

Prevalence of Intimate Partner Violence Among Men Who Have Sex With Men: An Updated Systematic Review and Meta-Analysis



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ABSTRACT

Introduction: Intimate partner violence (IPV) among men who have sex with men (MSM) has become a serious and widespread public health issue, which might result in low quality of life and increase the global burden of diseases.

Aim: To quantitatively estimate the pooled prevalence of IPV and its specific forms (physical violence, sexual violence and emotional violence) among MSM.

Methods: Databases of PubMed, Cochrane Library, CINAHL, MEDLINE, PsycINFO, CNKI, WANFANG Data, and Weipu (CQVIP) Data were searched for identified studies published between January 1990 and August 2020. Random effect meta-analyses were used to synthesize the pooled prevalence and 95% CIs of IPV.

Main Outcome Measures: The pooled prevalence of IPV in victimization and in perpetration among MSM.

Results: A total of 52 studies with 32,048 participants were included for final analysis. The pooled prevalence of IPV was 33% (6,342 of 19,873; 95%CI, 28–39%) in victimization and 29% (1,491 of 5,983; 95%CI, 17–40%) in perpetration across all recall periods among MSM population. Furthermore, the pooled prevalence of physical violence was 17% (3,979 of 22,928; 95%CI, 14–20%) and 12% (942 of 9,236; 95%CI, 10–15%), of sexual violence was 9% (1,527 of 19,511; 95%CI, 8–11%) and 4% (324 of 8,044; 95%CI, 3–5%), of emotional violence was 33% (5,147 of 17,994; 95%CI, 25–40%) and 41% (1,317 of 3,811; 95%CI, 17–65%) in victimization and perpetration, respectively. Out of all the IPV identified, emotional violence was estimated at the highest level.

Conclusion: This study demonstrated a high prevalence of IPV both in victimization and perpetration among MSM, and emotional violence was estimated at the highest level out of all IPV forms. Efforts are needed to develop corresponding prevention programs for victims with an intent to increase the accessible availability of health services, and ultimately improve their life quality. **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. Sex Med 2021;9:100433.**

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Key Words: Intimate Partner Violence (IPV); Domestic Violence; Men Who Have Sex With Men (MSM); Meta-Analysis

INTRODUCTION

Intimate partner violence (IPV) refers to “any behaviour within an intimate relationship that causes physical, psychological or sexual harm to those in the relationship”, which mainly include physical assault, sexual compulsivity, psychological abuse and other aggressive behaviours.¹ The study of IPV in men who have sex with men (MSM) began at the end of the 1980s and the begin of the 1990s. Since then, there has been a gradual increase in the number of studies that have analyzed violence in this population. In recent decades, research on this topic demonstrated that IPV in MSM has become a serious

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and widespread public health issue.^{2–5} A systematic review with 28 empirical studies in the US reported that the prevalence of IPV ranged from 29.7% to 78.0% across all recall periods in male couples,⁶ the number was comparable to and even higher than that documented in heterosexual couples.^{6–8} Another meta-analysis including 17 studies (n = 13,797) published before 2014 concluded that the combined prevalence of lifetime IPV in victimization was 41.24% (95%CI: 32.38–50.11%).⁹ We also learned that IPV was negatively associated with the quality of close relationship among MSM,^{10,11} as well as the series of adverse health outcomes, like the higher risk of sexually transmitted diseases especially HIV,^{12,13} substance-abusing,^{2,14} depression,^{9,15} and minority stress (eg, internalized homophobia, homophobic discrimination),^{16,17} which might result in low quality of life¹⁸ and increase burden of medical service. For example, it has been reported that high levels of HIV infection in MSM significantly correlated with IPV,⁹ which encouraged the need to understand IPV phenomenon among this population. At the social-cultural level, the fact that marriage equality and other policies may shape IPV in the way that the policy doesn't for homosexual couples. For instance, in 2015, China passed its first law anti-domestic violence, calling for strengthening the protection for teenagers, the elderly, the disabled people, pregnant women and seriously ill patients who are victims of violence,¹⁹ but it ignored homosexual population. At the sexual minorities level, the intersectionality of gender and sexual identity also create a spectrum of unique factors among this population. A conceptual model proposed by Katrina Kubicek²⁰ outlined that the variables of age, gender role (including aggressive/assertive, competitive, homophobic behavior), and sexual identity (including internalized homophobia, sexual positioning, limited family support) could shape the development of dating and sexual scripts, resulting in IPV of young MSM. These factors indicate IPV in MSM might be more prevalent and severe than general population. Therefore, assessing a pooled prevalence to evaluate the burden of IPV and further developing the intervention strategies are necessary.

Despite the two existing reviews^{9,21} have summarized the prevalence of IPV among MSM, they failed to report this issue in more detail. For instance, the review²¹ conducted by Fineran and Stephenson provided and explained the results in words rather than the pooled prevalence estimate due to the paucity of data on IPV. Another meta-analysis⁹ mainly focused on the association between IPV and related health outcomes among MSM. Although this study provided a pooled IPV prevalence in victimization, but it failed to report the estimate of prevalence in perpetration, which also exerted significant impact on this population in a violent relationship.²² Furthermore, this meta-analysis did not conduct deeper subgroup analysis, such as different recruitment methods and IPV measurement tools. However, these methodologies used in primary studies varied greatly,^{2,14,23,24} which might contribute a wide range prevalence estimate of IPV and significant heterogeneity across studies. In

addition, a dearth of primary studies conducted in low- and middle-income countries were included in these two systematic reviews. With the IPV evidences^{17,25,26} from low- and middle-income countries, such as China, Brazil, South Africa, emerging in recent years, a more comprehensive pooled prevalence of IPV among MSM population is needed to estimate comprehensively. Finally, there are more than 20 additional related papers published after the publication of these 2 two systematic reviews.^{9,21} Hence, enough data exist to yield a summary prevalence via a meta-analysis to produce more reliable prevalence of IPV among MSM.

