AIDS and Behavior (2019) 23:259–271
https://doi.org/10.1007/s10461-018-2212-4

ORIGINAL PAPER

Sexual Agreements: A Scoping Review of Measurement, Prevalence and Links to Health Outcomes

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Published online: 29 June 2018

Abstract

A sexual agreement is a mutual understanding between two partners regarding sexual and relational behaviors both within and outside of their relationship. Sexual agreements have been central to research and programming efforts around HIV prevention, primarily for male couples. A comprehensive scoping review of the primary literature on sexual agreements, including negotiated safety, was performed to identify what is known about sexual agreements among couples (n = 66). Results indicate a wide range of prevalence of agreements and measurements used to characterize sexual agreements. Findings also report associations between sexual agreements and health and relational outcomes. Several knowledge gaps were identified; specifically, the need to expand sexual agreements research beyond MSM populations and the need to better understand agreement breaks, break disclosure, and how variation in agreement categorization may impact reported prevalence. This review demonstrates the importance of broadening the evidence-base of sexual agreements research and programmatic focus.

Keywords Couples · Sexual agreements · Negotiated safety

Introduction

Recent research has drawn attention to the role of male dyads in the U.S. HIV epidemic, with primary male partners identified as the source of approximately one-third [1] to two-thirds [2] of new HIV infections. The identification of being in a partnership as an important risk for HIV infection among men who have sex with men (MSM) represents a significant paradigm shift in HIV prevention thinking. Prevention efforts have traditionally focused on MSM as individuals and have messaged the HIV risks associated with casual sex [3]. Recent research findings have illustrated high rates of sexual risk behavior for HIV (with primary and casual partners), low rates of disclosure of potentially risky episodes with casual partners to primary partners, and reduced frequency of HIV testing among male couples [4–6]. In addition, intimate relationships may convey a misplaced sense of protection, to some degree created by the historical prevention focus on reducing numbers of sexual partners.

Central to research and programming efforts around HIV prevention for male couples has been a focus on sexual agreements. A sexual agreement is a mutual understanding between two partners regarding sexual and relational behaviors both within and outside of their relationship [7, 8]. Types of sexual agreements are mostly described as either open (allowing sex with outside partners) or closed (not allowing sex with outside partners), often referred to as monogamous. An open agreement may further be defined as open with or without rules or conditions. Rules refer to clearly defined parameters for the agreement, that may include condom use, types of sex allowed, or may be linked to HIV/STI testing behavior [9]. A specific form of sexual agreement that has received much research attention is negotiated safety, in which sero-concordant HIV-negative

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partners in a committed relationship agree to use condoms for anal intercourse outside of the relationship but not within the relationship [10].

There is now a wealth of evidence demonstrating the high prevalence of sexual agreements among male couples, with recent studies estimating that 58 to 99% percent of male couples report having a sexual agreement with their primary male partner [7, 11]. The most commonly reported agreement is a closed agreement (monogamy), with a prevalence between 13 and 82% [11, 12] compared to open agreements, which range in prevalence from 2 to 64% [13, 14]. There is also increasing evidence of associations between sexual agreement formation and HIV risk and prevention behaviors. Couples with closed agreements have lower odds of engaging in condomless anal intercourse with an outside partner when compared to couples with an open agreement [15–18]. However, the formation of sexual agreements has also been associated with other HIV risk behaviors: couples with an open agreement are more likely to use alcohol and drugs during sex [19]. Furthermore, while some couples will form sexual agreements on their own over the course of their relationships, without health protective models such agreements may not reduce risk. In one study which compared types of agreements (e.g., open, closed, negotiated safety), researchers found that some agreements were unsafe—that is, agreements permitted high risk sexual behavior such as condomless anal sex both within and outside the partnership [16]. Another study found that, among sero-discordant couples, partners formed and adhered to sexual agreements without intervention but nearly half of agreements did not incorporate HIV protective strategies such as condom use [20]. The formation of sexual agreements is also related to HIV prevention behaviors. Two recent studies demonstrated that couples with an open agreement were more likely to have been tested for HIV recently [21, 22], suggesting that the formation of an agreement may provide parameters for also discussing and partaking in HIV prevention activities. However, associations between sexual agreement formation and HIV prevention and risk go beyond just the presence of agreements: the amount of investment, commitment and satisfaction with the agreement reported by the couples are also significantly associated with the breakage of agreements, condomless sex outside of the partnership and HIV testing behaviors [14, 15, 17, 18, 23–29]. Considering that many male couples form sexual agreements and are willing to discuss sexual risk behavior with their partners [30], an understanding of agreement formation and differences in outcomes across types of agreements may be beneficial to inform the content of programmatic efforts to reduce HIV transmission within male dyads.

Despite growing research attention to sexual agreements, such attention has remained largely focused on male couples, with a dearth of research examining sexual agreements in other populations (e.g., couples in which one or both members are transgender or opposite gender couples). This scoping review aims to fill several gaps in our current understanding of the evidence-base for sexual agreements. First, the review is not limited to research on male couples, and includes and contrasts research examining sexual agreements among couples of all gender and sexual identities. The review is also not limited to studies that have focused on HIV risk or prevention outcomes, and rather includes studies that have examined any physical or mental health outcome, or any relationship characteristic outcome. The scoping review builds and extends upon previous reviews that have focused either only on male couples [31] or focused only on negotiated safety [32]. Fundamental to the development of dyadic HIV prevention interventions that incorporate sexual agreement discussions or formations is a thorough understanding of the current status of evidence for sexual agreements. This scoping review aims to provide this evidence by providing an evaluation of what is currently known about sexual agreements, with the aim of identifying gaps in research and presenting recommendations for future research foci.

Methods

Aims

Research objectives, inclusion criteria, and methods for this review were determined in advance in accordance with The Joanna Briggs Institute Reviewers' Manual 2015 Methodology for JBI Scoping Reviews. The process adhered to the following guidelines: (1) identify the research question, (2) identify relevant studies, (3) develop a comprehensive search strategy, (4) study selection, (5) chart the data, and (6) collate, summarize, and report the results. The objective of this scoping review was to develop a better understanding of the current landscape of sexual agreements research by investigating existing studies and identifying gaps in the research. The broad research questions were, "*What is known about sexual agreements among couples?*" and "*what gaps in the current knowledge-base of sexual agreements can inform future research directions*?" A search strategy was created to capture as many articles as possible within the search criteria, using methods outlined by the 2015 Methodology for JBI Scoping Reviews.

Search Method

Working with an informationist from the Taubman Health Sciences Library at the University of Michigan, a search strategy was developed based on the search terms "sexual agreements" in PubMed. After reviewing the titles and

abstracts of initial relevant search results, the strategy was revised to include the additional search terms, "relationship agreements" and "negotiated safety." The informationist translated the PubMed search strategy for five additional databases: CINAHL, PsycINFO, LGBT Life, Embase, and Scopus. The search was limited to peer-reviewed publications and English-language with no limit on publication date. Grey literature and conference proceedings were not included in the search protocol and appropriate filters were applied where possible within each search. The final set of citations was exported into a shared Refworks account.

Search Outcome

The combined database searches yielded 399 records, of which 274 were duplicate records and were removed prior to the review. The title and abstract review examined 125 records in total. After establishing inclusion criteria, records from the database were reviewed by title and abstract. Criteria for the title and abstract review included: peer-reviewed article publication, published in English, and paper was a quantitative or qualitative study. Out of 125 articles, 49 were excluded due to non-relevance to review. Remaining articles (n = 76) were included in a full text review. Articles were excluded if they were theoretical papers, grey papers, dissertations, briefs, literature reviews, had an ambiguous definition of the term "negotiated safety," or where full text was not available. Articles where sexual agreements or negotiated safety was only addressed in the introduction and not a measure, aim, or associated with an outcome were also excluded. Out of 76 articles, 18 were excluded for not meeting inclusion criteria of the review.

