensions

Supplemental Table 1 shows the dimensions of the Sexual Health Model addressed by the 37 interventions. On average, they addressed 3 dimensions (*SD* = 2), ranging from 1 to 10. Notably, 2 interventions were based on the Sexual Health Model [49,65], one of which addressed all 10 dimensions [49]. The targeted dimensions are presented in order of frequency. The numbers of interventions reporting each finding are reported in parentheses, out of a possible 37 interventions.

Sexual Health Care and Safer Sex was the most commonly addressed dimension (*n* = 26; 70%), being the target of nearly three-quarters of the interventions. Under this domain, we categorized any intervention aiming to reduce sexual risk behavior (*n* = 21; 57%) or increase condom use (*n* = 8; 22%) and safer sex (*n* = 4; 11%).

Challenges. The Challenges dimension was the second most frequent dimension (*n* = 23; 62%), targeted by almost two-thirds of the interventions. In line with Robinson's (2002) definition, it included issues such as substance abuse (*n* = 7; 19%), sexual abuse (*n* = 7; 19%), sexual compulsivity (*n* = 6; 16%), and intimate partner violence (*n* = 4; 11%).

Talking About Sex. Robinson's (2002) model defines this dimension as the "ability to talk comfortably and explicitly about sexuality, especially one's own sexual values, preferences, attractions, history and behaviors" (Robinson et al., 2002, p. 48). In our sample, Talking About Sex (*n* = 22; 59%) was addressed by over half of the interventions and mostly

concerned HIV disclosure (*n* = 16; 43%) and communication or negotiation with sex partners (*n* = 5; 14%). Nearly all of them were in combination with a focus on Sexual Health Care/Safer Sex (n = 20; 54%).

Culture and Sexual Identity. This dimension includes cultural beliefs and their impact on sexual identity. Over one-third of the interventions in our sample addressed it (*n* =14; 38%), focusing on homophobia and discrimination (*n* = 5; 14%), HIV stigma (*n* = 3; 8%), and minority stress (*n* = 2; 5%).

Intimacy and Relationships. One-third of interventions considered matters of intimacy and relationships (n = 12; 32%), such as sexual agreements (e.g., non-monogamy) and couple communication (e.g., about sexual desire, conflict).

Positive Sexuality, which refers to the "appropriate experimentation, affirming sensuality, attaining sexual competence through the ability to get and give sexual pleasure" [46] was the target of 11 interventions (30%). These targeted issues such as sexual satisfaction, positive aspects of participant sex lives, attraction, and sexual desire.

Body Image. Issues within this dimension were addressed by 4 interventions (11%) and broached body image concerns or dissatisfaction.

Spirituality. This dimension, which includes religious, moral, and ethical concerns surrounding sexuality, was the target of 3 interventions (8%).

Sexual Anatomy Functioning. Few interventions addressed this dimension (n = 2; 5%). One intervention targeted erectile dysfunction and the other generally targeted functioning and dysfunction.

Masturbation and Fantasy. This dimension was addressed by only one intervention (3%) [49].

Intervention Characteristics

A substantial number of interventions was group-based (*n* = 15; 41%) and used counselling techniques (*n* = 21; 57%). Most interventions were based on Cognitive-Behavioral Therapy strategies (*n* = 11; 30%), the Information-Motivation-Behavioral Skills Model (*n* = 6; 16%), and Social Cognitive Theory (SCT; *n* = 5; 13%). Motivational interviewing was the most commonly used counselling technique (*n* = 8; 22%). Screening tools, such as self-assessment of risk behavior, intimate partner violence screening, and a patient-reported outcome measure for sexual satisfaction, were also common (*n* = 8; 22%). Online interventions (*n* = 5; 13%) were usually in the form of discussion forums where participants could talk about their sexual health problems (*n* = 3; 8%), seek information (*n* = 1; 3%), or share test results (*n* = 1; 3%). Further characteristics of the interventions are listed in Table 2.

Participants

All interventions provided information on the participants (Table 2). Most interventions targeted GBM (*n* = 31; 84%). Among these, 19 (51%) concerned exclusively GBM living with HIV, while 12 (32%) targeted GBM irrespective of HIV status. Six interventions (13%) targeted people living with HIV generally. Sub-populations included substance-users (n = 5; 13%), male couples (*n* = 2; 5%), older people living with HIV (*n* = 3; 8%), Black MSM (*n* = 2; 5%), and survivors of childhood sexual abuse (*n* = 2; 5%).

Settings

Intervention settings were equally distributed between primary care (*n* = 15; 40%) – among which 4 were specifically for lesbian, gay, bisexual, transgender populations – and community-based (*n* = 16; 43%), with 3 (8%) interventions delivered in both settings. In addition, one intervention (3%) took place in individual psychotherapy [66] and 2 were led online (5%).

Analysis of Implementation Barriers and Facilitators

Results of the content analysis are presented according to the five domains of the Consolidated Framework for Implementation Research [64]. Forty-one documents provided data for this analysis. The number of documents contributing to each finding are reported in parentheses (Table 3).

Characteristics of the Intervention

Most documents mentioned multiple factors concerning intervention characteristics. Facilitators (*n* = 32; 78%) were their effectiveness (*n* = 17; 41; e.g., success in modifying the targeted behavior), their acceptability (*n* = 13; 32%), and feasibility (*n* = 10; 24%). Commonly cited barriers (*n* = 21; 51%) were concerns around effectiveness (*n* = 10; 24%) e.g., long-term), issues with the instruments used (*n* = 4; 10%; e.g., non-validated scales), excessive duration (*n* = 3; 7%; e.g., 2-hour duration), and costliness (*n* = 2; 5%).

Characteristics of the Individuals Involved

This dimension describes the roles of the individuals involved in the interventions. More specifically, interventions mentioned barriers (*n* = 15; 37%) and facilitators (*n* = 18; 44%) related to healthcare providers, and to the needs and perceptions of the targeted participants. Barriers included participants' characteristics (e.g., discomfort disclosing sexual problems; *n* = 14; 34%), their lack of interest in the interventions (*n* = 5; 12%), and providers' characteristics (*n* = 6; 15%; e.g., lack of expertise, discomfort when addressing sexuality-related topics). Facilitators were participant interest and satisfaction with the interventions (n = 18; 18%), provider knowledge and expertise in sexual health (n = 6; 15%), a good patient-provider relationship (n = 5; 12%), and other participants' characteristics (n = 3; 7%; e.g., motivation to change a target behavior).

Inner Setting

The inner setting describes the setting in which the intervention is implemented. Barriers (*n* = 7; 17%) related to this dimension were resource constraints (*n* = 5; 12%; e.g., related to staff training, time), and sparse follow-up visits (*n* = 1; 2%; e.g., fewer HIV routine primary care visits per year). Facilitators (*n* = 7; 17%) were clinic characteristics (n = 5; 12%; e.g., their capacity to retain participants and implement interventions) and supportive environments (*n* = 1; 2%)

Outer Setting

The outer setting describes the context in which the inner setting of the intervention is located (e.g., community, health system, state). This dimension of the model was less mentioned than the previous ones. Barriers (*n* = 5; 12%) included a lack of integration between services (n = 2; 5%; e.g., sexual health and mental health), and structural issues (*n* = 3; 7%; e.g., HIV-stigma). Facilitators (*n* = 4; 10%) in this context were, ease of dissemination of interventions (*n* = 2; 5%), availability of referral services (*n* = 1; 2%; e.g., intimate partner violence support services), and generalizability of intervention results to real-life settings (*n* = 1; 2%).

Process of Implementation

Facilitators to the process of implementation, i.e., the activities and strategies to implement the interventions, were mentioned only by 2 documents (5%), namely one covering a web-based intervention [67] and another about a group-based counselling intervention [68]. The first was implemented thanks to a successful advertising strategy and promotional materials. The second was easily implemented thanks to its short duration and simplicity. No barriers related to this dimension were mentioned.

DISCUSSION

This review helped identify which sexual problems are addressed among GBM living with HIV in high-income countries, with which types of interventions, and the barriers and

facilitators to their implementation. Here, based on our findings, we present key areas to consider for future research and interventions.

1. *Sexual risk reduction was the most common intervention target.* Over two-thirds of the 37 included interventions had sexual risk reduction as their primary target, consistent with past work [10]. Indeed, Sexual Health Care/Safer Sex was the most frequently addressed dimension of Robinson's Model. In addition, the dimension Talking About Sex, addressed by over half, emphasized HIV disclosure and negotiation with sex partners (e.g., serosorting, condom use). As limiting new HIV infection is a public health priority [69], most funding allocated towards research concerning the sexual health of people living with HIV prioritizes this issue [70]. However, syndemic theory states that problems such as substance abuse, violence, sexual abuse, discrimination, frequently occur simultaneously, interacting and reinforcing one another, leading to poor health outcomes (e.g., mental health issues, HIV and STIs) and increased risk behavior [71-74]. Hence, among GBM, it is crucial to address sexual risk behavior in combination with co-occurring sexual problems, since interventions which ignore these contextual factors may be less likely to succeed [75]. Over half of the interventions in our sample focused exclusively on risk reduction (Sexual Health Care and Safer Sex) in combination of HIV disclosure strategies (Talking About Sex), and few addressed co-occurring syndemics (e.g., substance abuse), with only few explicitly taking a syndemic approach [68,73,74,76]. A syndemic approach to sexual health intervention in this population is thus a promising avenue for further investigation.

Notably, no interventions considered biomedical approaches to risk. Most were dated before 2017-2018, when PrEP became increasingly available for GBM at-risk of HIV acquisition [77,78] and the efficacy of "treatment as prevention" was confirmed [57]. Future interventions may better reflect that such measures are significantly more effective at preventing HIV transmission between serodiscordant partners than behavioural risk reduction

strategies [79]. Interventions combining behavioural and biomedical interventions will likely show greater effectiveness in reducing HIV transmission [80,81].