Given this serious public health problem in MSM and the weakness of the previous reviews, we elaborated on this systematic review and meta-analysis. We aimed to investigate followed questions: (i) what were the pooled prevalence of IPV and its specific forms (physical violence, sexual violence and emotional violence) both in victimization and perpetration in MSM? (ii) what were the disparity of different subgroups, such as different recall periods, different sampling method, different country income categories? and (iii) what could be the underlying sources of heterogeneity between included studies?

MATERIAL AND METHODS

We performed this meta-analysis following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)²⁷ Statement, and Meta-analyses Observational Studies in Epidemiology guidelines (MOOSE).²⁸ The present study was registered in the PROSPERO (CRD42020158575).

Search Strategy

The electronic search was carried out for eligible studies published from January 1990 to August 2020, in the English databases of PubMed, Cochrane library, the Cumulative Index to Nursing and Allied Health Literature [CINAHL], MEDLINE, PsycINFO, and Chinese databases of China National Knowledge Infrastructure [CNKI], WANFANG Data, Weipu (CQVIP) Data by using the following key terms: MSM and intimate partner violence, MSM and domestic violence, and abusive same-sex intimate relationship. Moreover, a hand search was conducted in the target journals of *Trauma, Violence, & Abuse, Journal of Aggression Maltreatment & Trauma, AIDS Behavior, Journal of the Association of Nurses in AIDS Care, Journal of Homosexuality, Journal of Interpersonal Violence, Journal of Injury and Violence, Journal of Gay & Lesbian Social Service, Journal of Family Violence, and LGBT Health.*

Inclusion and Exclusion Criteria

The studies were eligible if they (i) had been published between January 1990 and August 2020; (ii) were published in English or Chinese; (iii) were original quantitative research, including cross-sectional, case-control, and cohort studies;

(iv) reported the subjects to be 15 years old or older; (v) reported the sample size to be at least 50; (vi) reported the sample made up of participants who self-identified as gay or bisexual men and/or reported having a stable male-male romantic relationships in the past 6 months; (7) measured IPV, including the specific forms like physical IPV, emotional IPV and/or sexual IPV between MSM.

The studies were excluded if they (i) reported IPV in a specific sample that made it difficult to reflect entire MSM population, such as HIV positive individuals, participants reported substance abuse et al; (ii) reported the target population that were not differentiated from gay, lesbian, bisexual, transgender in an LGBT sample; (iii) reported the violence experience outside an intimate relationship, such as childhood sexual abuse, sexual abuse in a commercial sexual relationship.

Selection Procedure and Data Extraction

Step 1, the titles and abstracts of potentially eligible studies were screened by M.L. and W.H.L., based on the above inclusion and exclusion criteria. Step 2, the full texts against eligibility criteria was assessed independently by two reviewers (M.L. and W.H.L.), and any disagreement was resolved by a third researcher (P.X.). Step 3, Two authors (M.L. and P.X.) carried out the data extraction from the final included studies (Figure 1). Extracted data included the following: first author, year of publication, country, sampling method, the period of recall, measurement tool of IPV, type(s) of IPV, sample size and number of cases who experienced IPV.

Quality Appraisal

The quality appraisal was conducted independently by M.L. and P.X., using the standardized criteria of “Methodological quality evaluation of descriptive research on same-sex intimate partner violence” developed by Murray and Mobley.²⁹ These criteria for quality appraisal had been used among the general population and same-sex couples in the previous reviews.^{30–32} The appraisal tool comprises 15 criteria with a dichotomous response scale (present or absent). Specifically, 1 score refers to present, 0 score refers to absent. The total score ranges from 0 to 15. Then, studies were clarified into three types: (i) acceptable (11–15 points); (ii) adequate (6–10 points); (iii) unacceptable (0–5 points). In our review, the original study which rated as “acceptable” or “adequate” was included. Other “unacceptable” studies were deemed to be a high-risk bias and excluded from the data set.

Data Analysis

Random effects meta-analyses were used to synthesize the prevalence of IPV. I^2 statistic, which described the proportion of heterogeneity observed in the total variability attributing to heterogeneity between studies and not to chance, was calculated.³³

I^2 being 25%, 50%, 75% were considered as the low, middle and high level of heterogeneity, respectively.

The results from studies were grouped by two thematic blocks of violence: IPV in victimization and perpetration. Based on this classification, we further categorized the results by different forms of violence, including any violence, physical violence, sexual violence, and emotional violence, with calculations of the pooled prevalence and its 95% confident intervals (CI). To explore the potential source of heterogeneity, subgroup analysis and meta-regression were conducted based on the following study characteristics: country income categories (based on the economic income level from World Bank Web³⁴), year of publication, sampling method, measurement tools, and recall period. To simplify our analysis, the recall periods were categorized as “recent” (within 12 months) and “over the lifespan” (over 12 months). The measurement tools presented in studies were divided into “standardized” (whole or part of items from validated scales or questionnaires used) and “by author’s” (eg, “In the past 12 months, have any of yours partners ever tried to hurt you?” “This included pushing you, holding you down, hitting you with a fist, kicking you, attempting to strangle you, and/or attacking you with a knife, gun or other weapons” et al). It should be pointed out that not every included study in our systematic review reported the prevalence of IPV and its specific forms. In this sense, each subgroup of our analysis consisted of different number of studies.