In addition to searching databases, the reference list of two systematic literature reviews that had relevant overlap with the research question and objectives were also searched. Unique citations were included if they matched the search protocol for electronic databases. This yielded an additional 39 records. These articles were included in a full text review with the same inclusion and exclusion criteria as database records. Of those, 8 articles were included among the total included in this review for a final total of 66 articles (Fig. 1).

To manage the data, an electronic spreadsheet was created. The table contained the following information: title of the study with first author and year published; study location; study design; description of methodology; description of study sample; definition of sexual agreements or negotiated safety; prevalence of type of agreement; measurements and scales used; measurement of satisfaction with sexual agreement; measurement of reasons for creating sexual agreements or negotiated safety; and links between agreements and outcomes.

Results

Of the final sixty-six studies included in this review, thirty-eight included unique data sets. Forty-eight of the studies were quantitative, twelve were qualitative, and six employed mixed-methods strategies. The majority of studies took place in the United States (US) (n = 44) followed by: Australia (n = 10), the Netherlands (n = 4), Canada (n = 2), multi-country (n = 2), Portugal (n = 1), Germany (n = 1), UK (n = 1).

All studies were conducted in high-income countries, with forty-one that recruited participants from urban areas. Thirteen studies recruited exclusively from San Francisco, seven recruited from Atlanta, and four recruited from Sydney. One study specifically looked at populations in towns or small cities with a population of < 100,000 [33]. Most studies published before 2010 focused specifically on negotiated safety (n = 10), with only three studies on sexual agreements published before 2010 [34–36]. Ten studies focused exclusively on negotiated safety, with most being conducted prior to 2010. Among the studies reviewed, only one compared negotiated safety to other kinds of agreements and found that negotiated safety agreements were the types most likely to be kept (93% kept the agreement) [16].

There were several instances of multiple studies using the same dataset. The following samples were analyzed in multiple publications: n = 566 MSM couples in San Francisco [7, 25, 37–39]; n = 142 MSM couples in Portland and Seattle [15, 17, 18, 27, 40]; n = 29 MSM couples in Atlanta and Detroit [8, 41–43]; n = 361 MSM couples in the US, recruited through Facebook [19, 24, 28, 30, 44, 45]; n = 161 MSM couples in Los Angeles and New York City [46, 47]; n = 906 MSM couples recruited on Facebook [21, 22]; n = 39 MSM couples in San Francisco [14, 48]; n = 685 gay male participants in Australia [9, 49]; and n = 435 gay male participants in Amsterdam [50, 51].

Study Characteristics

Recruitment

Studies used a variety of recruitment strategies. Twenty-seven studies used some form of active and/or passive recruitment, which included: handing out postcards, approaching potential participants at community events, placing recruitment materials at social venues and community health organizations, placing advertisements in print and online publications, recruitment through email listservs, personal and organization websites, and/or radio station ads. Recruitment strategies also included: referrals

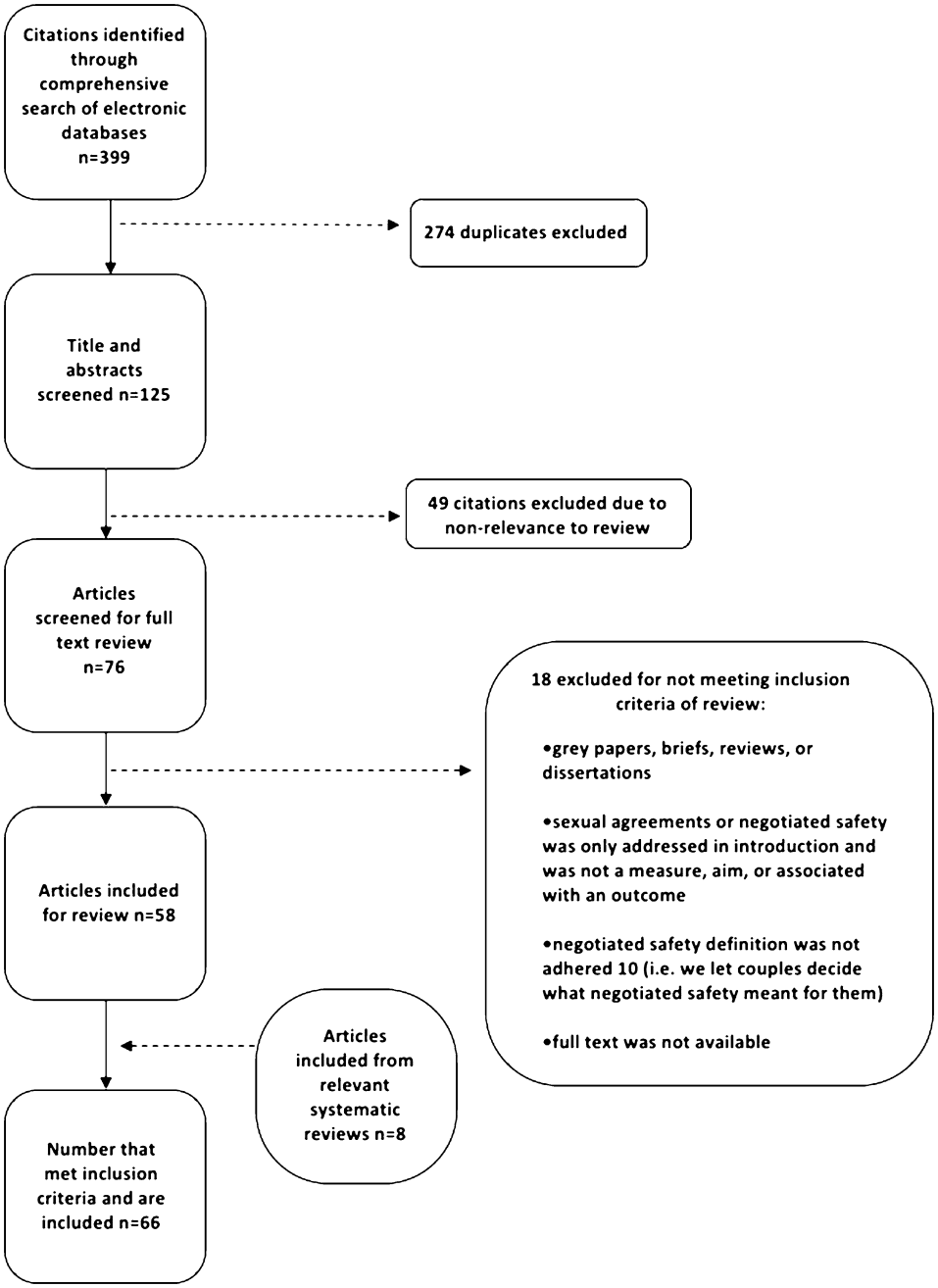

Fig. 1 Sexual agreement review screening process

from medical practitioners or community health organizations (n = 11), Facebook banner advertisements (n = 7), dating website advertisements (n = 5), recruiting patients from previous studies (n = 11), chain referral (n = 13), and one study used random digit dialing [13].

Participant Characteristics

Participant characteristics varied widely across studies. Forty-eight studies required participants to be at least 18 years of age with one exception which required participants to be at least 16 [13]. Four studies restricted participants to under 35 years of age [11, 50–52], and three studies restricted their samples to participants where at least one partner was between 18 and 25 years old [29, 53, 54]. Fifty-six studies recruited cis male participants. Fifty-five studies focused on self-identified gay, bisexual, or queer males (n = 11) or MSM participants (n = 44) and only recruited from sites that serve gay/MSM populations. Three studies excluded self-identified bisexual participants and recruited only self-identified gay males [9, 49, 55]. Seven studies recruited exclusively self-identified heterosexual

participants or those currently in a heterosexual relationship [13, 23, 29, 56–59]. One study recruited both self-identified heterosexual and LGB participants [12].