2. *Intimate partner violence, body image issues, and sexual functioning were relatively under addressed*. The Challenges dimension was a commonly addressed domain, targeted by over half of the interventions in our sample, since it broadly included sexual abuse, childhood sexual abuse, intimate partner violence, substance/alcohol abuse, and sexual compulsivity. However, overall, interventions addressing intimate partner violence were few. Although GBM have similar rates of intimate partner violence compared to women in relationships with men [82-84], with implications for HIV transmission [83], no intimate partner violence intervention in our sample exclusively targeted GBM, suggesting the need for population-specific interventions. Similarly, body image dissatisfaction was considered only by 4 interventions, despite literature showing that GBM struggle with such issues at higher rates compared to the sexual majority [85,86], given the emphasis on physical attractiveness and desirability in gay communities [86-88]. However, literature is ambivalent about whether GBM living with HIV have higher rates of body image dissatisfaction compared to HIV-negative GBM, or whether sexual orientation alone explains this differential [85]. Indeed, other factors contribute to body image issues among people living with HIV, such as weight gain [89,90] and fat redistribution that can occur as a side effect of antiretroviral therapy [91,92], such as lipodystrophy [93,94]. Lipodystrophy is associated with diminished interest and enjoyment of sex [95], problems with interpersonal relationships, social isolation and unprotected sex [96], and reduced self-esteem and depression [97]. Hence, it is crucial to address body image concerns and their biopsychosocial predictors when considering HIV-related health and overall sexual health.

Additionally, we identified only two documents focusing on Sexual Anatomy Functioning, namely Positive Connections [49], which was based on the Sexual Health Model, and a study

investigating erectile dysfunction medication prescription across several healthcare settings in the United States [98]. Importantly, erectile dysfunction rates are higher among GBM with HIV compared to HIV-negative GBM, possibly due to biomedical reasons, such as side effects of antiretroviral therapy, or psychogenic ones, such as HIV transmission anxiety, body appearance changes, and depression [1,5-8]. Given that several clinical guidelines and recommendations to treat sexual disfunctions in men living with HIV are available [99-101], it is likely that most interventions, such as medication prescription and counselling, are occurring between patients and providers in healthcare settings, without being published in the literature.

3. *Most interventions were group-based and rooted in social psychology and behavioral change theories*. These theories take into account the influence of individual experiences, social and environmental factors on health behavior, namely: Social Cognitive Theory [102]; the Information-Motivation-Behavioral Skills model [103]; and the transtheoretical model of behavioral change [104]. Behavioral HIV interventions were common in the early years of the HIV epidemic when biomedical options were unavailable [105], with most interventions being group-delivered, using cognitive-behavioral approaches, with the aim of changing participants' attitudes, beliefs, and behaviors [106]. A systematic review identified interventions targeting GBM with HIV as mostly ineffective at reducing sexual risk behavior, especially when group-delivered, as they were not evidence-based [107]. On the other hand, clinical settings where people with HIV receive care and associated social services may be more effective at changing sexual risk behavior and preventing HIV transmission [107,108]. This would imply prioritizing interventions conducted at the individual level in settings where other services are also offered, with the opportunity to address sexual problems beyond risk.

4. *Counselling techniques such as cognitive-behavioral therapy were common*. Literature has shown that cognitive behavioral therapy has great efficacy in changing targeted behaviors, or modifying thoughts and emotions associated with an event or behavior [109]. Motivational interviewing was another widely used counselling client-centered technique, which allows flexibility as participants are able to autonomously choose their behavioral-change goals, and it is based on understanding the patient's own motivation and on their empowerment [110]. As it has proven efficacy in reducing sexual risk behaviors [111], these techniques can be promising when used in interventions aimed at changing risky sexual behavior.

5. *Implementation barriers and facilitators emphasized the characteristics of the interventions and of the individuals involved*. Most barriers and facilitators concerned the interventions themselves: facilitators were effectiveness in changing the target behavior, acceptability, and feasibility, while barriers were tied to concerns about long-term effectiveness, excessive duration, and costs. This highlights the importance of financially feasible, effective, and acceptable interventions. Characteristics of the individuals involved were consistent with previous literature [17-19,34,37-40]. Cited barriers included lack of provider training around sexuality-related topics or the intervention techniques [79]; time and resource constraints [112,113]; and discomfort disclosing sexual behavior or problems, particularly sensitive ones such as sexual abuse and intimate partner violence [113,114]. Facilitators were perceiving providers as experts, friendly, and/or trustworthy [74,114,115], similar to studies beyond our review which mentioned providers' relaxed attitude and long-term relationship with patients as facilitators [3,39]. These findings suggest that interventions should receive patients in a supportive, non-stigmatizing environment, where their needs can be met by providers who are adequately trained on sexual health-related topics.

LIMITATIONS

This rapid scoping review presents several limitations. First, the criteria to include only documents in English may have limited our search, potentially excluding relevant documents written in other languages and overrepresenting research conducted in the United States, where the majority of interventions in our sample were based. The focus on OECD countries makes the findings not generalizable to GBM living with HIV in middle- and low-income countries, where the sexual health challenges of this population might differ compared to high-income countries due to differences in social and cultural norms, as well as the interventions to address them [116].

Due to broad interpretations of the concept of "sexual problems", the interrater reliability agreement was low among the two reviewers at the abstract screening stage. As the review proceeded, disagreements were resolved and clarification around the concept occurred, which explains the higher agreement after full-text screening.

It is likely that our review did not identify all the interventions targeting the sexual problems of GBM living with HIV. Since several interventions were group-based, most of the problems addressed by interventions in primary care settings between patients and providers might not have been captured by our search strategy. Similarly, community-based organizations may not always have the resources to publish on their interventions [117].

CONCLUSIONS

This review could serve policymakers, healthcare providers and other actors in the planning of future interventions to improve the sexual wellbeing of GBM living with HIV. Consistent with past work [10,11], it showed that the most addressed sexual problems by the included interventions concerned sexual risk reduction, given the prevalence of the dimensions of Sexual Health Care/Safer Sex (e.g., condom use) and Talking about Sex (e.g., HIV disclosure strategies). About one-third of interventions focused each on Culture and Sexual Identity;

Intimacy and Relationship; and Positive Sexuality but few addressed intimate partner violence (Challenges), erectile dysfunction (Sexual Anatomy Functioning), and Body Image dissatisfaction. Given apparent high rates of the latter issues among GBM with HIV, these findings suggest they could receive more attention within clinical care and at the community level. Implementation barriers and facilitators mostly concerned the characteristics of the interventions and of the individuals involved, highlighting the importance of well-designed interventions delivered by properly trained persons. As research and practice thus far has prioritized a public health-centered approach to sexual health, with a focus on HIV risk-reduction [10,11], it is time to promote a more patient-centered one, to improve understanding of the spectrum of sexual problems faced by this population and the comprehensiveness of sexual health services.

REFERENCES

1. Bourne A, Hickson F, Keogh P, Reid D, Weatherburn P. Problems with sex among gay and bisexual men with diagnosed HIV in the United Kingdom. BMC Public Health. 2012;12(1):916; https://doi.org/10.1186/1471-2458-12-916
2. Huntingdon B, Muscat DM, de Wit J, Duracinsky M, Juraskova I. Factors associated with erectile dysfunction among men living with HIV: A systematic review. Aids care. 2020;32(3):275-285; https://doi.org/10.1080/09540121.2019.1653443
3. Sandfort TG, Collier KL, Grossberg R. Addressing sexual problems in HIV primary care: experiences from patients. Arch Sex Behav. 2013;42(7):1357-1368; https://doi.org/10.1007/s10508-012-0009-5
4. Cove J, Petrak J. Factors associated with sexual problems in HIV-positive gay men. Int J STD AIDS. 2004;15(11):732-736; https://doi.org/10.1258/0956462042395221
5. Hirshfield S, Chiasson MA, Wagmiller Jr RL, et al. Sexual dysfunction in an Internet sample of US men who have sex with men. The journal of sexual medicine. 2010;7(9):3104-3114; https://doi.org/10.1111/j.1743-6109.2009.01636.x
6. Lamba H, Goldmeier D, Mackie NE, Scullard G. Antiretroviral therapy is associated with sexual dysfunction and with increased serum oestradiol levels in men. International journal of STD & AIDS. 2004;15(4):234-237; https://doi.org/10.1258/095646204773557749
7. Santi D, Brigante G, Zona S, Guaraldi G, Rochira V. Male sexual dysfunction and HIV--a clinical perspective. Nat Rev Urol. 2014;11(2):99-109; https://doi.org/10.1038/nrurol.2013.314
8. Zona S, Guaraldi G, Luzi K, et al. Erectile dysfunction is more common in young to middle-aged HIV-infected men than in HIV-uninfected men. The journal of sexual medicine. 2012;9(7):1923-1930; https://doi.org/10.1111/j.1743-6109.2012.02750.x

9. Tiefer L, Hall M, Tavris C. Beyond dysfunction: A new view of women's sexual problems. Journal of Sex & Marital Therapy. 2002;28(sup1):225-232; https://doi.org/10.1080/00926230252851357

10. Huntingdon B, de Wit J, Duracinsky M, Juraskova I. The current state of qualitative research on sexual functioning with HIV in developed nations: a thematic synthesis. Sexual and Relationship Therapy. 2018;35(3):400-418; https://doi.org/10.1080/14681994.2018.1543944

11. Higa DH, Crepaz N, McDonald CM, et al. HIV prevention research on men who have sex with men: a scoping review of systematic reviews, 1988–2017. AIDS Education and Prevention. 2020;32(1):1-S7; https://doi.org/10.1521/aeap.2020.32.1.1

12. Teeraananchai S, Kerr SJ, Amin J, Ruxrungtham K, Law MG. Life expectancy of HIV-positive people after starting combination antiretroviral therapy: a meta-analysis. HIV Med. 2017;18(4):256-266; https://doi.org/10.1111/hiv.12421

13. De Cock KM, El-Sadr WM, Ghebreyesus TA. Game Changers: Why Did the Scale-Up of HIV Treatment Work Despite Weak Health Systems? JAIDS Journal of Acquired Immune Deficiency Syndromes. 2011;57; https://doi.org/10.1111/hiv.12421

14. UNAIDS. 2021; https://kpatlas.unaids.org/. Accessed May 27, 2022.

15. CATIE. Canadian HIV treatment, care and support guidelines. 2017; https://www.catie.ca/prevention-in-focus/canadian-hiv-treatment-care-and-support-guidelines. Accessed May 27th, 2022.