Sensitivity analysis was conducted subsequently to determine the influence of individual study on the overall prevalence estimates. Egger linear regression test³⁵ was used to calculate small study effects and possible publication bias. All statistical analyses were performed by using Stata software (version 14.2; Stata Corporation, College Station, TX, USA),³⁶ with a significance threshold of $P < .05$.

RESULTS

Study Characteristics

A total of 52 studies were included for final data analysis in this review (Figure 1). Among them, all studies reported the prevalence of IPV in victimization, with a combined sample of 32,048 participants. Twenty studies reported the prevalence of IPV in perpetration, with a combined sample of 12,729 participants. Concerning the different forms of IPV, 34, 35, 29 and 30 studies reported any violence, physical violence, sexual violence, and emotional violence in victimization, respectively. A total of 11, 17, 14 and 10 studies reported any violence, physical violence, sexual violence, and emotional violence in perpetration, respectively.

The study regions of identified studies covered 11 countries, which included 36 in U.S.,^{2,4,10,14,16,17,23,24,37–63} 11 in China,^{3,11–13,15,64–69} 2 in U.K.,^{17,70} 2 in Canada,^{17,71} 2 in Spain,^{25,72} 2 in South Africa,^{17,73} 1 in Australia,¹⁷ 1 in Brazil,¹⁷ 1 in Mexico,²⁵ 1 in Venezuela²⁵ and 1 in Chile.²⁵ Forty-eight

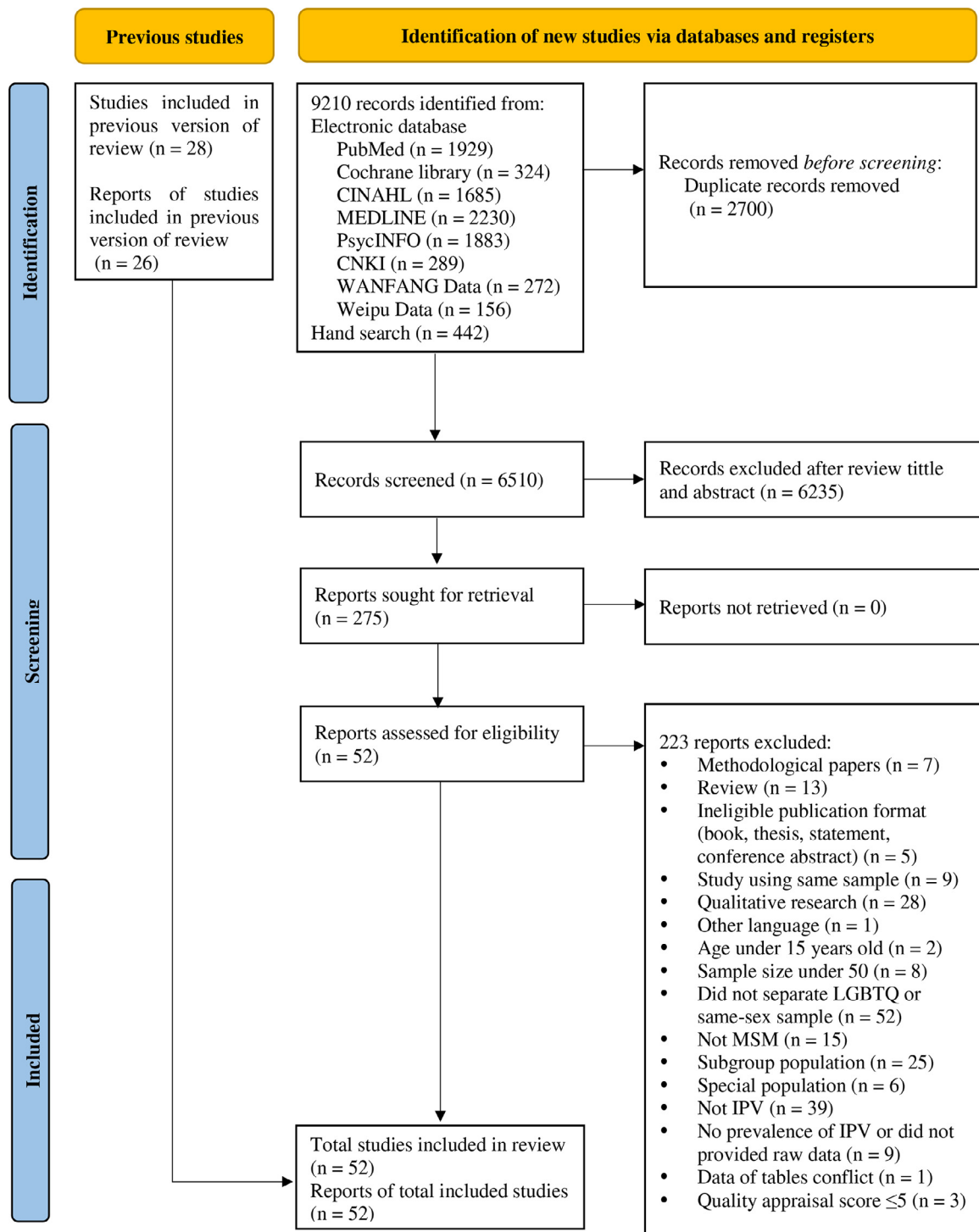


Figure 1. PRISMA flow diagram for study selection.

studies adopted cross-sectional design and 5 adopted the baseline data from prospective studies. The quality appraisal score of these studies ranged from 6 to 11, with a mean score of 8. Based on the quality assessment criteria, 49 studies were rated as “adequate

studies” and 3 studies were rated as “acceptable studies” (S_8). The characteristics of the 52 studies identified were provided in Table 1.