Nine studies included both cis gender female and cis gender male participants [12, 13, 23, 29, 54, 57–60]. Two studies exclusively recruited trans women and their cis male romantic partners [11, 61] and one study exclusively recruited cis female participants [56].

Eligibility Criteria

Thirty-nine studies had eligibility criteria that required participants be in a current relationship, but these studies varied in specific relationship status requirements. Some eligibility criteria required participants to have been in a relationship for at least 3 months (n = 10) [7, 14, 15, 25, 27, 28, 38–40, 48], seven studies for at least 6 months [8, 41–43, 55, 62, 63], and three studies for at least 12 months [64–66]. Finally, some eligibility criteria did not specify a length of time but stated that participants must be in a "serious" relationship [53, 54], a cohabiting relationship [63, 64], or a "long lasting romantic relationship" [23]. Seven studies recruited participants that had a Facebook relationship status of "in a relationship, married, or engaged" [19, 24, 28, 30, 44, 45, 67]. Thirty-one studies reported procedures that required participation from both members of a dyad. [7, 8, 14, 15, 17, 18, 20, 25, 27, 29, 34, 37–43, 48, 53, 54, 61, 64, 67, 68]. Seven studies prompted couple participation but did not require it for eligibility [19, 24, 28, 30, 44, 45, 58]. One study advised participants to refrain from discussing participation in the study with their current partners [55].

Six studies required that participants had knowledge of their own and their partners' HIV status [7, 14, 25, 38, 39, 48]. Ten studies excluded participants that were HIV-positive [8, 15, 17, 18, 27, 40–43, 67], and four studies recruited patients that were self-reported HIV-positive or had a partner who was HIV-positive [20, 34, 35, 60].

Reported recent sexual behavior was included in most samples' eligibility criteria. Five studies that focused on MSM or gay men had eligibility criteria that required participants to have had anal intercourse in the previous 3 months [15, 17, 18, 27, 40]. One study specified that participants were only eligible if they had engaged in unprotected anal intercourse (UAI) within the previous 3 months [69] and four studies specified within the previous 6 months [8, 41–43]. Thirteen studies only specified that male participants had to have been sexually active with a male, regardless of self-identified sexual orientation or specific sexual behavior. Of these studies, there were several which restricted the time within which participants had to have engage in sexual contact to be eligible: 6 months (n = 5) [50–52, 59, 66], 12 months (n = 5) [57, 60, 62, 65, 70], five years (n = 2) [71, 72], and at the time of their most recent HIV test (n = 1) [73]. Sexual behavior was also a specified eligibility criterion for studies that recruited female participants or males who had female sexual partners. One study exclusively recruited males who had sex with males and also currently had a female sexual partner [33]. Another study recruited participants who had engaged in high-risk sexual behavior with partners of the opposite sex [29]. Only one study specified a time restriction that participants had to have had sex with an opposite sex partner in the previous 6 months [59].

Among studies conducted in the US (n = 44), all studies required participants to read and speak English with one exception. One study required that participants be Spanish speakers [68]. Two studies exclusively recruited self-identified Latino/a participants [29, 68].

Only a few studies included agreement restrictions in their eligibility criteria. Specifically, four studies recruited participants that had formed and kept a sexual agreement for at least 6 months [8, 41–43].

Data Collection

Online access to confidential surveys was the most frequently used method of data collection (n = 20) [11, 12, 19, 21–24, 26, 28, 30, 33, 44, 45, 55, 57, 58, 62, 63, 65, 66] or collected data through Computer-Assisted Self Interview (CASI) (n = 12) [7, 14, 25, 29, 34, 37–39, 53, 54, 61, 67]. Other strategies included: semi-structured individual-level interviews (n = 12) [8, 14, 20, 29, 34, 41–43, 48, 68, 69, 71], self-administered questionnaires (n = 16) [9, 15, 17, 18, 27, 36, 40, 46, 47, 49–52, 56, 73, 74], interviewer-administered questionnaires (n = 4) [10, 29, 70, 72], telephone interviews (n = 4) [13, 16, 60, 71], couple-level semi-structured interviews (n = 2) [53, 54], focus groups [59], tablet-based survey [60], relationship diaries [69], and process tracing [35]. Two studies gave participants an HIV test on site [50, 67].

Measurements

Sexual Agreements

Forty-three studies categorized agreement types as a binary of "closed/monogamous" or "open/non monogamous." Definitions of monogamy varied somewhat, with the most common definition being that both partners do not allow sex with outside partners (n = 38). One study divided monogamy into separate categories of "implicit" monogamy (i.e., "without talking about it, you and your partner just know you are monogamous.") and "explicit" monogamy (i.e., "you and your partner have actually discussed that you both will be monogamous"), dependent on how the agreement was reached [33]. Other terms used to

describe sexually exclusive agreements included "exclusive," and "SMR" (sexually monogamous relationship) [23].

Studies diverged in how they defined and analyzed open agreements. The two most common definitions differed in how "open" was categorized. In twenty-two studies, "open agreement," was dichotomous. Couples either agreed to allow sex outside of the relationship with restrictions/guidelines, or, extra dyadic sex was allowed without restrictions/guidelines and considered a distinct category [9–12, 14, 17, 18, 23, 26, 27, 33, 34, 36, 44, 49, 53, 55, 57, 60, 62, 63, 67]. Twenty-eight studies grouped any form of open agreement as a single type of agreement [7, 8, 15, 19, 21, 22, 24, 25, 29, 30, 35, 37–43, 45–48, 58, 61, 64–66, 68]. Eight studies included subcategories of open agreements that were described in other ways. This included: "monogamish" or threesome only [9, 49, 55], sexually open but emotionally exclusive [68]; "swingers" [59]; "regular plus casual relationships" or "several relationships at one time," [10], "polyamorous" [12], no sex at all; no anal sex; all anal sex with a condom; all anal sex without a condom" [36]. Eleven studies included "no agreement" as a distinct type of agreement [21, 26, 53, 60–63, 66–68], with one study characterizing "no agreement" as a kind of open agreement [61]. Four studies allowed participants to define an open agreement for themselves or otherwise indicated a non-specific definition of an open agreement. Such definitions included "fluid" agreements [69] and "open to some degree" (n = 3) [15, 40, 64].

Eight studies also included discrepant agreements, where partners report little to no overlap in relationship guidelines, as a specific type of agreement [7, 25, 37–39, 48, 61, 67]. One study included agreements with a "just-in-case clause" [68]. Five studies reported that participants had a sexual agreement but did not specify type of agreement [20, 25, 28, 39, 69]. One study only analyzed data of participants with open agreements [9], and one study only included participants with monogamous agreements [29].

Prevalence of Sexual Agreements

Fifty-five studies reported agreement type prevalence as a percentage or number of participants and the rest did not report prevalence (n = 10) [25, 30, 37–40, 54, 59, 69, 74]. Among the studies that reported prevalence, the range of participants who had any type of sexual agreement was between 50 and 99% [7, 56]. Among those that had agreements, between 13 and 82% [11, 12] were closed or monogamous and between 2 and 64% [13, 14] were open agreements. Between 5 and 46% [48, 67] of agreements were discrepant among studies that reported this category. Finally, the range of those who reported not having an agreement at all was between 6 and 23% [21, 65].