16. Catalan J, Meadows J. Sexual dysfunction in gay and bisexual men with HIV infection: evaluation, treatment and implications. AIDS Care. 2000;12(3):279-286; https://doi.org/10.1080/09540120050042927

17. Hijazi L, Nandwani R, Kell P. Medical management of sexual difficulties in HIV-positive individuals. Int J STD AIDS. 2002;13(9):587-592; https://doi.org/10.1258/09564620260216272

18. Trotta MP, Ammassari A, Murri R, Monforte A, Antinori A. Sexual dysfunction in HIV infection. Lancet. 2007;369(9565):905-906; https://doi.org/10.1016/S0140-6736(07)60446-2

19. Leyva-Moral JM, Feijoo-Cid M, Torrella Domingo A, et al. Exploration of clients living with HIV needs for reporting on experiences with sex. Nurs Health Sci. 2020;22(3):570-576; https://doi.org/10.1111/nhs.12696

20. Miners A, Phillips A, Kreif N, et al. Health-related quality-of-life of people with HIV in the era of combination antiretroviral treatment: a cross-sectional comparison with the general population. Lancet HIV. 2014;1(1):e32-40; https://doi.org/10.1016/S2352-3018(14)70018-9

21. Den Daas C, Van den Berk G, Kleene M-J, De Munnik E, Lijmer J, Brinkman K. Health-related quality of life among adult HIV positive patients: assessing comprehensive themes and interrelated associations. Quality of Life Research. 2019;28(10):2685-2694; https://doi.org/10.1007/s11136-019-02203-y

22. Perry NS, Remmert JE, Psaros C, Pinkston M, Safren SA. Learning to address multiple syndemics for people living with HIV through client perspectives on CBT. Psychotherapy Research. 2019;29(4):492-502; https://doi.org/10.1080/10503307.2017.1380863

23. Vallecillo G, Losada A, Inciarte A, et al. Increasing emergency department admissions for chemsex-related intoxications in Barcelona, Spain, among people living with HIV: an observational study from 2018 to 2020. BMC Public Health. 2022;22(1):1-6; https://doi.org/10.1186/s12889-022-12763-3

24. Miguez-Burbano MJ, Espinoza L, Lewis JE. HIV treatment adherence and sexual functioning. AIDS Behav. 2008;12(1):78-85; https://doi.org/10.1007/s10461-006-9197-0

25. Vanable PA, Carey MP, Brown JL, Littlewood RA, Bostwick R, Blair D. What HIV-positive MSM want from sexual risk reduction interventions: findings from a qualitative study. AIDS Behav. 2012;16(3):554-563; https://doi.org/10.1007/s10461-011-0047-3

26. El-Sadr WM, Rabkin M, DeCock KM. Population health and individualized care in the global AIDS response: synergy or conflict? AIDS. 2016;30(14):2145-2148; https://doi.org/10.1097/QAD.0000000000001192

27. Waters L, Lord E, Mackie N, et al. BHIVA/BASHH/FSRH guidelines for the sexual & reproductive health of people living with HIV: BHIVA; 2017.

28. CDC. 2016; https://www.cdc.gov/msmhealth/stigma-and-discrimination.htm. Accessed October 11, 2021.

29. Stojisavljevic S, Djikanovic B, Matejic B. 'The Devil has entered you': A qualitative study of Men Who Have Sex With Men (MSM) and the stigma and discrimination they experience from healthcare professionals and the general community in Bosnia and Herzegovina. PLoS One. 2017;12(6):e0179101; https://doi.org/10.1371/journal.pone.0179101

30. Fitzgerald-Husek A, Van Wert MJ, Ewing WF, et al. Measuring stigma affecting sex workers (SW) and men who have sex with men (MSM): A systematic review. PLoS One. 2017;12(11):e0188393; https://doi.org/10.1371/journal.pone.0188393

31. Nyblade L, Stockton MA, Giger K, et al. Stigma in health facilities: why it matters and how we can change it. BMC Med. 2019;17(1):25; https://doi.org/10.1186/s12916-019-1256-2

32. Kumar N, Forastiere L, Zhang T, et al. Lack of sexual behavior disclosure may distort STI testing outcomes. BMC Public Health. 2020;20(1):616; https://doi.org/10.1186/s12889-020-08768-5

33. den Daas C, Doppen M, Schmidt AJ, Op de Coul E. Determinants of never having tested for HIV among MSM in the Netherlands. BMJ Open. 2016;6(1):e009480; https://doi.org/10.1136/bmjopen-2015-009480

34. Gios L, Mirandola M, Sherriff N, et al. Being in the Closet. Correlates of Outness Among MSM in 13 European Cities. J Homosex. 2021;68(3):415-433; https://doi.org/10.1080/00918369.2019.1656033

35. Eaton LA, Driffin DD, Kegler C, et al. The role of stigma and medical mistrust in the routine health care engagement of black men who have sex with men. Am J Public Health. 2015;105(2):e75-82; https://doi.org/10.2105/AJPH.2014.302322

36. Meanley S, Gale A, Harmell C, Jadwin-Cakmak L, Pingel E, Bauermeister JA. The role of provider interactions on comprehensive sexual healthcare among young men who have sex with men. AIDS Educ Prev. 2015;27(1):15-26; https://doi.org/10.1521/aeap.2015.27.1.15

37. Hinchliff S, Gott M, Galena E. 'I daresay I might find it embarrassing': general practitioners' perspectives on discussing sexual health issues with lesbian and gay patients. Health & social care in the community. 2005;13(4):345-353; https://doi.org/10.1111/j.1365-2524.2005.00566.x

38. Swartzendruber A, Zenilman JM. A national strategy to improve sexual health. JAMA : the journal of the American Medical Association. 2010;304(9):1005-1006; https://doi.org/10.1001/jama.2010.1252

39. Zhang X, Sherman L, Foster M. Patients' and providers' perspectives on sexual health discussion in the United States: A scoping review. Patient Educ Couns. 2020;103(11):2205-2213; https://doi.org/10.1016/j.pec.2020.06.019

40. Ronot-Brégigeon S, Lions C, Zaegel-Faucher O, et al. HIV-infected patients' expectations about emotional and sexual health. Sexologies. 2019;28(1):e7-e10; https://doi.org/10.1016/j.sexol.2017.12.005

41. Khangura S, Konnyu K, Cushman R, Grimshaw J, Moher D. Evidence summaries: the evolution of a rapid review approach. Syst Rev. 2012;1(1):10; https://doi.org/10.1186/2046-4053-1-10

42. Tricco AC, Langlois E, Straus SE, Organization WH. *Rapid reviews to strengthen health policy and systems: a practical guide*: World Health Organization; 2017.

43. Colquhoun H. Current best practices for the conduct of scoping reviews. EQUATOR Netw. 2016;

44. Colquhoun HL, Levac D, O'Brien KK, et al. Scoping reviews: time for clarity in definition, methods, and reporting. J Clin Epidemiol. 2014;67(12):1291-1294; https://doi.org/10.1016/j.jclinepi.2014.03.013

45. Peters MD, Godfrey C, McInerney P, Munn Z, Tricco AC, Khalil H. Chapter 11: scoping reviews (2020 version). JBI manual for evidence synthesis, JBI. 2020;2020;

46. Robinson BB, Bockting WO, Rosser BR, Miner M, Coleman E. The Sexual Health Model: application of a sexological approach to HIV prevention. Health Educ Res. 2002;17(1):43-57; https://doi.org/10.1093/her/17.1.43

47. Edwards WM, Hamilton AR, Miner MH, Coleman E. Measuring sexual health: preliminary development of a sexual health inventory. Sexual and Relationship Therapy. 2017;32(2):146-154; https://doi.org/10.1080/14681994.2016.1225154

48. Rosser BS, Bockting WO, Rugg DL, et al. A randomized controlled intervention trial of a sexual health approach to long-term HIV risk reduction for men who have sex with men: effects of the intervention on unsafe sexual behavior. AIDS Education and Prevention. 2002;14(3 Supplement):59-71; https://doi.org/10.1521/aeap.14.4.59.23885

49. Rosser BR, Hatfield LA, Miner MH, et al. Effects of a behavioral intervention to reduce serodiscordant unsafe sex among HIV positive men who have sex with men: the Positive Connections randomized controlled trial study. J Behav Med. 2010;33(2):147-158; https://doi.org/10.1007/s10865-009-9244-1

50. The World Bank. The World by Income and Region. https://datatopics.worldbank.org/world-development-indicators/the-world-by-income-and-region.html. Accessed May 27, 2022.