Table 1. Characteristic of studies included in this review (*N* = 52)

Year	First author	Country	Income category	Sexual orientation	Sampling method	Recall period	IPV types	Measurement
2014	Alvin Tran	U. S	HIC	Gay, bisexual, straight and other men	VBS	5 y	IPV	CTS2
2016	Alissa Davis	U. S	HIC	MSM	Multi-frame sampling	12 mo	IPV, physical/sexual, emotional	IPV-GBM Scale
2015	Alissa Davis	China	LMIC	MSM, MSMW	Convenience sampling	5 y	IPV	Items
2014	Catherine Finneran	U. S	HIC	Homosexual, bisexual men	Convenience sampling	12 mo	Physical/sexual	Items
2013	Kristin L. Dunkle	China	LMIC	Gay, heterosexual and other men	RDS	5 y	IPV	Items
2012	Ying Li	U. S	HIC	MSM	VBS	5 y	IPV, physical, sexual, verbal	Items
2011	Rob Stephenson	U. S	HIC	MSM	Convenience sampling	Unspecified	Physical, sexual, emotional	CTS2
2018	Ying Liu	China	LMIC	Gay and non-gay men	VBS	Lifetime	IPV, physical, sexual, psychological	WHO questionnaires [†]
2011	Stephenson Robert	South Africa	LMIC	Homosexual/gay, bisexual, unsure and other men	Convenience sampling	12 mo	Physical, sexual	Items
2019	Dannuo Wei	China	LMIC	Bisexual, homosexual men	VBS	Lifetime	IPV, physical, sexual, psychological	IPV-GBM Scale
2010	Rob Stephenson	U. S	HIC	Bisexual, homosexual men	Convenience sampling	12 mo	Physical, sexual	Items
2015	John K. Williams	U. S	HIC	Gay, bisexual, heterosexual men	Multi-frame sampling	Ever	IPV, physical, emotional	Items
2017	Yong Yu	China	LMIC	Gay men	RDS	Ever	IPV, physical, sexual, emotional	Items
2015	A. Koblin	U. S	HIC	Gay, bisexual, straight men	VBS	Ever	Violence	Items
2000	Luis E. Nieves-Rosa	U. S	HIC	MSM	VBS	Ever	Domestic abuse, physical, sexual, psychological	Items
2011	Seth L. Welles	U. S	HIC	Straight, gay, bisexual and other men	VBS	Current	Physical, sexual	IPV perpetration scale
2002	Gregory L. Greenwood	U. S	HIC	MSM	Probability-based sampling	5 y	Physical, psychological, sexual	CTS2
2013	Rob Stephenson	U. S	HIC	Gay and bisexual men	VBS	12 mo	Physical, sexual	Items
2019	Natasha Dickerson-Amaya	U. S	HIC	Gay and bisexual men	Probability-based sampling	Ever	IPV	NVWS
2019	Rob Stephenson	U. S	HIC	Gay and others men	Multi-frame sampling	12 mo	IPV, physical, emotional	IPV-GBM Scale
2016	Dustun T. Duncan	U. S	HIC	Gay, bisexual men and other men	VBS	Lifetime	IPV, physical, sexual, emotional	Items
2014	Catherine Finneran	U. S	HIC	Gay and bisexual men	VBS	12 mo	IPV	Items
2017	Diandian Li	China	LMIC	Gay and bisexual men	Convenience sampling	6 mo	IPV, physical, psychological, sexual	CTS2S
2011	Jonathan Oringher	U. S	HIC	Gay men	Convenience sampling	Lifetime	IPV, physical, sexual	CTS2

(continued)