Characteristics of Sexual Agreements

Sexual agreement explicitness, that is, if an agreement was reached through explicit discussion or through an implicit understanding, was measured across twenty studies [7, 9, 12–15, 17, 18, 20, 27, 33, 34, 37, 40, 44, 48, 57, 59, 62, 69]. Sexual agreement satisfaction was also measured, most often through the Sexual Agreement Investment Scale (n = 11) [7, 15, 17, 18, 24–28, 30, 39] though five studies measured satisfaction with an agreement through items developed for the specific study sample [9, 23, 34, 49, 55]. Other frequently measured aspects of sexual agreements include: agreement breaks (n = 19) [13, 14, 17, 19, 20, 24–27, 30, 33, 34, 38, 39, 45, 48, 55, 57, 66, 68], disclosure of agreement breaks (n = 12) [13, 17, 26, 27, 30, 33, 34, 38, 39, 48, 57, 68], agreement formation (n = 11) [8, 14, 20, 24, 43–45, 54, 55, 57, 64], changes in agreements over time (n = 4) [25, 38, 45, 72], importance of agreement aspects (n = 3) [11, 26, 34], and permitted sexual activities (n = 7) [11, 26, 30, 55, 57, 64, 66].

Sexual Risk Behavior

Fifty-three studies collected self-reported HIV status. Other HIV risk related measures include: frequency of UAI with primary partner (n = 20) [11, 15, 17, 20, 24, 25, 27, 28, 30, 36, 37, 40, 44, 45, 53, 60, 61, 64, 65, 67], UAI with outside partners, including those with an unknown HIV status (n = 25) [11, 14, 15, 18, 24, 25, 27, 28, 30, 33, 34, 36, 37, 40, 44–46, 55, 60, 61, 64–67, 69], frequency of HIV testing and reasons for testing (n = 7) [11, 21, 43, 57, 60, 67, 73], perceived HIV risk (n = 4) [20, 21, 29, 69], perceived HIV prevalence (n = 2) [21, 22], and source or circumstances of HIV infection [35]. Other measurements of sexual risk behavior and attitudes include: willingness to use PrEP [43], substance use before and during sex (n = 6) [19, 21, 29, 35, 46, 47], attitudes toward CHTC (Couples HIV Testing and Counseling) (n = 4) [57, 59, 60, 67], episodes of ejaculation inside the rectum (n = 2) [14, 20], and whether episodes of UAI were receptive or insertive (n = 6) [20, 25, 30, 37, 47, 66].

Relationship Characteristics

Among studies that measured aspects of couples' relationships, the most frequently reported is relationship length (n = 37) and cohabitation (n = 21). Several scales were used across studies and include: Rusbult's Investment Model (n = 12) [15, 17, 18, 23, 24, 27, 28, 40, 51, 53, 58, 63], Trust in Close Relationships Scale (n = 9) [7, 14, 15, 17, 18, 24, 25, 27, 30], Sternberg's Commitment Scale (n = 6) [7, 14, 24, 25, 34, 38], Rusbult's Commitment Scale (n = 3) [24, 28, 30] Triangular Love Scale (n = 3) [29, 49, 55],

Kurdek's Attachment Scale (n = 2) [7, 14], Relationship Investment Scale [53], Relationship Quality Enhancement Motivation (RQEM) [61], Couple Satisfaction Index [63], Dyadic Adjustment Scale [7, 25], Miller Social Intimacy Scale [7, 25], Kansas Marital Satisfaction [25], Marital Instability Index [63], Sexual Functioning Inventory [46], Sexual Life Enhancement Motivation (SLEM) Scale [61], Dyadic Sexual Communication Scale [46], Communication Patterns Questionnaire (n = 5) [7, 25, 28, 30, 38], Self-Report Jealousy Scale [49], Sexual Jealousy Scale [46], Monogamy Views Scale [49], Perceptions of Dating Infidelity Scale [23], Detailed Measure of Equity Scale (DME) [12], and IPV-GBM scale used to measure experiences of interpersonal violence among gay and bisexual males [21, 66]. Other aspects of relationship characteristics measured include: relationship history (n = 7) [14, 20, 53, 54, 64, 68, 69], relationship support [54], use of couples therapy [7], power in relationship decision making [39, 40], perceptions of discrepancies and benefits of open relationships [9], and importance of monogamy [11].

Negotiated Safety

Negotiated safety is a specific type of sexual agreement. For this review, articles were included if they adhered to a standard definition of negotiated safety that included: (i) participants identified a regular partner, (ii) both partners know they are HIV-negative based on an HIV test, (iii) both partners have agreed to have no UAI outside the primary relationship, and (iv) partners engage in UAI with each other. One study was included which met these definition criteria and also included couples who agreed to used condoms with each other and those who chose not engage in anal intercourse at all as part of their negotiated safety agreements [72]. Some studies compared negotiated safety agreements to "risky" agreements that fell short of the full definition of negotiated safety, such as where one or both partners did not know their HIV status before entering into an agreement.

Prevalence of Negotiated Safety Agreements

Prevalence of negotiated safety agreements was universally reported as a percentage. Among samples, the range of practicing negotiated safety was between 12 and 44% [16, 50].

Negotiated Safety Measurements

Measurements that were unique to studies which examined negotiated safety agreements included: rate of adherence to negotiated safety agreements if rule breaking disclosure was part of their negotiated safety agreement [70], attitudes towards negotiated safety [56], injunctive and descriptive social norms regarding negotiated safety [56], and self-efficacy regarding negotiated safety [56].

Reasons for Sexual Agreements

Fourteen studies reported reasons for forming a sexual agreement or a negotiated safety agreement. In general, managing expectations (n = 4) [14, 41, 42, 48], building trust or honesty (n = 4) [7, 44, 48, 53] and protecting the relationship and partners' feelings (n = 6) [7, 8, 42, 53, 61, 64], and preventing HIV or STIs (n = 6) [7, 20, 53, 64, 68, 73] were reported as primary reasons for forming an agreement. Among those with closed or monogamous agreements, simply desiring to be in a monogamous relationship was listed in four studies [42, 44, 69, 73]. Among those with open agreements, the ability to be more sexually adventurous was reported in five studies [8, 42, 44, 53, 61]. Suspicion of infidelity by bringing up the desire to form an agreement was the only reason reported for deciding not to form an agreement [59]. One study investigated reasons for breaking agreements, reporting "feeling horny," "not being able to control their urges," and feeling "deserving of an exciting sex life" as top reasons [37].

Links Between Sexual Agreements and Outcomes

Adherence to agreements, sometimes reported as sexual agreement breaks, was one outcome reported in seventeen studies. Prevalence of breaks in sexual agreements, where at least one partner reported non-adherence, ranged from 2 to 80% [13, 33].

Agreement breaks occurred across all agreement types, though some protective factors against breaking an agreement were reported. In three studies, couples with higher scores for commitment, mutual constructive communication style, dependability, predictability, faith in partner, and social support and who scored higher on the sexual agreement investment scale were more invested in their agreements and less likely to break agreements [26, 27, 38]. Seven studies reported several factors that were associated with higher odds of breaking an agreement. These included: longer relationship length [45], less commitment to sexual agreement [24], using marijuana or amyl nitrates within the relationship [19], being the younger partner in age [39], earning less income than a partner [39], being the white partner in white-minority relationship [39], sexual dissatisfaction [34, 38], and dissatisfaction with the sexual agreement [55].

Two studies reported that the subjective seriousness of breaking an agreement was the same across agreement types [23, 55]. In one study, researchers found that having a "just in case clause" made some couples feel safe to use condoms during a break and to get tested [68].

Recent adherence to a sexual agreement was associated with increased scores in measures of sexual agreement investment [14, 26], agreement satisfaction [24, 27, 55], commitment to an agreement [17, 24, 27, 29], and valuing a sexual agreement [24, 27].

Four studies reported positive associations between having a sexual agreement and positive relationship characteristics. More investment in a sexual agreement was associated with increased intimacy [14], relationship satisfaction [14, 26] and trust [14]. Higher levels of agreement satisfaction was associated with increased intimacy, commitment, and sexual satisfaction [49]. Increased commitment to an agreement was associated with higher scores in mutual constructive communication and relationship commitment [24].