51. Geary RS, Tanton C, Erens B, et al. Sexual identity, attraction and behaviour in Britain: The implications of using different dimensions of sexual orientation to estimate the size of sexual minority populations and inform public health interventions. PLoS One. 2018;13(1):e0189607; https://doi.org/10.1371/journal.pone.0189607

52. NCI. Definition of Intervention. https://www.cancer.gov/publications/dictionaries/cancer-terms/def/intervention.

53. Beyrer C, Baral SD, van Griensven F, et al. Global epidemiology of HIV infection in men who have sex with men. Lancet. 2012;380(9839):367-377; https://doi.org/10.1016/S0140-6736(12)60821-6

54. Liu B, Yu M, Chen J, Li W. The HIV prevalence in older men who have sex with men in Western & Central Europe and North America—a meta-analysis. International

journal of STD & AIDS. 2021;32(4):352-360; https://doi.org/10.1177/0956462420967576

55. Beyrer C, Sullivan P, Sanchez J, et al. The increase in global HIV epidemics in MSM. AIDS. 2013;27(17):2665-2678; https://doi.org/10.1097/01.aids.0000432449.30239.fe

56. HIV.gov. HIV Treatment as Prevention. 2023; https://www.hiv.gov/tasp.

57. Rodger A, Cambiano V, Bruun T, et al. Risk of HIV transmission through condomless sex in MSM couples with suppressive ART: The PARTNER2 Study extended results in gay men. Journal of the International AIDS Society. 2018;21(Supplement 6):163-163; https://doi.org/10.1016/S0140-6736(19)30418-0

58. The Lancet H. U=U taking off in 2017. Lancet HIV. 2017;4(11):e475; https://doi.org/10.1016/S2352-3018(17)30183-2

59. Grant RM, Lama JR, Anderson PL, et al. Preexposure chemoprophylaxis for HIV prevention in men who have sex with men. New England Journal of Medicine. 2010;363(27):2587-2599; https://doi.org/10.1056/NEJMoa1011205

60. Molina J-M, Capitant C, Spire B, et al. On demand PrEP with oral TDF-FTC in MSM: results of the ANRS Ipergay trial. Paper presented at: Conference on retroviruses and opportunistic infections2015. https://doi.org/10.1097/COH.0000000000000216

61. Grant RM, Koester KA. What people want from sex and PrEP. Current Opinion in HIV and AIDS. 2016;11(1):3; https://doi.org/10.1097/COH.0000000000000216

62. McHugh ML. Interrater reliability: the kappa statistic. Biochem Med (Zagreb). 2012;22(3):276-282;

63. Mikkonen K, Kääriäinen M. Content Analysis in Systematic Reviews. In: Kyngäs H, Mikkonen K, Kääriäinen M, eds. *The Application of Content Analysis in Nursing Science Research*. Cham: Springer International Publishing; 2020:105-115.

64. Damschroder LJ, Aron DC, Keith RE, Kirsh SR, Alexander JA, Lowery JC. Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science. Implementation science. 2009;4(1):1-15; https://doi.org/10.1186/1748-5908-4-50

65. Rosser SBR, Oakes JM, Konstan J, et al. Reducing HIV risk behavior of men who have sex with men through persuasive computing: results of the Men's INTernet Study-II. Aids. 2010;24(13):2099-2107; https://doi.org/10.1097/QAD.0b013e32833c4ac7

66. Graber LS. Not a victim: How self-deception saved David. J Clin Psychol. 2020;76(2):258-265; https://doi.org/10.1002/jclp.22892

67. Adam BD, Murray J, Ross S, Oliver J, Lincoln SG, Rynard V. hivstigma.com, an innovative web-supported stigma reduction intervention for gay and bisexual men. Health Educ Res. 2011;26(5):795-807; https://doi.org/10.1093/her/cyq078

68. Kurtz SP, Stall RD, Buttram ME, Surratt HL, Chen M. A randomized trial of a behavioral intervention for high risk substance-using MSM. Aids Behav. 2013;17(9):2914-2926; https://doi.org/10.1007/s10461-013-0531-z

69. Koenig LJ, Lyles CM, Higa D, Mullins MM, Sipe TA. Research Synthesis, HIV Prevention Response, and Public Health: CDC's HIV/AIDS Prevention Research Synthesis Project. Public Health Rep. 2022;137(1):32-47; https://doi.org/10.1177/0033354920988871

70. CDC. 2023; HIV Funding and Budget. https://www.cdc.gov/hiv/funding/index.html

71. Mustanski B, Garofalo R, Herrick A, Donenberg G. Psychosocial health problems increase risk for HIV among urban young men who have sex with men: preliminary evidence of a syndemic in need of attention. Annals of Behavioral Medicine. 2007;34(1):37-45; https://doi.org/10.1007/BF02879919

72. Stall R, Mills TC, Williamson J, et al. Association of co-occurring psychosocial health problems and increased vulnerability to HIV/AIDS among urban men who have sex with men. American journal of public health. 2003;93(6):939-942; https://doi.org/10.2105/ajph.93.6.939

73. Achterbergh RCA, van der Helm JJ, van den Brink W, de Vries HJC. Design of a syndemic based intervention to facilitate care for men who have sex with men with high risk behaviour: the syn.bas.in randomized controlled trial. BMC Infect Dis. 2017;17(1):398; https://doi.org/10.1186/s12879-017-2474-x

74. Achterbergh RCA, van Rooijen MS, van den Brink W, Boyd A, de Vries HJC. Enhancing help-seeking behaviour among men who have sex with men at risk for sexually transmitted infections: the syn.bas.in randomised controlled trial. Sex Transm Infect. 2021;97(1):11-17; https://doi.org/10.1136/sextrans-2020-054438

75. Pantalone DW, Nelson KM, Batchelder AW, Chiu C, Gunn HA, Horvath KJ. A systematic review and meta-analysis of combination behavioral interventions co-targeting psychosocial syndemics and HIV-related health behaviors for sexual minority men. The Journal of Sex Research. 2020;57(6):681-708; https://doi.org/10.1080/00224499.2020.1728514

76. Parsons JT, Rendina HJ, Moody RL, Gurung S, Starks TJ, Pachankis JE. Feasibility of an Emotion Regulation Intervention to Improve Mental Health and Reduce HIV Transmission Risk Behaviors for HIV-Positive Gay and Bisexual Men with Sexual Compulsivity. Aids Behav. 2017;21(6):1540-1549; https://doi.org/10.1007/s10461-016-1533-4

77. Hart TA, Noor SW, Skakoon-Sparling S, et al. GPS: A Randomized Controlled Trial of Sexual Health Counseling for Gay and Bisexual Men Living With HIV. Behav Ther. 2021;52(1):1-14; https://doi.org/10.1016/j.beth.2020.04.005

78. Brown JL, Vanable PA, Bostwick RA, Carey MP. A Pilot Intervention Trial to Promote Sexual Health and Stress Management Among HIV-Infected Men Who Have Sex with Men. Aids Behav. 2019;23(1):48-59; https://doi.org/10.1007/s10461-018-2234-y

79. Hart TA, Willis AC, Simpson SH, et al. Gay Poz Sex: A Sexual Health Promotion Intervention for HIV-Positive Gay and Bisexual Men. Cognitive and Behavioral Practice. 2016;23(4):517-529; https://doi.org/10.1016/j.cbpra.2015.11.002

80. Kurth AE, Celum C, Baeten JM, Vermund SH, Wasserheit JN. Combination HIV prevention: significance, challenges, and opportunities. Curr HIV/AIDS Rep. 2011;8(1):62-72; https://doi.org/10.1007/s11904-010-0063-3

81. Brown JL, Sales JM, DiClemente RJ. Combination HIV prevention interventions: the potential of integrated behavioral and biomedical approaches. Curr HIV/AIDS Rep. 2014;11(4):363-375; https://doi.org/10.1007/s11904-014-0228-6

82. Finneran C, Stephenson R. Intimate Partner Violence Among Men Who Have Sex With Men:A Systematic Review. Trauma, Violence, & Abuse. 2013;14(2):168-185; https://doi.org/10.1177/1524838012470034

83. Buller AM, Devries KM, Howard LM, Bacchus LJ. Associations between intimate partner violence and health among men who have sex with men: a systematic review and meta-analysis. PLoS medicine. 2014;11(3):e1001609; https://doi.org/10.1371/journal.pmed.1001609

84. Liu M, Cai X, Hao G, et al. Prevalence of intimate partner violence among men who have sex with men: An updated systematic review and meta-analysis. Sexual medicine. 2021;9(6):100433; https://doi.org/10.1016/j.esxm.2021.100433

85. Blashill AJ, Vander Wal JS. Components of body image in gay men with HIV/AIDS. American Journal of Men's Health. 2011;5(1):6-10; https://doi.org/10.1177/1557988309356942

86. Siconolfi D, Halkitis PN, Allomong TW, Burton CL. Body dissatisfaction and eating disorders in a sample of gay and bisexual men. International Journal of Men's Health. 2009;8(3):254; https://doi.org/10.3149/jmh.0803.254

87. Siconolfi DE, Kapadia F, Moeller RW, et al. Body Dissatisfaction in a Diverse Sample of Young Men Who Have Sex With Men: The P18 Cohort Study. Arch Sex Behav. 2016;45(5):1227-1239; https://doi.org/10.1007/s10508-015-0592-3

88. Tiggemann M, Martins Y, Kirkbride A. Oh to be lean and muscular: body image ideals in gay and heterosexual men. Psychology of Men & Masculinity. 2007;8(1):15; https://doi.org/10.1037/1524-9220.8.1.15

89. Eckard AR, McComsey GA. Weight gain and integrase inhibitors. Curr Opin Infect Dis. 2020;33(1):10-19; https://doi.org/10.1097/QCO.0000000000000616

90. Kanters S, Renaud F, Rangaraj A, et al. Evidence synthesis evaluating body weight gain among people treating HIV with antiretroviral therapy-a systematic literature review and network meta-analysis. Eclinicalmedicine. 2022;48:101412; https://doi.org/10.1016/j.eclinm.2022.101412

91. Verhaegen AA, Van Gaal LF. Drugs that affect body weight, body fat distribution, and metabolism. Endotext [Internet]. 2019;

92. Koethe JR, Lagathu C, Lake JE, et al. HIV and antiretroviral therapy-related fat alterations. Nat Rev Dis Primers. 2020;6(1):48; https://doi.org/10.1038/s41572-020-0181-1