Table 1. Continued

Year	First author	Country	Income category	Sexual orientation	Sampling method	Recall period	IPV types	Measurement
2012	Catherine Finneran	Six countries*	HIC/LMIC	Gay men	Convenience sampling	12 mo	Physical, sexual	Items
2007	Matthew B. Feldman	U. S	HIC	Gay and bisexual men	VBS	Lifetime	IPV, physical, psychological, sexual	Items
2007	Eric Houston	U. S	HIC	Gay and bisexual men	Multi-frame sampling	Any time	IPV, physical, verbal, sexual	Items
2015	Kaitlyn L. Pruitt	U. S	HIC	MSM	Convenience sampling	12 mo	IPV, physical, sexual, emotional	IPV-GBM Scale
2008	Kim Bartholomew	Canada	HIC	Gay and bisexual men	Multi-frame sampling	Ever	Physical, emotional, sexual	CTS2
2016	LJ Bacchus	U.K.	HIC	Gay and bisexual men	VBS	12 mo	IPV	Items (base on COHSAR)
2004	Jose Toro-alfonso	U. S	HIC	Gay men	Multi-frame sampling	Unspecified	Physical, emotional, sexual	Self-administered instrument
2013	Yong Yu	China	LMIC	Gay men	Probability-based sampling	Lifetime	IPV, physical, emotional, sexual	Items
2014	Kristin M Wall	U. S	HIC	Gay and bisexual men	VBS	3 mo	IPV	CTS2
2019	LIN Kai-hao	China		Gay, bisexual and other men	VBS	Unspecified	IPV	Items
2010	Carolyn F. Wong	U. S	HIC	Gay and bisexual men	VBS	Ever	Physical, emotional, sexual	WEB
2007	David S. Bimbi	U. S	HIC	Gay and bisexual men	VBS	5 y	Physical	CTS2
2018	Jaime Barrientos	Four countries [†]	HIC/LMIC	Gay men	Convenience sampling	Unspecified	Psychological	Items
2018	Lara Longares	Spain	HIC	Gay men	Non-probabilistic sampling	Unspecified	Psychological	EAPA-P
2011	Brian C. Kelly	U. S	HIC	Gay and bisexual men	VBS	5 y	IPV	CTS2
2016	Katrina Kubicek	U. S	HIC	Gay and bisexual men	Convenience sampling	12 mo	Physical, psychological, sexual	CTS2
2020	Liping Peng	China	LMIC	Homosexual, heterosexual, bisexual men and not sure	Multi-frame sampling	Ever	IPV, physical, emotional, sexual	IPV-GBM Scale
2000	Susan C. Turell	U. S	HIC	Gay and bisexual men	Multi-frame sampling	Ever	Physical, emotional, sexual	A survey
2012	Jeffrey T. Parsons	U. S	HIC	Gay and bisexual men	VBS	5 y	IPV	Items
2012	Sheryl M Strasser	U. S	HIC	Gay men	Multi-frame sampling	Unspecified	Physical	PASPH
2016	Rob Stephenson	U. S	HIC	Gay and bisexual men	VBS	12 mo	Physical/sexual, emotional	IPV-GBM Scale
2007	Brian Mustanski	U. S	HIC	Gay, bisexual and other men	VBS	Ever	IPV	Items
2016	Christipher B. Stults	U. S	HIC	MSM	Multi-frame sampling	Lifetime	IPV	CTS2
2018	Yong Yu	China	LMIC	Gay men	RDS	Ever	Dating violence, physical, emotional, sexual	DVQ
2017	Tyson R. Reuter	U. S	HIC	Gay men	Multi-frame sampling	Ever	Any abuse, physical, verbal	H-RASP

(continued)

Table 1. Continued

Year	First author	Country	Income category	Sexual orientation	Sampling method	Recall period	IPV types	Measurement
2020	Dannuo Wei	China	LMIC	Gay, bisexual and other men	VBS	Lifetime	IPV, physical, emotional, sexual	IPV-CBM Scale (parts of items)
2020	Akshay Sharma	U. S	HIC	Gay, bisexual and other men	Convenience sampling	6 mo	IPV, physical, emotional	IPV-CBM Scale
2020	Stephen C. Bosco	U. S	HIC	Gay and bisexual men	Multi-frame sampling	5 y	IPV, physical, emotional, sexual	CTS2

*including U.S., Canada, Australia, U.K., South Africa, Brazil.

†including Spain, Mexico, Venezuela, Chile.

‡indicating the items of WHO Multi-country Study on Women's Health and Domestic Violence against Women. COHSAR = comparing heterosexual and same sex abuse in relationship; CTS2 = Revised Conflict Tactics Scale; CTS2S = the short form of Revised Conflict Tactics Scale; DVQ = Dating Violence Questionnaire; EAPA-P = Scale of Psychological Abuse in Couples; HIC = high-income countries (gross national income per capita > 12,535\$); H-RASP = HIV-Risk Assessment of Sexual Partnerships LMIC = low- and middle-income countries (gross national income per capita ≤ 12,535\$); NWWS = National Violence against Women Survey; PASPH = partner abuse scale-physical; RDS = respondent-driven sampling; VBS = venue-based sampling; WEB = Women's Experience with Battering (WEB) scale.

Intimate Partner Violence in Victimization

Meta-analytic pooling of the prevalence of any violence reported by 34 studies yielded a combined estimation of 33% (6,342 of 19,873; 95%CI, 28% – 39%), with high heterogeneity ($I^2 = 98.6\%$, $P < .001$) (Figure 2). In the analysis on the specific forms of IPV, the results showed the pooled prevalence in physical violence of 17% (3,979 of 22,928; 95%CI, 14% – 20%; $I^2 = 97.7\%$, $P < .001$), in sexual violence of 9% (1,527 of 19,511; 95% CI, 8% – 11%; $I^2 = 94.4\%$, $P < .001$), and in emotional violence of 33% (5,147 of 17,994; 95% CI, 25% – 40%; $I^2 = 99.4\%$, $P < .001$) (Figure 3–5). It was observed that the pooled prevalence of emotional violence (33%) was significantly greater than that in physical violence (17%) and sexual violence (9%). Moreover, physical violence had a higher estimated prevalence (17%) than sexual violence (9%) (Table 2). Sensitivity analysis demonstrated that no study significantly affected the overall prevalence estimate of IPV and its specific forms (S_6 Fig 1–4).

Sub-group meta-analysis demonstrated that those studies which used multi-frame sampling method and adopted standardized measurement tools presented higher estimated prevalence in any violence and its 3 specific forms. Those studies which conducted in high income countries (HIC) and published between 2000 and 2010 only presented higher prevalence in physical and emotional violence (Table 2).

In the meta-regression analysis, it was found that country income category could explain part of high heterogeneity of pooled prevalence in physical violence ($P = 0.029$) and emotional violence ($P = 0.029$), respectively. In addition, sampling method contributed the high heterogeneity of pooled prevalence in any violence ($P = 0.026$) (Table 4). Egger's test suggested publication bias was found in any violence ($b = -11.01$, $P < .001$), physical violence ($b = -6.98$, $P < .001$), sexual violence ($b = -6.93$, $P = .004$) and emotional violence ($b = -14.57$, $P < .001$) (S_7 Fig 1–4).