Twenty-seven studies presented links between sexual agreements and sexual health behavior. These included associations between agreements and engaging in unprotected anal intercourse (UAI) within the relationship (n = 5) and UAI outside the relationship (n = 9), substance use with sex (n = 2), and frequency of HIV testing (n = 2).

Engaging in UAI within the couple was found to be negatively associated with: sexual agreement investment [15, 18], commitment to the agreement [17], and being in a closed agreement [15, 17, 18]. This behavior was positively associated with perceiving that a main partner had recently been tested [18].

Engaging in UAI outside of the relationship was negatively associated with: having an established sexual agreement [26], sexual agreement investment [14, 25, 26], satisfaction with agreement [25], commitment to agreement [17, 24, 25], valuing the agreement [15, 18], concordance on agreement type [17], being in a closed agreement compared to being in an open agreement [15, 18], and having a discrepant agreement compared to having an open agreement [47], and higher scores on the relationship quality enhancement motivation subscale [61]. One study reported that among trans women/cis male couples, male partner's sexual life enhancement motivation scores were associated with higher odds of engaging in UAI [61].

Associations between sexual agreements and testing for HIV during the relationship were reported by two studies. One study found that men who never tested for HIV while in their current relationship reported higher levels of sexual agreement investment and satisfaction when compared to other testing groups [28]. This study also found that agreement concurrence was associated with being more likely to have tested every 3, 4 or 6 months. Another study found that couples with open agreements had greater odds of having been tested for HIV in the previous 6 months [21].

Of the two studies reporting associations between substance use and sexual agreements, both found that men with open agreements were more likely to use substances [19, 46]. One study found the odds of breaking an agreement were positively associated with one or both partners using marijuana or amyl nitrates during sex [19].

In addition to reporting prevalence of sexual agreement typology, fifteen studies also reported associations between agreement type and health behavior and/or relationship outcomes. Among these studies, both risk and protective behaviors were associated with having an open/non-monogamous agreement: couples with an open agreement were more likely to use substances with sex [19] and more likely to report UAI outside of a relationship [18] and to have UAI with both a main partner and an outside partner in the same time frame [18]; individuals in open relationships were more likely to have been tested for HIV recently [21, 22].

Three studies found associations between having an open agreement and health related attitudes. These included: more positive attitude towards couples HIV testing and counseling (CHTC) [30]; more likely to perceive themselves at risk for HIV [21]; less confidence in remaining HIV- negative [21]; and more likely to perceive a higher prevalence of HIV among sex partners [22].

Associations between agreements and relationship satisfaction were reported in three studies. Couples in open relationships: scored lower in passion [55]; had less reports of intimate partner violence IPV [66]; among heterosexual couples, men in non-monogamous relationships reported greater commitment and satisfaction than women, although both had higher satisfaction with open agreements if they also scored higher on a scale measuring socio-sexuality [23].

Increased age, being a race other than white, longer relationship duration and HIV sero-discordance were also positively associated with having an open agreement in one study, as was having a high endorsement of normative masculinity [62].

Nine studies also reported associations between closed/monogamous agreements and behaviors as well as relationship satisfaction. Protective health behaviors that were associated with closed agreements included lower odds of UAI with an outside partner [15, 18, 27] and more likely to have a health protective communication style [29].

Closed agreements were reported to have the following associations with relationship benefits: higher investment in the relationship [26, 53], greater intimacy [7], higher levels of trust [7], higher scores in commitment to partner [7, 29], higher scores in attachment to partner [7], a higher level of dedication to partner [63], and more likely to report greater equality in the relationship [7]. Some negative relationship characteristics associated with closed agreements were reported as well. Having a closed agreement was associated with higher scores on sexual jealousy [46, 49] and being more likely to report poorer quality of alternatives to the relationship [63].

Two studies also found that agreement concurrence was associated with certain health behaviors and relationship

benefits. Couples who concurred about their agreement type were more likely to have been recently tested for HIV, scored higher on measures of relationship satisfaction [27], and had more positive attitudes towards CHTC [30].

Two studies reported findings on discrepant agreements. Discrepant agreements were associated with increased mutual avoidance and withholding communication style [7] and higher levels of sexual jealousy compared with open couples [46].

Four studies reported associations between sexual agreements and HIV status and sero-concordance among couples. One study found that the odds of engaging in UAI outside of the relationship was higher among those with open relationships, regardless of the couples' sero-concordance. However, odds of engaging in this behavior were highest among concordant HIV-negative couples, followed by discordant couples, and lowest among concordant HIV-positive couples [34]. Three studies also reported that agreement investment lowered the odds of these couples engaging in UAI outside the relationship, regardless of agreement type [7, 25, 34].

Regarding sexual agreement investment and satisfaction, concordant HIV-positive couples were least satisfied and invested in their agreements [34]. Among these studies, concordant HIV-negative couples were more invested in their agreements.

Links Between Negotiated Safety and Outcomes

All studies that examined negotiated safety reported links between negotiated safety and health behavior (n = 10). The most commonly reported associated health behavior was UAI, both within and outside of the primary relationship. Other health behaviors reported included HIV testing [10] and avoidance of anal intercourse altogether [51]. Four studies reported descriptive data on negotiated safety agreements including motivations for making such agreements [52, 73], beliefs about UAI [52], allowed behaviors within an agreement [16], and attitudes toward negotiated safety [56].

In addition to prevalence of negotiated safety among couples, five studies also reported rates of other risk behavior. These included prevalence of: UAI with casual and steady partners [50, 72, 74], agreement adherence [10, 70], HIV testing behavior [74], and knowledge of partners' HIV status [74]. Two studies measured and reported longitudinal data showing rates of UAI and agreement adherence over the course of the relationship [10, 50]. Rates of breaking a negotiated safety agreement ranged from 6 to 39% [16, 70]. Only three studies reported prevalence of breaks to an agreements and disclosure of the broken agreement [16, 50, 70].

Two studies reported associations between having a negotiated safety agreement and relationship characteristics. One study found that high satisfaction with a relationship was associated with being more likely to have a negotiated safety agreement [51]. Another found that perceiving UAI as a symbol of trust was associated with a higher likelihood that couples practiced negotiated safety [52].

Differences Between Same-Sex and Opposite-Sex Couples

Among same sex couples the prevalence of having an agreement of any type ranged from 58 to 99% [7, 11] and prevalence of having a discrepant agreement ranged between 5 and 46% [48] [67]. The prevalence of closed agreements ranged from 13% [11] to 78% [53] and the prevalence of open agreements ranged from 11 to 64% [14, 67]. In contrast, among opposite sex couples, having an agreement of any type ranged from 50 to 82% [56, 60]. Closed agreements ranged from 40 to 82% [12, 58] and open agreements ranged from 12 to 37% [23, 57]. Only one study of opposite sex couples reported agreement discordance, which was 30% [23]. Finally, two studies found that 17% [57] and 18% [60] of opposite sex couples reported having no agreement.

Among studies that focused on opposite sex couples (n = 9), only one study measured agreement satisfaction [23]. Agreement characteristics such as agreement investment and commitment, which have been linked to agreement adherence and risk behavior in studies of MSM, have not been adequately explored among opposite sex couples. Of the studies including opposite sex couples, only two discussed agreement formation, both identifying the potential role of CHTC sessions in guiding couples to initiate explicit discussion of sexual agreements [57, 59]. Three studies with opposite sex couples examined agreement adherence [29, 56, 58]. One study found that commitment to an agreement was the only predictor of agreement adherence [29]. Another study reported that 30% of the sample experienced a break in their agreement [23]. A third study found that women in heterosexual relationships reported the existence of their agreement to be the reason for engaging in health protective behavior such as condom use [56].

Agreement explicitness was discussed in studies among opposite sex couples. In one study, "understandings" were more pervasive than explicit discussions when formulating sexual agreements [59]. In another study, 96% of males expected exclusivity but only 51% reported having ever explicitly discussing such an agreement. Similarly, 97% of female respondents expected monogamy, but only 66% had reported an explicit discussion about sexual agreements [13].