93. Guzman N, Vijayan V. HIV-associated Lipodystrophy. StatPearls. 2022.

94. Carr A. HIV lipodystrophy: risk factors, pathogenesis, diagnosis and management. AIDS. 2003;17 Suppl 1:S141-148;

95. Blanch J, Rousaud A, Martinez E, et al. Factors associated with severe impact of lipodystrophy on the quality of life of patients infected with HIV-1. Clin Infect Dis. 2004;38(10):1464-1470; https://doi.org/10.1086/383573

96. Campbell T, Giannakopoulou C. The psychosocial effects of HIV-related lipodystrophy: a review. AIDS & Hepatitis Digest. 2004(102):1-3;

97. Collins E, Wagner C, Walmsley S. Psychosocial impact of the lipodystrophy syndrome in HIV infection. AIDS Read. 2000;10(9):546-550;

98. Lin X, Mattson CL, Freedman M, Skarbinski J. Erectile dysfunction medication prescription and condomless intercourse in HIV-infected men who have sex with men in the United States. AIDS and Behavior. 2017;21(4):1129-1137; https://doi.org/10.1007/s10461-016-1552-1

99. Montorsi F, Adaikan G, Becher E, et al. Summary of the recommendations on sexual dysfunctions in men. J Sex Med. 2010;7(11):3572-3588; https://doi.org/10.1111/j.1743-6109.2010.02062.x

100. Myette Y, Courtois F. Dysfonctions sexuelles et approches sexothérapeutiques auprès des hommes gais. Sexologies. 2021;30(2):100-121; https://doi.org/10.1016/j.sexol.2021.04.002

101. EACS. Guidelines. 2022; https://www.eacsociety.org/media/guidelines-11.1_final_09-10.pdf.

102. Bandura A. Social cognitive theory: An agentic perspective. Annual review of psychology. 2001;52(1):1-26; https://doi.org/10.1146/annurev.psych.52.1.1

103. Fisher JD, Fisher WA, Misovich SJ, Kimble DL, Malloy TE. Changing AIDS risk behavior: effects of an intervention emphasizing AIDS risk reduction information,

motivation, and behavioral skills in a college student population. Health Psychol. 1996;15(2):114-123; https://doi.org/10.1037//0278-6133.15.2.114

104. Prochaska JO, Velicer WF. The transtheoretical model of health behavior change. Am J Health Promot. 1997;12(1):38-48; https://doi.org/10.4278/0890-1171-12.1.38

105. Hankins CA, de Zalduondo BO. Combination prevention: a deeper understanding of effective HIV prevention. Vol 24: LWW; 2010:S70-S80.

106. Kelly JA, Kalichman SC. Behavioral research in HIV/AIDS primary and secondary prevention: recent advances and future directions. J Consult Clin Psychol. 2002;70(3):626-639;

107. Higa DH, Crepaz N, Marshall KJ, et al. A systematic review to identify challenges of demonstrating efficacy of HIV behavioral interventions for gay, bisexual, and other men who have sex with men (MSM). AIDS Behav. 2013;17(4):1231-1244; https://doi.org/10.1007/s10461-013-0418-z

108. Crepaz N, Lyles CM, Wolitski RJ, et al. Do prevention interventions reduce HIV risk behaviours among people living with HIV? A meta-analytic review of controlled trials. Aids. 2006;20(2):143-157; https://doi.org/10.1097/01.aids.0000196166.48518.a0

109. Beck JS, Beck A. Cognitive behavior therapy. New York: Basics and beyond. Guilford Publication. 2011;

110. Hettema J, Steele J, Miller WR. Motivational interviewing. Annu Rev Clin Psychol. 2005;1(1):91-111; https://doi.org/10.1146/annurev.clinpsy.1.102803.143833

111. Kuyper L, de Wit J, Heijman T, Fennema H, van Bergen J, Vanwesenbeeck I. Influencing risk behavior of sexually transmitted infection clinic visitors: efficacy of a new methodology of motivational preventive counseling. AIDS Patient Care STDS. 2009;23(6):423-431; https://doi.org/10.1089/apc.2008.0144

112. McKirnan DJ, Tolou-Shams M, Courtenay-Quirk C. The Treatment Advocacy Program: a randomized controlled trial of a peer-led safer sex intervention for HIV-infected men who have sex with men. J Consult Clin Psychol. 2010;78(6):952-963; https://doi.org/10.1037/a0020759

113. Kalokhe AS, Paranjape A, Bell CE, et al. Intimate partner violence among HIV-infected crack cocaine users. AIDS Patient Care STDS. 2012;26(4):234-240; https://doi.org/10.1089/apc.2011.0275

114. Siemieniuk RA, Krentz HB, Gish JA, Gill MJ. Domestic violence screening: prevalence and outcomes in a Canadian HIV population. AIDS Patient Care STDS. 2010;24(12):763-770; https://doi.org/10.1089/apc.2010.0235

115. Herder T, Agardh A. Navigating between rules and reality: a qualitative study of HIV positive MSM's experiences of communication at HIV clinics in Sweden about the rules of conduct and infectiousness. AIDS Care. 2019;31(10):1304-1310; https://doi.org/10.1080/09540121.2019.1566590

116. Rebe K, Hoosen N, McIntyre JA. Strategies to improve access for MSM in low-income and middle-income countries. Curr Opin HIV AIDS. 2019;14(5):387-392; https://doi.org/10.1097/COH.0000000000000568

117. Li Y. Benefits & Challenges of Open Access. *The ACS Guide to Scholarly Communication*: American Chemical Society; 2019.

Table 1. APA PsycInfo search strategy, 2002 to June Week 4 2022

#	**Searches**	**Results**
1	Sexual Health/ or *Psychosexual Behavior/ or "Erection (Penis)"/ or Masturbation/ or *"Sexual Intercourse (Human)"/ or exp Sexual Arousal/ or exp Sexual Partners/	23218
2	exp sexual satisfaction/ or pleasure/ or *Orgasm/ or exp Male Orgasm/	6383
3	Sexual Abuse/ or Intimate Partner Violence/ or Body Image/ or Hypersexuality/ or Sex Drive/	34897
4	(sexual* adj (dysfunction* or health or problem* or satisfaction or pleasure or desire or compuls* or violence or abuse or function* or arousal or intercourse or partner* or well-being or wellbeing)).tw.	45133
5	(libido or orgasm* or serosorting or masturbation or sexuality or intimacy or relationship* or "body image" or "problems with sex" or "erectile dysfunction" or "premature ejaculation" or "intimate partner violence" or ipv or "sex drive" or hypersexual*).tw.	588039
6	1 or 2 or 3 or 4 or 5	626804
7	male homosexuality/ or exp bisexuality/ or exp same sex intercourse/	17114
8	(bi or bisex* or gay? or gbmsm or homosexual* or lgbt* or mesm or msm or "men ever reporting sex with men" or "men who have sex with men" or "same sex" or "sexual minority men").tw.	43955
9	7 or 8	44338
10	exp HIV/	33535
11	((Human adj2 (immune deficiency or immuno deficiency or immunodeficiency) adj2 virus) or HIV).tw.	46444
12	10 or 11	47231
13	prescription drugs/	5534
14	*communication/ or exp sex therapy/ or *Psychotherapy/ or *Counseling/ or *Intervention/ or exp Sex Education/	108518

15	(sexual* adj4 (communicat* or interven* or diagnos* or screen* or care* or program* or service* or treat* or therap* or educat* or promot*)).tw.	19492
16	(counsel?ing or psychotherapy or prescri*).tw.	146281
17	13 or 14 or 15 or 16	232616
18	6 and 9 and 12 and 17	980
19	limit 18 to (english language and yr="2010 -Current")	681

Table 2. Interventions to address the Psychosocial Sexual Health Problems of GBM living with HIV.

Intervention name & Reference	OECD Country	Target psychosocial sexual health problem	Sexual Health Model dimension	Characteristics	Setting	Participants
1. syn.bas.in [1,2]	Netherlands	Sexual compulsivity Intimate partner violence Childhood sexual abuse Risk behaviour	Talking about sex Culture & sexual identity Sexual health care & safer sex Challenges	Screening Motivational-Interviewing (MI)	Primary care	MSM with high-risk behaviour who are screened trimonthly for STIs
2. hivstigma.com [3]	Canada	HIV stigma and rejection Homophobia HIV disclosure HIV risk taking	Talking about sex Culture & sexual identity Sexual health care & safer sex	Blog-based discussions	Community -based (online)	Gay and bisexual men
3. Gay Poz Sex (GPS) – Colombia [4]	Colombia	Sexual rejection Sexual sensation seeking Sexual compulsivity Risk behaviour	Talking about sex Sexual health care & safer sex Challenges Intimacy & relationships	Group-based; Information-Motivation-Behavioral (IMB) Skills Model; MI counselling	Community -based	MSM living with HIV
4. Providers Advocating for Sexual Health Initiative (PASHIN) [5-7]	United States	Risk behaviour HIV disclosure Substance use	Talking about sex Sexual health care & safer sex	Computer-assisted, provider-delivered, screening, risk-reduction messages	Primary care	MSM
5. Cognitive-behavioral therapy for body image and self-care (CBT-BISC) [8-10]	United States	Body image disturbances	Body image	Cognitive-Behavioural Therapy (CBT)	LGBT-centered Primary Care	Sexual minority men living with HIV who reported elevated appearance concerns
6. Sexual Health and Stress Management Intervention [11]	United States	Risk behaviour Condom attitudes HIV disclosure	Talking about sex Sexual health care & safer sex	IMB-based group sessions; stress management training	Primary care	HIV-infected MSM