Intimate Partner Violence in Perpetration

Meta-analysis showed a pooled prevalence of any violence in perpetration of 29% (1,491 of 5,983; 95% CI, 17% – 40%), with a significant high heterogeneity ($I^2 = 99.5\%$, $P < .001$) (S_5 Fig 1). When further explored the pooled prevalence of different forms of IPV, the combined estimate was 12% (95% CI, 10% – 15%) in physical violence, 4% (95% CI, 3% – 5%) in sexual violence and 41% (95% CI, 17% – 65%) in emotional violence, with high heterogeneity (S_5 Fig 2–4). However, similar to IPV in victimization, it was observed that the pooled prevalence of emotional violence (41%) was highest among three forms of IPV, and the rate of physical violence (12%) was greater than sexual violence (4%) (Table 3). Sensitivity analysis demonstrated that no study significantly affected the overall prevalence estimate of IPV and its specific forms (S_6 Fig 5–8).

Sub-group meta-analysis demonstrated that the prevalence of any violence was higher in those studies which conducted in

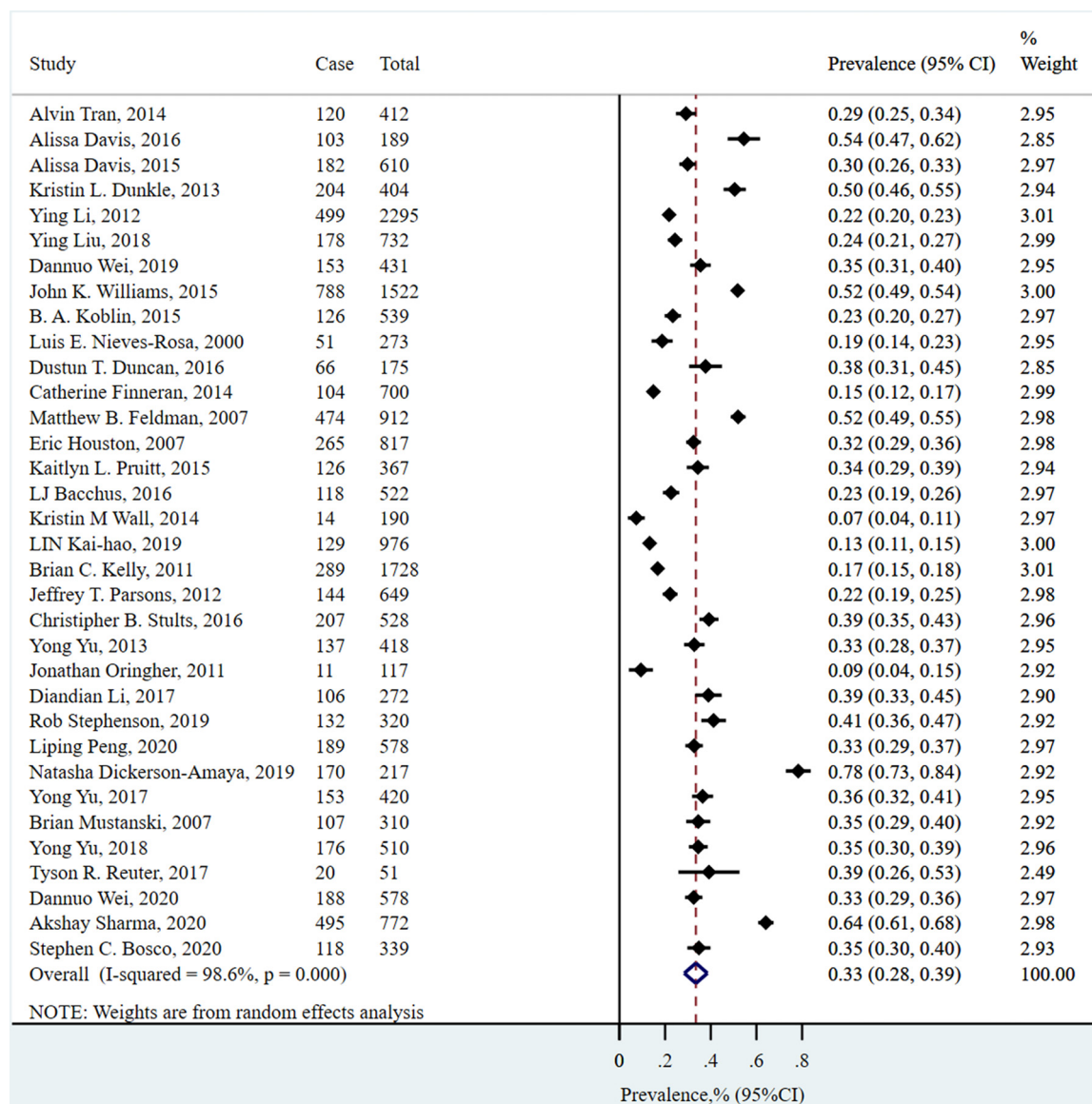


Figure 2. Forest plot of prevalence of any type of intimate partner violence (IPV) in victimization across all recall periods.

low- and middle- income countries (LMIC), published between 2011 and 2020, used multi-frame sampling method, and used the recall period of recent relationship. In addition, those conducted in HIC, published between 2000 and 2010 and used multi-frame sampling method had higher estimated prevalence of physical and emotional violence. However, the studies used standardized measurement tools only had higher estimated prevalence of physical and sexual violence (Table 3).

Meta-regression analysis revealed that measurement tool was reported to explain the part of high heterogeneity of prevalence in physical violence ($P=.008$) and sexual violence ($P=.023$) (Table 4). Publication bias was found in the analysis of the combined estimates of any violence ($b = -13.29$, $P=.004$), physical violence ($b = -10.54$, $P<.001$), sexual violence ($b = -11.72$,

$P=.002$), and emotional violence ($b = -15.63$, $P<.001$) (S_7 Fig 5-8).