Discussion

The present review contributes to a comprehensive understanding of the current state of knowledge around sexual agreements and negotiated safety by summarizing existing

literature, identifying gaps in knowledge and recommending directions for future investigation. After more than 10 years of research, studies have identified several important associations between sexual agreements and health behavior, though the extent to which these associations exist outside of male dyads living in high-income countries remains unclear. Understanding sexual agreement formation and its impact on relational and sexual health outcomes is critical to the development of future dyadic intervention strategies, however, there is clearly a need to expand research to all relationship types and contexts, including opposite sex relationships and relationships in low and middle income countries. With evidence that primary partnerships are the main source of heterosexual HIV transmissions in low income countries [75], and evidence of high prevalence of HIV among MSM in these settings [76], there is clearly a need to explore the associations between sexual agreements and HIV risk behaviors in low income settings.

This review shows that most sexual agreements research has focused on MSM and gay/bisexual men, with fifty-four studies limiting their samples to MSM participants, though a small number of studies included in this review (n = 12) indicate that other populations may benefit from sexual agreements. One study that recruited 191 transgender women and their regular male partners, found that relationship and sexual motivations behind agreement formation were associated with reduced odds of male partners engaging in condomless sex outside of the relationship [61]. Transgender women are disproportionately affected by HIV [77] and thus research attention is needed to assess characteristics of sexual agreement formation, adherence and links to health protective behaviors in this population.

Another group largely absent from the sexual agreements literature is opposite sex couples, particularly in resource poor settings, despite evidence of high rates of HIV infections [78, 79]. There is a paucity of research that has focused on understanding sexual agreement formation or adherence in this population. The limited studies that have focused on heterosexual couples in the US point to the willingness to engage in sexual agreement formation but also the need for further investigation. Among couples that did report having a sexual agreement, explicitness [12] and difficulty bringing up agreements within an already established relationship [59] were barriers to agreement concurrence and adherence. However, three studies found that couples were generally willing to discuss sexual agreements in the context of a CHTC session to help prevent HIV and as a way to strengthen their relationships [30, 57, 59]. Although literature has examined relationship typologies (e.g., monogamy) among heterosexual couples [80] few studies have conceptualized relationships among heterosexuals as "sexual agreements." Further work is needed with opposite sex couples to understand the motivations for sexual agreement formation, or lack of, and factors that influence agreement breaks and health outcomes.

This review revealed variations between studies in how open/non-monogamous agreements are categorized. Seventeen studies defined open agreements broadly, that is, any open agreement including those with or without rules was categorized as open. In contrast, thirty-five studies identified differences among open agreements and categorized them accordingly to capture degrees of openness (e.g., monogamish, threesome only, explicit vs. non-explicit non-monogamy). These differences in methods of categorization could account for some differences in the associations between agreements and sexual and relational health outcomes and the wide variations in reported prevalence of agreements. Although twenty-two studies divided open agreements into subcategories, only eight [9, 11–13, 49, 55, 57, 62] reported associated between subcategories of open agreements and outcomes. For example, one study that looked at 229 gay males in Australia [55], reported that level of passion was the only relationship characteristic that differed between couples with monogamous agreements, open agreements, or threesome only agreements. Among the studies which differentiated between types of open agreements, one reported that because the number of couples reporting open agreements was so small, comparing subcategories of openness did not provide enough power to detect significant differences [49]. Three studies compared subcategories of open agreements by reporting them as allowed behaviors (i.e., "agreements which allow casual sex" vs. "agreements which do not allow casual sex") [11, 18, 36]. More research is needed to clarify if key differences exist between subcategories of openness and how this could influence agreement formation.

Prevalence of breaks in agreements were only reported in seventeen studies, and these were exclusive to studies of male dyads. Measuring and understanding reasons for breaks is important due to the potential for a break to increase HIV risk within the relationship [38]. However, specific sexual risk behaviors associated with breaks, (i.e., whether an agreement break lead to condomless anal intercourse outside the relationship) was only addressed in nine of these studies [19, 24, 32, 38, 41, 47, 64, 71, 73]. One study did report the characteristics of agreement breakage and found that 20% of sero-concordant HIV-negative male couples and 41% of sero-discordant male couples broke their agreement by engaging in UAI outside of the relationship [38]. Another study reported that engaging in UAI was the primary way that partners broke agreements [44], though not the only way. Further investigation is warranted on the reasons for agreement breaks, in which contexts they are most likely to occur, what specific behaviors constitute a high-risk break, and development of better models for disclosure. Additionally, many of the studies were conducted prior to the widespread use of PrEP and/or

TasP (Treatment as Prevention) as strategies for HIV risk reduction. Future studies may be able to further explore the use of PrEP and TasP in the context of sexual agreements and what impact this may have on risk, if any.

Conclusion

This scoping review has identified areas for further research and gaps in the current evidence-base for sexual agreements. Studies show that agreement formation, adherence, and break disclosure have important implications for HIV risk and behavior as well as relational health and satisfaction. Sexual agreement characteristics have associations with protective behaviors such as HIV testing frequency, condom use, and relationship satisfaction. With evidence showing that among male couples, primary partners are the source of approximately one-third [1] to two-thirds [2] of new HIV infections, couples-based research and programming has become increasingly important for HIV prevention efforts among MSM. This has driven the attention on sexual agreements to be focused predominantly on male couples in high-income countries despite evidence that sexual agreements may benefit other populations [56, 59, 61]. This review identified several areas of future research attention. First, the expansion of sexual agreements research to include wider range of couple types (i.e., opposite sex couples) and contexts (i.e., resource poor settings). Second, the need to move towards standardizing measurements sexual agreement types to allow comparisons across studies and populations. Third, there is a lack of research that has focused on breaks in agreements and what specific behavior constitutes these breaks, despite potential implications for HIV risk, relational health, and opportunity for development of break disclosure strategies and agreement formation. This review of the landscape of sexual agreements has underscored the importance of understanding sexual agreement formation, characteristics and links to health and relationship outcomes, and has identified the gaps in the current knowledge base to inform the direction of future research.

Funding No funding was received for this research.

Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical Approval This article does not contain any studies with human participants or animals performed by any of the authors.