Intervention name & Reference	OECD Country	Target psychosocial sexual health problem	Sexual Health Model dimension	Characteristics	Setting	Participants
7. Patient-Reported Outcome Measure in the Swedish National Quality Assurance Registry (InfCareHIV) [12]	Sweden	Sexual satisfaction	Positive sexuality	Patient-reported outcome measure	Primary care	People living with HIV ≥18 years
8. HIV sexual risk reduction Intervention (HINTS) [13]	United States	HIV disclosure Condom negotiation Risk behaviour	Talking about sex Sexual health care & safer sex	IMB-based, group discussions	Online	GBM living with HIV/AIDS who use the Internet to meet a potential sex partner
9. A Group Intervention to Improve Body Image Satisfaction and Dietary Habits in Gay and Bisexual Men Living With HIV/AIDS [14]	United States	Body image dissatisfaction	Body image	Group discussions including nutrition counseling, media literacy, cognitive dissonance (from *The Body Project*), group facilitation, homework, psychoeducation	Community -based	GBM living with HIV reporting any degree of body image dissatisfaction
10. AWARENESS [15]	United States	Intersectional minority stress	Culture & sexual identity	Individually delivered, 9–session cognitive behavioral intervention	Community -based	Cisgender MSM living with HIV who report at least one instance of drinking 5 or more drinks or using an illicit substance in the previous 3 months.
11. Psychoanalysis and CBT [16]	United States	Sexual abuse	Challenges	Behavioural activation CBT Psychoanalysis	Clinical practice	A gay man with HIV-associated neurocognitive disorder

Intervention name & Reference	OECD Country	Target psychosocial sexual health problem	Sexual Health Model dimension	Characteristics	Setting	Participants
12. The Know*Now Project [17,18]	United States	HIV Status Communication and disclosure HIV stigma Serosorting	Culture & sexual identity Challenges	Seven, one-hour, focus groups; development of a website to provide study participants with their most recent HIV test results	Primary care (Online)	HIV-positive MSM; HIV-negative MSM; HIV-negative heterosexuals (non-MSM)
13. Gay Poz Sex [19-21]	Canada	Risk behaviour Sexual ideal HIV disclosure Positive aspects of participants' sex lives Sexual sensation seeking Sexual compulsivity Sexual rejection	Sexual health care & safer sex Challenges Positive sexuality Intimacy & relationships	Small-group counselling Psychoeducation, MI Cognitive-behavioural skills	Primary Care, Community -based	GBM living with HIV
14. Patient-provider communication [22]	Sweden	HIV disclosure laws	Talking about sex	Patient-provider communication	Primary care	MSM living with HIV in Sweden, on antiretroviral treatment, and reported unmeasurable viral load
15. An Online Randomized Controlled Trial Evaluating HIV Prevention Digital Media Interventions for Men Who Have Sex with Men [23,24]	United States	HIV disclosure Risk behaviour	Talking about sex Sexual health care & safer sex	HIV-prevention videos based on social learning theory, situated cognition, and developmental learning theory	Online	Sexually active MSM

Intervention name & Reference	OECD Country	Target psychosocial sexual health problem	Sexual Health Model dimension	Characteristics	Setting	Participants
16. Project ROADMAP [25]	United States	HIV disclosure Risk behaviour Communication with sexual partners	Talking about sex Sexual health care & safer sex	Psychoeducational group sessions, guided by the IMB model of AIDS risk behavior change and self-efficacy theory	Primary care	People living with HIV aged 45 or older, who are sexually active within the last 12 months
17. Intimate Partner Violence Screening [26]	United States	Intimate partner violence	Challenges	IPV screener and experiences with IPV services	Primary care	HIV-positive, sexually active crack cocaine users
18. Real Talk [27,28]	United States	Alcohol and substance use Condom use and risk behaviour Serosorting Discrimination and intersectionality Around MSM sexuality Sexual harm reduction Communication Building healthy relationships	Talking about sex Culture & sexual identity Sexual health care & safer sex Challenges Intimacy & relationships	Computer-delivered, divided into six modules that combine audio narration, visual presentations, interactive components, games, and video vignettes of Black MSM talking about their lives	Community -based	Black/African American MSM between the ages of 18 and 49 years
19. The DiSH Study [29]	United States	Condoms and lubricant types/preferences Homophobia Sexual identity and HIV serostatus disclosure Risk behaviour	Culture & sexual identity Sexual health care & safer sex Challenges Positive sexuality	Based on SCT; five two-hour group sessions over two weeks with discussions and collective meal preparing	Community -based	Black MSM
20. A Randomized Trial of a Behavioral Intervention for High Risk Substance-Using MSM [30,31]	United States	Risk reduction Interactions of drugs and sex among gay men Homophobia Verbal and physical abuse Attraction / desire Urban gay subcultures Normative drug use	Talking about sex Culture & sexual identity Sexual health care & safer sex Challenges Positive sexuality Intimacy & relationships	Small group intervention based on psychological empowerment theory; initial assessment; MI-based, guided group discussions; referrals for any health and social service needs; individual counseling sessions	Community -based	High risk not-in-treatment MSM substance users between the ages of 18 and 55

Intervention name & Reference	OECD Country	Target psychosocial sexual health problem	Sexual Health Model dimension	Characteristics	Setting	Participants
		Hypersexuality Sense of sexual violation				
21. Erectile Dysfunction Medication Prescription & Risk Reduction Counselling [32]	United States	Erectile dysfunction	Sexual anatomy functioning Sexual health care & safer sex	Erectile dysfunction medication prescription Risk reduction counselling	Primary care	Sexually active MSM who had been diagnosed with HIV for at least 12 months
22. Tele-MI [33,34]	United States	Sexual relationship dynamics Risk behaviour and condom use negotiation Sexual disinhibition substance use Sexual arousal	Culture & sexual identity Sexual health care & safer sex Challenges Positive sexuality Intimacy & relationships	Telephone-administered MI, based on the Transtheoretical Model	Community -based	People living with HIV/AIDS, aged 45 or more, English-speaking with high-risk behaviour and access to a landline or cellular telephone
23. C-Talk [35]	United States	Physiological effects of stimulant use and sex on the brain Homophobia and discrimination HIV disclosure Safer sexual behaviour Sexual compulsivity	Talking about sex Culture & sexual identity Sexual health care & safer sex Challenges	Group discussions based on MI, Social Cognitive Theory, psychoeducation	LGBT-centered Primary Care	Men who reported using stimulants before or during unprotected anal sex in the previous 6 months
24. The Treatment Advocacy Program [6,36]	United States	Risk behaviour Sexual attitudes Mindful sexuality and intimacy Substance use Satisfactions and dissatisfactions regarding intimacy and sexuality HIV communication	Talking about sex Sexual health care & safer sex Challenges Positive sexuality Intimacy & relationships	60–90-min individual counselling sessions and follow-ups; cognitive-behavioral techniques to inculcate self-efficacy and MI; computer-assessment	Primary care	HIV-infected MSM

Intervention name & Reference	OECD Country	Target psychosocial sexual health problem	Sexual Health Model dimension	Characteristics	Setting	Participants
25. "CISS" (computer-assisted intervention for safer sex) [37]	Belgium, Italy, France, Germany, The Netherlands, Poland, Spain, England	Safer sex Relationship issues, emotions and mood Sexuality and pleasure Drugs/alcohol and sex HIV, health and sex HIV disclosure Substance use Risk behaviour and condom use	Talking about sex Sexual health care & safer sex Challenges Positive sexuality Intimacy & relationships	Computer-delivered counselling with video materials and interactive slide shows; guided by IMB and SCT	Primary Care, Community -based	HIV-positive MSM for at least 6 months
26. ESTEEM-SC [38]	United States	Sexual compulsivity Minority stress Substance use Risk behaviour	Culture & sexual identity Sexual health care & safer sex Challenges	CBT	Community -based	HIV-positive cisgender GBM reporting symptoms of sexual compulsivity and high-risk behaviour
27. 40 & Forward [39]	United States	Safer sex & decision making HIV risk reduction practices and discussion Condom use Partner communication	Talking about sex Sexual health care & safer sex	Based on SCT, peer-facilitated group sessions	Primary Care, community-based	MSM of any HIV serostatus, 40 years or older with high-risk behaviour, depression, isolation, and/or social anxiety
28. The Men's INTernet Study-II (MINTS-II) [40]	United States	Risk behaviour Pleasure and sex Dating Body image concerns Spirituality Intimacy and relationships Safer sex	Talking about sex Sexual health care & safer sex Challenges Body image Intimacy & relationships	Computer-delivered active e-learning	Community -based	High-risk MSM

Intervention name & Reference	OECD Country	Target psychosocial sexual health problem	Sexual Health Model dimension	Characteristics	Setting	Participants
29. Positive Connections [41]	United States	Sexual communication Sexual identity Abuse and neglect Compulsivity Victimization, and strategies for recovery Intimacy, dating and relationships Sexual attitudes Sexual expression Sex functioning and dysfunction Safer sex and risk behaviour Sexuality and spirituality Positive sexuality HIV disclosure	All	M2M: a one-weekend, 14–16-h structured large- and small-group intervention	Community -based	MSM living with HIV
30. Project Enhance [6,42,43]	United States	Sexual risk limits. Sexual decision-making ‘‘party drugs’’, ‘‘cultures, communities, and you’’ HIV disclosure Relationships Cultural and sexual identity	Talking about sex Culture & sexual identity Sexual health care & safer sex Challenges Positive sexuality Intimacy & relationships	CBT MI	LGBT-centered Primary Care	HIV-infected MSM
31. Disclosure Intervention [44]	United States	HIV disclosure	Talking about sex	Group discussions and disclosure exercises	Community -based	MSM Living with HIV
32. Domestic Violence Screening and Referrals [45]	Canada	Intimate partner violence	Challenges	Abuse screening interview and referral if patients indicated safety concerns	Primary care	People Living with HIV
33. Living in the Face of Trauma (LIFT) [46,47]	United States	Stress and sexual abuse	Challenges	Group-delivered; cognitive appraisal and coping skills training; cognitive behavioral treatment strategies	Community -based	People living with HIV who experienced sexual abuse as a child (0–12 years) or adolescent (13–17 years)