DISCUSSION

Main Findings

To the best of our knowledge, this is the first meta-analysis to systematically investigate the prevalence of IPV and its specific forms both in victimization and perpetration among MSM population. Considering the weakness of previous reviews, we included Chinese language literature and more original studies from low- and middle- income countries, aiming to yield a more comprehensive prevalence of IPV. Meanwhile, subgroup analysis for exploring the potential influencing factors were also carried

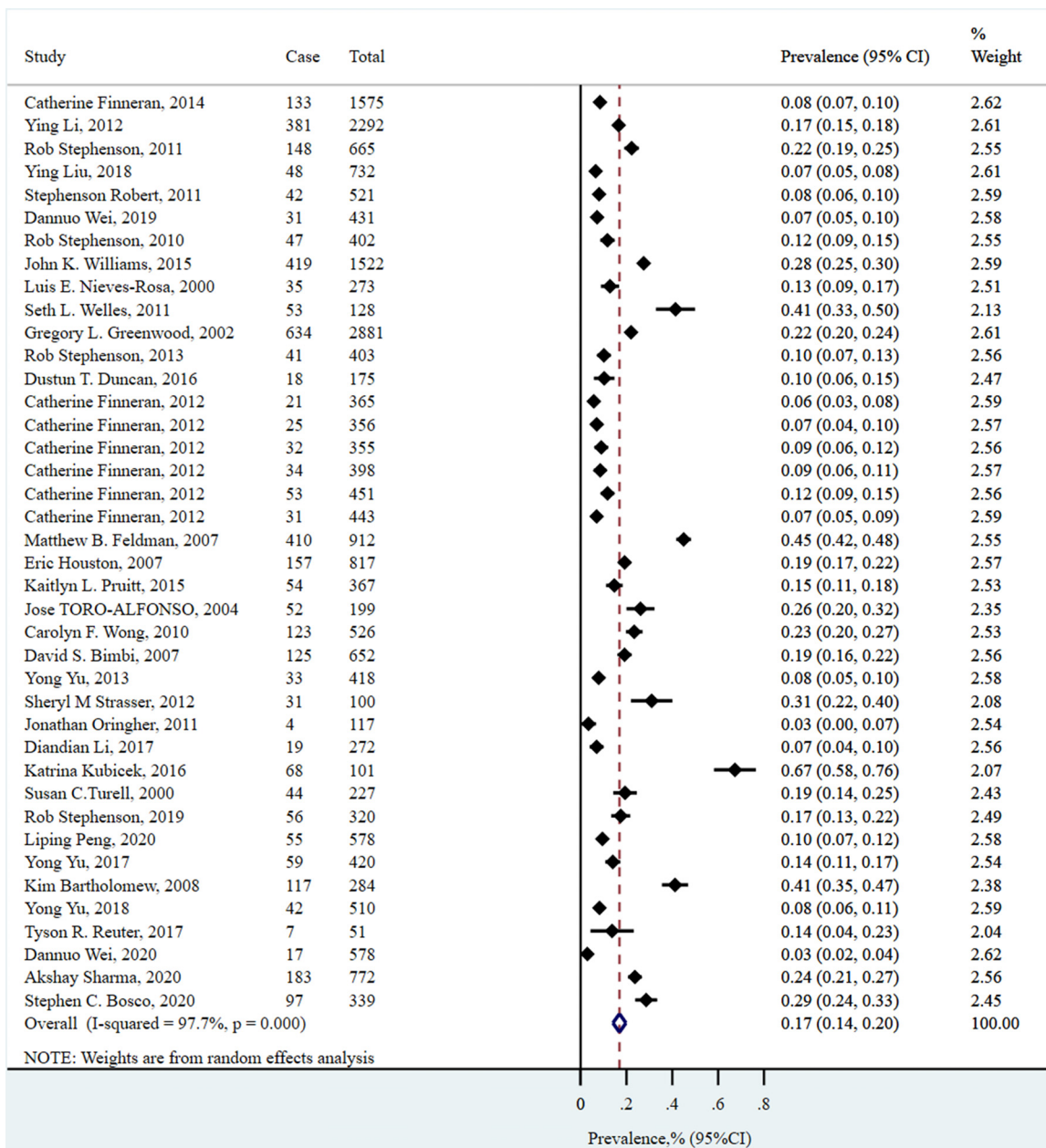


Figure 3. Forest plot of prevalence of physical violence in victimization across all recall periods.

out to further understand the contextual difference of IPV among MSM.

Our study showed the pooled prevalence of any violence was 33% in victimization (95% CI, 28% – 39%) and 29% (95% CI, 17% – 40%) in perpetration across all recall periods among MSM population. The prevalence was also reported high among lesbian population in another meta-analysis, with 48% of IPV victimization over the lifetime.³¹ These results were similar to or even higher than the prevalence of IPV in heterosexual couples,^{74–76} which was in accordance with the conclusions of the previous literature.^{21,24,45} For example, a meta-analysis with 13 studies among heterosexual women during pregnancy in China

demonstrated the prevalence of IPV victimization to be 7.7% (95%CI: 5.6%–10.1%).⁷⁷ Another meta-analysis review focused on military populations, including 42 primary studies, and showed the pooled prevalence of IPV perpetration were 27% (95%CI: 23%–32%) and 22% (95%CI: 17%–27%) for men and women, respectively.⁷⁸