References

1. Davidovich U, de Wit J, Albrecht N, Geskus R, Stroebe W, Coutinho R. Increase in the share of steady partners as a source of HIV infection: a 17-year study of seroconversion among gay men. AIDS. 2001;15(10):1303–8.
2. Sullivan PS, Salazar L, Buchbinder S, Sanchez TH. Estimating the proportion of HIV transmissions from main sex partners among men who have sex with men in five US cities. AIDS. 2009;23(9):1153–62.
3. Prevention CfDCa. Complete listing of risk reduction evidence-based behavioral interventions CDC. https://www.cdc.gov/hiv/research/interventionresearch/compendium/rr/complete.html (2018). Accessed 23 Jan 2018.
4. Sullivan PS, Goodreau SM, Carnegie NB, Vittinghoff E, Lama JR, Sanchez J, et al. Correction: what drives the US and peruvian HIV epidemics in men who have sex with men (MSM)? PLoS ONE. 2013;8(7):10–1371.
5. Xiridou M, Geskus R, de Wit J, Coutinho R, Kretzschmar M. The contribution of steady and casual partnerships to the incidence of HIV infection among homosexual men in Amsterdam. AIDS. 2003;17(7):1029–38.
6. Burton J, Darbes LA, Operario D. Couples-focused behavioral interventions for prevention of HIV: systematic review of the state of evidence. AIDS Behav. 2010;14(1):1–10.
7. Hoff CC, Beougher SC, Chakravarty D, Darbes LA, Neilands TB. Relationship characteristics and motivations behind agreements among gay male couples: differences by agreement type and couple serostatus. AIDS Care. 2010;22(7):827–35.
8. Mitchell JW, Lee JY, Woodyatt C, Bauermeister J, Sullivan P, Stephenson R. Perceived challenges and rewards of forming a sexual agreement among HIV-negative male couples. Arch Sex Behav. 2016;45(6):1525–34.
9. Hosking W. Satisfaction with open sexual agreements in Australian gay men's relationships: the role of perceived discrepancies in benefit. Arch Sex Behav. 2013;42(7):1309–17.
10. Kippax S, Crawford J, Davis M, Rodden P, Dowsett G. Sustaining safe sex: a longitudinal study of a sample of homosexual men. AIDS. 1993;7(2):257–63.
11. Cuervo M, Whyte J. The effect of relationship characteristics on HIV risk behaviors and prevention strategies in young gay and bisexual men. J Assoc Nurses AIDS Care. 2015;26(4):399–410.
12. Séguin LJ, Blais M, Goyer M-F, Adam BD, Lavoie F, Rodrigue C, et al. Examining relationship quality across three types of relationship agreements. Sexualities. 2016;20(1–2):86–104.
13. Richters J, Heywood W, Pitts MK, Shelley JM, Simpson JM, Patrick K, et al. Who's cheating? Agreements about sexual exclusivity and subsequent concurrent partnering in Australian heterosexual couples. Sex Health. 2014;11(6):524–31.
14. Neilands TB, Chakravarty D, Darbes LA, Beougher SC, Hoff CC. Development and validation of the sexual agreement investment scale. J Sex Res. 2010;47(1):24–37.
15. Mitchell JW, Champeau D, Harvey SM. Actor-partner effects of demographic and relationship factors associated with HIV risk within gay male couples. Arch Sex Behav. 2013;42(7):1337–45.
16. Crawford JM, Rodden P, Kippax S, Van de Ven P. Negotiated safety and other agreements between men in relationships: risk practice redefined. Int J STD AIDS. 2001;12(3):164–70.
17. Mitchell JW, Harvey SM, Champeau D, Seal DW. Relationship factors associated with HIV risk among a sample of gay male couples. AIDS Behav. 2012;16(2):404–11.
18. Mitchell JW, Petroll AE. Factors associated with men in HIV-negative gay couples who practiced UAI within and outside of their relationship. AIDS Behav. 2013;17(4):1329–37.

19. Mitchell JW, Boyd C, McCabe S, Stephenson R. A cause for concern: male couples' sexual agreements and their use of substances with sex. AIDS Behav. 2014;18(7):1401–11.
20. Beougher SC, Chakravarty D, Garcia CC, Darbes LA, Neilands TB, Hoff CC. Risks worth taking: safety agreements among discordant gay couples. AIDS Care. 2012;24(9):1071–7.
21. Stephenson R, White D, Darbes L, Hoff C, Sullivan P. HIV testing behaviors and perceptions of risk of HIV infection among MSM with main partners. AIDS Behav. 2015;19(3):553–60.
22. Stephenson R, White D, Mitchell JW. Sexual agreements and perception of HIV prevalence among an online sample of partnered men who have sex with men. Arch Sex Behav. 2015;44(7):1813–9.
23. Rodrigues D, Lopes D, Pereira M. "We agree and now everything goes my way": consensual sexual nonmonogamy, extradyadic sex, and relationship satisfaction. Cyberpsychol Behav Soc Netw. 2016;19(6):373–9.
24. Mitchell JW. Between and within couple-level factors associated with gay male couples' investment in a sexual agreement. AIDS Behav. 2014;18(8):1454–65.
25. Darbes LA, Chakravarty D, Neilands TB, Beougher SC, Hoff CC. Sexual risk for HIV among gay male couples: a longitudinal study of the impact of relationship dynamics. Arch Sex Behav. 2014;43(1):47–60.
26. Gass K, Hoff CC, Stephenson R, Sullivan PS. Sexual agreements in the partnerships of internet-using men who have sex with men. AIDS Care. 2012;24(10):1255–63.
27. Mitchell JW, Harvey SM, Champeau D, Moskowitz DA, Seal DW. Relationship factors associated with gay male couples' concordance on aspects of their sexual agreements: establishment, type, and adherence. AIDS Behav. 2012;16(6):1560–9.
28. Mitchell JW, Horvath KJ. Factors associated with regular HIV testing among a sample of US MSM with HIV-negative main partners. J Acquir Immune Defic Syndr. 2013;64(4):417–23.
29. Warren JT, Harvey SM, Agnew CR. One love: explicit monogamy agreements among heterosexual young adult couples at increased risk of sexually transmitted infections. J Sex Res. 2012;49(2–3):282–9.
30. Mitchell JW. Gay male couples' attitudes toward using couples-based voluntary HIV counseling and testing. Arch Sex Behav. 2014;43(1):161–71.
31. Hoff CC, Campbell CK, Chakravarty D, Darbes LA. Relationship-based predictors of sexual risk for HIV among MSM couples: a systematic review of the literature. AIDS Behav. 2016;20(12):2873–92.
32. Leblanc NM, Mitchell JW, De Santis JP. Negotiated safety—components, context and use: an integrative literature review. J Adv Nurs. 2017;73(7):1583–603.
33. Mitchell JW, Moskowitz DA, Seal DW. Understanding the agreements and behaviors of men who have sex with men who are dating or married to women: unexpected implications for a universal HIV/STI testing protocol. Int Public Health J. 2012;4(4):393–402.
34. Hoff CC, Chakravarty D, Beougher SC, Darbes LA, Dadasovich R, Neilands TB. Serostatus differences and agreements about sex with outside partners among gay male couples. AIDS Educ Prev. 2009;21(1):25–38.
35. Kippax S, Slavin S, Ellard J, Hendry O, Richters J, Grulich A, et al. Seroconversion in context. AIDS Care. 2003;15(6):839–52.
36. Prestage G, Jin F, Zablotska I, Grulich A, Imrie J, Kaldor J, et al. Trends in agreements between regular partners among gay men in Sydney, Melbourne and Brisbane, Australia. AIDS Behav. 2008;12(3):513–20.
37. Hoff CC, Chakravarty D, Beougher SC, Neilands TB, Darbes LA. Relationship characteristics associated with sexual risk behavior among MSM in committed relationships. AIDS Patient Care STDS. 2012;26(12):738–45.
38. Gomez AM, Beougher SC, Chakravarty D, Neilands TB, Mandic CG, Darbes LA, et al. Relationship dynamics as predictors of broken agreements about outside sexual partners: implications for HIV prevention among gay couples. AIDS Behav. 2012;16(6):1584–8.
39. Perry NS, Huebner DM, Baucom BR, Hoff CC. Relationship power, sociodemographics, and their relative influence on sexual agreements among gay male couples. AIDS Behav. 2016;20(6):1302–14.
40. Mitchell JW, Sophus AI. Perceptions and definitions of power within the context of HIV-negative male couples' relationships. Am J Mens Health. 2017;11(4):801–10.
41. Mitchell JW, Lee JY, Woodyatt C, Bauermeister J, Sullivan P, Stephenson R. HIV-negative male couples' attitudes about pre-exposure prophylaxis (PrEP) and using PrEP with a sexual agreement. AIDS Care. 2016;28(8):994–9.
42. Mitchell JW, Lee JY, Woodyatt C, Bauermeister J, Sullivan P, Stephenson R. Illuminating the context and circumstances of male couples establishing a sexual agreement in their relationship. Am J Mens Health. 2017;11(3):600–9.
43. Mitchell JW, Lee JY, Woodyatt C, Bauermeister J, Sullivan P, Stephenson R. Decisions about testing for HIV while in a relationship: perspectives from an urban, convenience sample of HIV-negative male couples who have a sexual agreement. Arch Sex Behav. 2017;46(4):1069–77.
44. Mitchell JW. Characteristics and allowed behaviors of gay male couples' sexual agreements. J Sex Res. 2014;51(3):316–28.
45. Mitchell JW. Aspects of gay male couples' sexual agreements vary by their relationship length. AIDS Care. 2014;26(9):1164–70.
46. Parsons JT, Starks TJ, Gamarel KE, Grov C. Non-monogamy and sexual relationship quality among same-sex male couples. J Fam Psychol. 2012;26(5):669–77.
47. Parsons JT, Starks TJ. Drug use and sexual arrangements among gay couples: frequency, interdependence, and associations with sexual risk. Arch Sex Behav. 2014;43(1):89–98.
48. Hoff CC, Beougher SC. Sexual agreements among gay male couples. Arch Sex Behav. 2010;39(3):774–87.
49. Hosking W. Australian gay men's satisfaction with sexual agreements: the roles of relationship quality, jealousy, and monogamy attitudes. Arch Sex Behav. 2014;43(4):823–32.
50. Davidovich U, de Wit J, Stroebe W. Assessing sexual risk behaviour of young gay men in primary relationships: the incorporation of negotiated safety and negotiated safety compliance. AIDS. 2000;14(6):701–6.
51. Davidovich U, Wit J, Strobbe W. Relationship characteristics and risk of HIV infection: Rusbult's investment model and sexual risk behavior of gay men in steady relationships. J Appl Soc Psychol. 2006;36(1):22–40.
52. Davidovich U, de Wit JB, Stroebe W. Behavioral and cognitive barriers to safer sex between men in steady relationships: implications for prevention strategies. AIDS Educ Prev. 2004;16(4):304–14.
53. Greene GJ, Andrews R, Kuper L, Mustanski B. Intimacy, monogamy, and condom problems drive unprotected sex among young men in serious relationships with other men: a mixed methods dyadic study. Arch Sex Behav. 2014;43(1):73–87.
54. Macapagal K, Greene GJ, Rivera Z, Mustanski B. "The best is always yet to come": relationship stages and processes among young LGBT couples. J Fam Psychol. 2015;29(3):309–20.
55. Hosking W. Agreements about extra-dyadic sex in gay men's relationships: exploring differences in relationship quality by agreement type and rule-breaking behavior. J Homosex. 2013;60(5):711–33.
56. Bertens MG, Wolfers ME, van den Borne B, Schaalma HP. Negotiating safe sex among women of Afro-Surinamese