Intervention name & Reference	OECD Country	Target psychosocial sexual health problem	Sexual Health Model dimension	Characteristics	Setting	Participants
34. Positive Choices [6,48]	United States	Risk behaviour HIV disclosure	Talking about sex Sexual health care & safer sex	Based on IMB skills model and the Transtheoretical model; three-session intervention	LGBT-centered Primary Care	High-risk MSM who were diagnosed with HIV diagnosis within the past three months
35. Couples HIV testing and counseling (CHTC) [49]	United States	HIV risks Sexual agreements, Intimate partner violence	Talking about sex Sexual health care & safer sex Challenges Intimacy & relationships	CHTC adapted to MSM	Community -based	Male Couples
36. Enhanced Sexual Health Intervention for Men (ES-HIM) [50,51]	United States	Unwanted or forced sexual contact Sexual behaviour Sexual risk HIV stigma and homophobia Sexual ownership Culture, religion and sexuality Child sexual abuse and trauma	Culture & sexual identity Sexual health care & safer sex Challenges Positive sexuality Spirituality	Six, 2-hour small-group sessions, guided by cognitive-behavioral approaches and an ecological framework	Community -based	HIV-positive African American men who have sex with men and women, who did not self-identify as gay, with a history of child sexual abuse
37. Connect with Pride [52]	United States	Risk behaviour and condom use Substance use Relationships Couple communication stigma	Talking about sex Culture & sexual identity Sexual health care & safer sex Challenges Intimacy & relationships	Guided by SCT and a relationship-oriented ecological perspective. 90-minute sessions delivered by a facilitator to a single couple	Community -based	Methamphetamine-using, black MSM couples at elevated risk for sexual transmission of HIV/STIs

Note. CBT = Cognitive Behavioural Therapy. CHTC = Couples HIV testing and counseling. GBM = Gay, Bisexual, and other Men who Have sex with Men. IBM = Information, Behavioural, Motivation. LGBT = Lesbian, Gay, Bisexual, Transgender. MI = Motivational Interviewing. MSM = Men who have Sex with Men. SCT = Social Cognitive Theory. STI = Sexually Transmitted Infection. Organisation for Economic Co-operation and Development.

REFERENCES

1. Achterbergh RCA, van der Helm JJ, van den Brink W, de Vries HJC. Design of a syndemic based intervention to facilitate care for men who have sex with men with high risk behaviour: the syn.bas.in randomized controlled trial. BMC Infect Dis. 2017;17(1):398; https://doi.org/10.1186/s12879-017-2474-x

2. Achterbergh RCA, van Rooijen MS, van den Brink W, Boyd A, de Vries HJC. Enhancing help-seeking behaviour among men who have sex with men at risk for sexually transmitted infections: the syn.bas.in randomised controlled trial. Sex Transm Infect. 2021;97(1):11-17; https://doi.org/10.1136/sextrans-2020-054438
3. Adam BD, Murray J, Ross S, Oliver J, Lincoln SG, Rynard V. hivstigma.com, an innovative web-supported stigma reduction intervention for gay and bisexual men. Health Educ Res. 2011;26(5):795-807; https://doi.org/10.1093/her/cyq078
4. Alvarado BE, Martinez-Cajas JL, Mueses HF, Correa Sanchez D, Adam BD, Hart TA. Adaptation and Pilot Evaluation of an Intervention Addressing the Sexual Health Needs of Gay Men Living with HIV Infection in Colombia. Am J Mens Health. 2021;15(1):1557988321989916; https://doi.org/10.1177/1557988321989916
5. Bachmann LH, Grimley DM, Gao H, et al. Impact of a computer-assisted, provider-delivered intervention on sexual risk behaviors in HIV-positive men who have sex with men (MSM) in a primary care setting. AIDS Educ Prev. 2013;25(2):87-101; https://doi.org/10.1521/aeap.2013.25.2.87
6. Pachankis JE, Safren SA, Harkness A, Safren SA. Evidence-Based Approaches to HIV-Positive Sexual Minority Men's Sexual Health. *Handbook of Evidence-Based Mental Health Practice with Sexual and Gender Minorities*. New York, NY: Oxford University Press; US; 2019:339-358.
7. Horvath KJ, Hirshfield S. "Poz" in the Age of Technology: Technology, Sex, and Interventions to Reduce Risk for HIV Positive Men Who Have Sex with Men. *Understanding Prevention for HIV Positive Gay Men*2017:367-395.
8. Blashill AJ, Safren SA, Wilhelm S, et al. Cognitive behavioral therapy for body image and self-care (CBT-BISC) in sexual minority men living with HIV: A randomized controlled trial. Health Psychol. 2017;36(10):937-946; https://doi.org/10.1037/hea0000505
9. Klimek P, Wilhelm S, Safren SA, Blashill AJ. Cognitive Behavioral Therapy for Body Image and Self-Care (CBT-BISC) among Sexual Minority Men Living with HIV: Skills-Based Treatment Mediators. Cognit Ther Res. 2020;44(1):208-215; https://doi.org/10.1007/s10608-019-10035-w
10. Lamb KM, Nogg KA, Safren SA, Blashill AJ. Mechanism of Change in Cognitive Behavioral Therapy for Body Image and Self-Care on ART Adherence Among Sexual Minority Men Living with HIV. Aids Behav. 2018;22(8):2711-2717; https://doi.org/10.1007/s10461-018-2143-0
11. Brown JL, Vanable PA, Bostwick RA, Carey MP. A Pilot Intervention Trial to Promote Sexual Health and Stress Management Among HIV-Infected Men Who Have Sex with Men. Aids Behav. 2019;23(1):48-59; https://doi.org/10.1007/s10461-018-2234-y
12. Carlsson-Lalloo E, Rusner M, Berg M, Svedhem V, Mellgren A. People living with HIV in Sweden report high levels of sexual satisfaction in a registry-based cohort study. AIDS Care. 2022;34(5):559-567; https://doi.org/10.1080/09540121.2021.1909698
13. Cruess DG, Burnham KE, Finitsis DJ, et al. A Randomized Clinical Trial of a Brief Internet-based Group Intervention to Reduce Sexual Transmission Risk Behavior Among HIV-Positive Gay and Bisexual Men. Ann Behav Med. 2018;52(2):116-129; https://doi.org/10.1093/abm/kax031

14. Feldman MB, Torino JA, Swift M. A group intervention to improve body image satisfaction and dietary habits in gay and bisexual men living with HIV/AIDS. Eat Disord. 2011;19(5):377-391; https://doi.org/10.1080/10640266.2011.609084
15. Flentje A. AWARENESS: Development of a cognitive-behavioral intervention to address intersectional minority stress for sexual minority men living with HIV who use substances. Psychotherapy (Chic). 2020;57(1):35-49; https://doi.org/10.1037/pst0000243
16. Graber LS. Not a victim: How self-deception saved David. J Clin Psychol. 2020;76(2):258-265; https://doi.org/10.1002/jclp.22892
17. Haas SM, Perazzo JD, Ruffner AH, Ancona RM, Lyons M. The Know *Now Project: Facilitated Serosorting in HIV-Status Sexual Partner Communication. AIDS Educ Prev. 2017;29(5):432-442; https://doi.org/10.1521/aeap.2017.29.5.432
18. Haas SM, Perazzo JD, Ruffner AH, Ancona RM, Lyons M. Erratum. AIDS Educ Prev. 2018;30(2):183; https://doi.org/10.1521/aeap.2018.30.2.183
19. Hart TA, Willis AC, Simpson SH, et al. Gay Poz Sex: A Sexual Health Promotion Intervention for HIV-Positive Gay and Bisexual Men. Cognitive and Behavioral Practice. 2016;23(4):517-529; https://doi.org/10.1016/j.cbpra.2015.11.002
20. Hart TA, Noor SW, Skakoon-Sparling S, et al. GPS: A Randomized Controlled Trial of Sexual Health Counseling for Gay and Bisexual Men Living With HIV. Behav Ther. 2021;52(1):1-14; https://doi.org/10.1016/j.beth.2020.04.005
21. Hart TA, Stratton N, Coleman TA, et al. A Pilot Trial of a Sexual Health Counseling Intervention for HIV-Positive Gay and Bisexual Men Who Report Anal Sex without Condoms. PLoS One. 2016;11(4):e0152762; https://doi.org/10.1371/journal.pone.0152762
22. Herder T, Agardh A. Navigating between rules and reality: a qualitative study of HIV positive MSM's experiences of communication at HIV clinics in Sweden about the rules of conduct and infectiousness. AIDS Care. 2019;31(10):1304-1310; https://doi.org/10.1080/09540121.2019.1566590
23. Hirshfield S, Chiasson MA, Joseph H, et al. An online randomized controlled trial evaluating HIV prevention digital media interventions for men who have sex with men. 2012;
24. Conserve DF, Groves AK, Maman S. Effectiveness of interventions promoting HIV serostatus disclosure to sexual partners: a systematic review. Aids Behav. 2015;19(10):1763-1772; https://doi.org/10.1007/s10461-015-1006-1
25. Illa L, Echenique M, Jean GS, et al. Project ROADMAP: Reeducating Older Adults in Maintaining AIDS Prevention: a secondary intervention for older HIV-positive adults. AIDS Educ Prev. 2010;22(2):138-147; https://doi.org/10.1521/aeap.2010.22.2.138
26. Kalokhe AS, Paranjape A, Bell CE, et al. Intimate partner violence among HIV-infected crack cocaine users. AIDS Patient Care STDS. 2012;26(4):234-240; https://doi.org/10.1089/apc.2011.0275
27. Klein CH, Kuhn T, Huxley D, Kennel J, Withers E, Lomonaco CG. Preliminary Findings of a Technology-Delivered Sexual Health Promotion Program for Black Men Who Have Sex With Men: Quasi-Experimental Outcome Study. JMIR Public Health Surveill. 2017;3(4):e78; https://doi.org/10.2196/publichealth.7933
28. Klein C, Lomonaco C. Real Talk: Developing a Computer-Delivered Sexual Health Program for Black Men Who Have Sex With Men. AIDS Educ Prev. 2016;28(6):455-471; https://doi.org/10.1521/aeap.2016.28.6.455

29. Koblin BA, Bonner S, Powell B, et al. A randomized trial of a behavioral intervention for black MSM: the DiSH study. Aids. 2012;26(4):483-488; https://doi.org/10.1097/QAD.0b013e32834f9833
30. Kurtz SP, Stall RD, Buttram ME, Surratt HL, Chen M. A randomized trial of a behavioral intervention for high risk substance-using MSM. Aids Behav. 2013;17(9):2914-2926; https://doi.org/10.1007/s10461-013-0531-z
31. Buttram ME, Kurtz SP. A Qualitative Study of African American/Black MSM's Experiences of Participating in a Substance Use and Sexual Risk Reduction Intervention. Am J Mens Health. 2017;11(4):1155-1161; https://doi.org/10.1177/1557988315584157
32. Lin X, Mattson CL, Freedman M, Skarbinski J, Medical Monitoring P. Erectile Dysfunction Medication Prescription and Condomless Intercourse in HIV-Infected Men Who have Sex with Men in the United States. Aids Behav. 2017;21(4):1129-1137; https://doi.org/10.1007/s10461-016-1552-1
33. Lovejoy TI, Heckman TG. Depression moderates treatment efficacy of an HIV secondary-prevention intervention for HIV-positive late middle-age and older adults. Behav Med. 2014;40(3):124-133; https://doi.org/10.1080/08964289.2014.893982
34. Lovejoy TI, Heckman TG, Suhr JA, Anderson T, Heckman BD, France CR. Telephone-administered motivational interviewing reduces risky sexual behavior in HIV-positive late middle-age and older adults: a pilot randomized controlled trial. Aids Behav. 2011;15(8):1623-1634; https://doi.org/10.1007/s10461-011-0016-x
35. Lyons T, Tilmon S, Fontaine Y-M. Development of a Small-Group Intervention for Stimulant-Using Men Who Have Sex With Men. Journal of Groups in Addiction & Recovery. 2014;9(1):54-70; https://doi.org/10.1080/1556035x.2014.868724
36. McKirnan DJ, Tolou-Shams M, Courtenay-Quirk C. The Treatment Advocacy Program: a randomized controlled trial of a peer-led safer sex intervention for HIV-infected men who have sex with men. J Consult Clin Psychol. 2010;78(6):952-963; https://doi.org/10.1037/a0020759
37. Nostlinger C, Platteau T, Bogner J, et al. Implementation and Operational Research: Computer-Assisted Intervention for Safer Sex in HIV-Positive Men Having Sex With Men: Findings of a European Randomized Multi-Center Trial. J Acquir Immune Defic Syndr. 2016;71(3):e63-72; https://doi.org/10.1097/QAI.0000000000000882
38. Parsons JT, Rendina HJ, Moody RL, Gurung S, Starks TJ, Pachankis JE. Feasibility of an Emotion Regulation Intervention to Improve Mental Health and Reduce HIV Transmission Risk Behaviors for HIV-Positive Gay and Bisexual Men with Sexual Compulsivity. Aids Behav. 2017;21(6):1540-1549; https://doi.org/10.1007/s10461-016-1533-4
39. Reisner SL, O'Cleirigh C, Hendriksen ES, et al. "40 & Forward": Preliminary Evaluation of a Group Intervention to Improve Mental Health Outcomes and Address HIV Sexual Risk Behaviors Among Older Gay and Bisexual Men. Journal of Gay & Lesbian Social Services. 2011;23(4):523-545; https://doi.org/10.1080/10538720.2011.611113
40. Rosser SBR, Oakes JM, Konstan J, et al. Reducing HIV risk behavior of men who have sex with men through persuasive computing: results of the Men's INTernet Study-II. Aids. 2010;24(13):2099-2107;

41. Simon Rosser B, Hatfield LA, Miner MH, Ghiselli ME, Lee BR, Welles SL. Effects of a behavioral intervention to reduce serodiscordant unsafe sex among HIV positive men who have sex with men: The positive connections randomized controlled trial study. Journal of Behavioral Medicine. 2010;33(2):147-158; https://doi.org/https://dx.doi.org/10.1007/s10865-009-9244-1
42. Safren SA, O'Cleirigh C, Skeer MR, et al. Demonstration and evaluation of a peer-delivered, individually-tailored, HIV prevention intervention for HIV-infected MSM in their primary care setting. AIDS and Behavior. 2011;15(5):949-958;
43. Safren SA, O'Cleirigh CM, Skeer M, Elsesser SA, Mayer KH. Project enhance: a randomized controlled trial of an individualized HIV prevention intervention for HIV-infected men who have sex with men conducted in a primary care setting. Health Psychology. 2013;32(2):171;
44. Serovich JM, Laschober TC, Brown MJ, Kimberly JA. Evaluation of HIV Disclosure Behavior Following a Randomized Controlled Disclosure Intervention for Men Who Have Sex with Men Living with HIV. Arch Sex Behav. 2018;47(7):2051-2059; https://doi.org/10.1007/s10508-017-1055-9
45. Siemieniuk RA, Krentz HB, Gish JA, Gill MJ. Domestic violence screening: prevalence and outcomes in a Canadian HIV population. AIDS Patient Care STDS. 2010;24(12):763-770; https://doi.org/10.1089/apc.2010.0235
46. Sikkema KJ, Ranby KW, Meade CS, Hansen NB, Wilson PA, Kochman A. Reductions in traumatic stress following a coping intervention were mediated by decreases in avoidant coping for people living with HIV/AIDS and childhood sexual abuse. Journal of consulting and clinical psychology. 2013;81(2):274;
47. van der Heijden I, Abrahams N, Sinclair D. Psychosocial group interventions to improve psychological well-being in adults living with HIV. Cochrane Database Syst Rev. 2017;3(3):CD010806; https://doi.org/10.1002/14651858.CD010806.pub2
48. Sikkema KJ, Abler L, Hansen NB, et al. Positive choices: outcomes of a brief risk reduction intervention for newly HIV-diagnosed men who have sex with men. Aids Behav. 2014;18(9):1808-1819; https://doi.org/10.1007/s10461-014-0782-3
49. Sullivan PS, White D, Rosenberg ES, et al. Safety and acceptability of couples HIV testing and counseling for US men who have sex with men: a randomized prevention study. J Int Assoc Provid AIDS Care. 2014;13(2):135-144; https://doi.org/10.1177/2325957413500534
50. Williams JK, Glover DA, Wyatt GE, Kisler K, Liu H, Zhang M. A sexual risk and stress reduction intervention designed for HIV-positive bisexual African American men with childhood sexual abuse histories. Am J Public Health. 2013;103(8):1476-1484; https://doi.org/10.2105/AJPH.2012.301121
51. Allen VC, Myers HF, Williams JK. Depression among Black bisexual men with early and later life adversities. Cultur Divers Ethnic Minor Psychol. 2014;20(1):128-137; https://doi.org/10.1037/a0034128
52. Wu E, El-Bassel N, McVinney LD, et al. Feasibility and promise of a couple-based HIV/STI preventive intervention for methamphetamine-using, black men who have sex with men. Aids Behav. 2011;15(8):1745-1754; https://doi.org/10.1007/s10461-011-9997-8

Table 3. Implementation barriers and facilitators of the sexual health interventions

	n*	%†
Characteristics of the intervention		
Barriers	17	41
Limited effectiveness	10	24
Characteristics of the instruments	4	10
Excessive duration	3	7
Cost	2	5
Facilitators	32	78
Effectiveness	17	41
Acceptability	13	32
Feasibility	10	24
Characteristics of the individuals involved		
Barriers	15	37
Participant characteristics	14	34
Provider characteristics	6	15
Participant lack of interest	5	12
Facilitators	18	44
Participant interest and satisfaction	8	20
Provider expertise	6	15
Patient-provider relationship	5	12
Other participant characteristics	3	7
Inner Setting		
Barriers	7	17
Time and resource constraints	6	15
Sparse follow-up visits	1	2
Facilitators	6	15
Clinic characteristics	5	12
Supportive environment	1	2
Outer Setting		
Barriers	5	12
Structural issues	3	7
Lack of integration between services	2	5
Facilitators	4	10
Ease of dissemination	2	5
Availability of referrals	1	2
Generalizability	1	2
Implementation Process		
Barriers	0	0
Facilitators	2	5
Advertising and promotion	1	2

Short duration	1	2

Note. *Number of documents mentioning a given dimension out of 41.
†Percentage of documents addressing a given dimension.

Sexual Health Model Dimension	Intervention*																																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	%†
1. Talking About Sex	●	●	●	●		●		●						●	●	●		●		●			●	●	●		●	●	●	●	●			●	●		●	59
2. Culture & Sexual Identity	●	●								●		●						●	●	●		●	●			●			●	●						●	●	38
3. Sexual Anatomy Functioning																					●								●									5
4. Sexual Health Care & Safer Sex	●	●	●	●		●		●					●		●	●		●	●	●	●	●	●	●	●	●	●	●	●	●				●	●	●	●	70
5. Challenges	●		●							●	●	●	●				●	●	●	●		●	●	●	●	●		●	●	●		●	●		●	●	●	62
6. Body Image					●				●																			●	●										11
7. Masturbation & Fantasy																													●									3
8. Positive Sexuality						●	●						●						●	●		●		●	●				●	●						●		30
9. Intimacy & Relationships			●										●					●		●		●		●	●			●	●	●					●		●	32
10. Spirituality																												●	●							●		8
Total (/10)	4	3	4	2	1	3	1	2	1	2	1	2	4	1	2	2	1	5	4	6	2	5	4	5	5	3	2	6	10	6	1	1	1	2	4	5	5	

Supplemental Table 1. Dimensions of Robinson's Sexual Health Model addressed by interventions.

Note. Each dot represents the presence of the dimension addressed in a specific intervention. *Number assigned to the intervention, as in Table 2. †Percentage of interventions addressing a given dimension.