and Dutch Antillean descent in the Netherlands. AIDS Care. 2008;20(10):1211–6.
57. Jones JS, Stephenson R, Wall KM, Sullivan PS. Relationship agreements and willingness to participate in couples HIV testing and counseling among heterosexuals in the US. Open AIDS J. 2014;8:50–7.
58. Rodrigues D, Lopes D, Smith CV. Caught in a "bad romance"? Reconsidering the negative association between sociosexuality and relationship functioning. J Sex Res. 2016. https://doi.org/10.1080/00224499.2016.1252308.
59. Stephenson R, Finneran C, Goldenberg T, Coury-Doniger P, Senn TE, Urban M, et al. Willingness to use couples HIV testing and discussion of sexual agreements among heterosexuals. Springerplus. 2015;4:169.
60. Wall KM, Canary L, Workowski K, Lockard A, Jones J, Sullivan P, et al. Acceptability of couples' voluntary HIV testing among HIV-infected patients in care and their HIV-negative partners in the United States. Open AIDS J. 2016;10:1–13.
61. Gamarel KE, Reisner SL, Darbes LA, Hoff CC, Chakravarty D, Nemoto T, et al. Dyadic dynamics of HIV risk among transgender women and their primary male sexual partners: the role of sexual agreement types and motivations. AIDS Care. 2016;28(1):104–11.
62. Wheldon CW, Pathak EB. Masculinity and relationship agreements among male same-sex couples. J Sex Res. 2010;47(5):460–70.
63. Whitton SW, Weitbrecht EM, Kuryluk AD. Monogamy agreements in male same-sex couples: associations with relationship quality and individual well-being. J Couple Relatsh Ther. 2015;14(1):39–63.
64. Huebner DM, Mandic CG, Mackaronis JE, Beougher SC, Hoff CC. The impact of parenting on gay male couples' relationships, sexuality, and HIV risk. Couple Family Psychol. 2012;1(2):106–19.
65. Kramer SC, Drewes J, Kruspe M, Marcus U. Factors associated with sexual risk behaviors with non-steady partners and lack of recent HIV testing among German men who have sex with men in steady relationships: results from a cross-sectional internet survey. BMC Public Health. 2015;15:702.
66. Pruitt KL, White D, Mitchell JW, Stephenson R. Sexual agreements and intimate-partner violence among male couples. Int J Sex Health. 2015;27(4):429–41.
67. Sullivan PS, Wall KM, O'Hara B, Jones J, Barnes J, DiClemente R, et al. The prevalence of undiagnosed HIV serodiscordance among male couples presenting for HIV testing. Arch Sex Behav. 2014;43(1):173–80.
68. Beougher SC, Gomez W, Hoff CC. The couple as context: Latino gay male couples and HIV. Cult Health Sex. 2011;13(3):299–312.
69. Williams W, Goldenberg T, Andes KL, Finneran C, Stephenson R. 'He's still with these girls': exploring perceptions of HIV risk among men with behaviourally bisexual male partners. Cult Health Sex. 2016. https://doi.org/10.1080/13691058.2016.1189595.
70. Guzman R, Colfax G, Wheeler S, Mansergh G, Rader M, Buchbinder S. Negotiated safety relationships and sexual behavior among a diverse sample of HIV-negative men who have sex with men. J Acquir Immune Defic Syndr. 2005;38(1):82–6.
71. Jin F, Crawford J, Prestage GP, Zablotska I, Imrie J, Kippax SC, et al. Unprotected anal intercourse, risk reduction behaviours, and subsequent HIV infection in a cohort of homosexual men. AIDS. 2009;23(2):243–52.
72. Kippax S, Noble J, Prestage G, Crawford J, Campbell D, Baxter D, et al. Sexual negotiation in the AIDS era: negotiated safety revisited. AIDS. 1997;11(2):191–7.
73. Grace D, Chown SA, Jollimore J, Parry R, Kwag M, Steinberg M, et al. HIV-negative gay men's accounts of using context-dependent sero-adaptive strategies. Cult Health Sex. 2014;16:316–30.
74. Elford J, Bolding G, Maguire M, Sherr L. Sexual risk behaviour among gay men in a relationship. AIDS. 1999;13(11):1407–11.
75. Dunkle KL, Stephenson R, Karita E, Chomba E, Kayitenkore K, Vwalika C, et al. New heterosexually transmitted HIV infections in married or cohabiting couples in urban Zambia and Rwanda: an analysis of survey and clinical data. Lancet. 2008;371(9631):2183–91.
76. Beyrer C, Baral SD, van Griensven F, Goodreau SM, Chariyalertsak S, Wirtz AL, et al. Global epidemiology of HIV infection in men who have sex with men. Lancet. 2012;380(9839):367–77.
77. Baral SD, Poteat T, Strömdahl S, Wirtz AL, Guadamuz TE, Beyrer C. Worldwide burden of HIV in transgender women: a systematic review and meta-analysis. Lancet Infect Dis. 2013;13(3):214–22.
78. HIV/AIDS key facts: World Health Organization. http://www.who.int/en/news-room/fact-sheets/detail/hiv-aids (2018).
79. Collaborators GH. Estimates of global, regional, and national incidence, prevalence, and mortality of HIV, 1980–2015: the Global Burden of Disease Study 2015. Lancet Infect Dis. 2016;3(8):e361–87.
80. Christopher FS, Sprecher S. Sexuality in marriage, dating, and other relationships: a decade review. J Marriage Fam. 2000;62(4):999–1017.