Out of all the IPV identified, emotional violence was estimated at the highest level among the three types, with the combined estimate of 33% (95% CI, 25% – 40%) in victimization, and of 41% (95% CI, 17% –65%) in perpetration. The similar pattern was observed from previous original studies^{2,23,26,67} and shared a similar conclusion by another review on IPV among

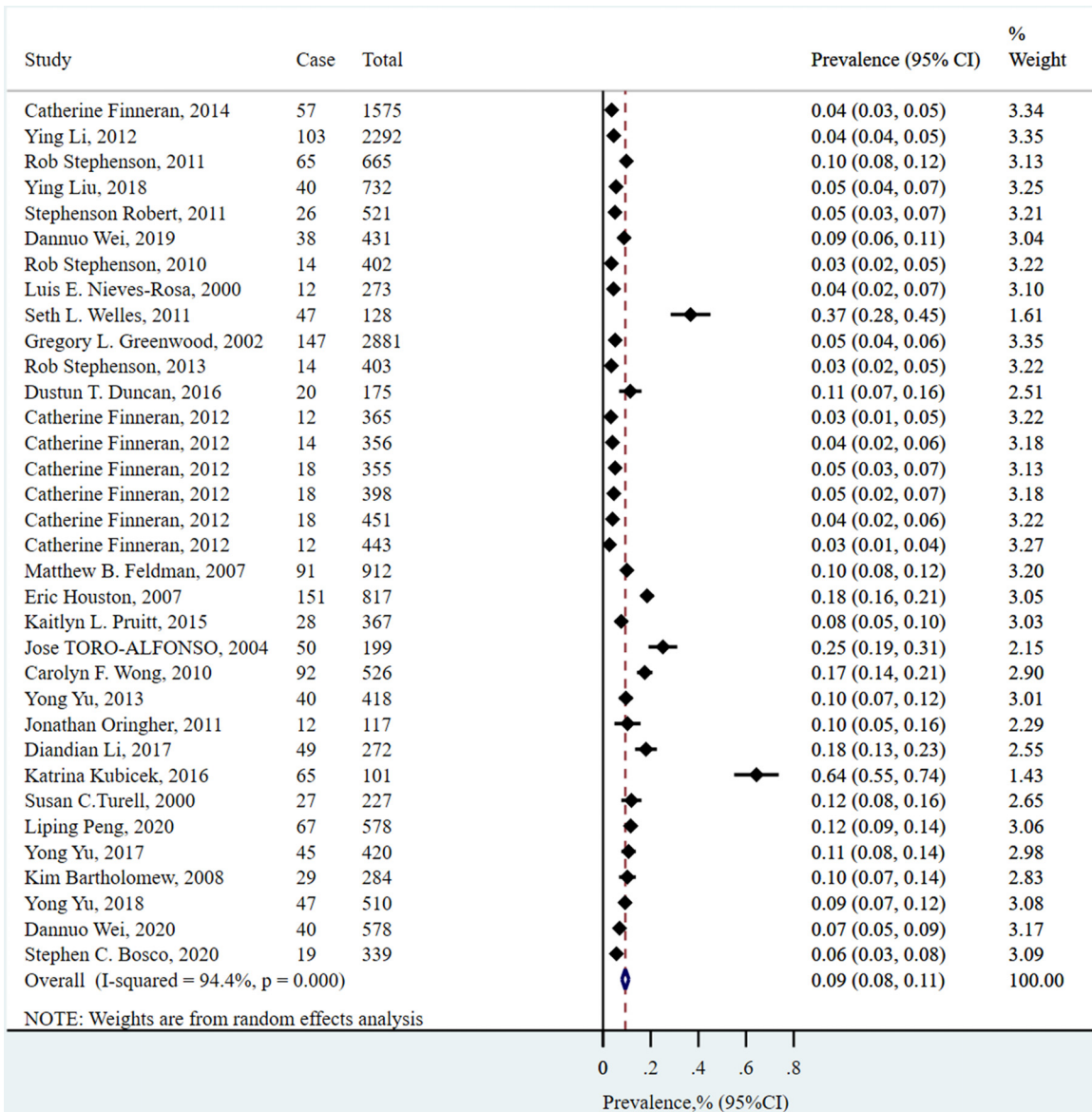


Figure 4. Forest plot of prevalence of sexual violence in victimization across all recall periods.

self-identified lesbians,³¹ indicating that emotional violence was very common in same-sex couples. This could be explained that same-sex couples might experience sexual minority stress (including internalized homophobia, homophobia discrimination, stigma consciousness, et al), which played an important role in maintaining IPV among them. As Stults pointed out, “gay-related stigma may shape their beliefs regarding their ability to interrupt cycles of violence and may lead to increased hostility toward same-sex partners, making acts of violence more likely”,⁷⁹ especially emotional violence. Moreover, the victims of same-sex couples may not seek help from professionals due to the fear of rejection and discrimination related to their sexual orientation,⁸⁰ which would reversely contribute to a high level of IPV among this population.

Our study also revealed that the prevalence of IPV was higher when conducting in HIC, using multi-frame recruitment and standardized scales. Interestingly, income category merely explained the heterogeneity between the included studies for victimization but not perpetration in our results. It might due to the varied countries involved these 2 thematic blocks, and substantially different methodologies and measurements. In addition, the higher prevalence of physical and emotional violence was observed in HIC, but not obvious in any violence and sexual violence. Compared with MSM living in LMIC, those living in HIC might suffer from higher level of mental distress like anxiety and depression, and substance abuse and HIV infection, which have been proved to be strongly associated with IPV among MSM population.^{9,81} However, it does provide an idea that

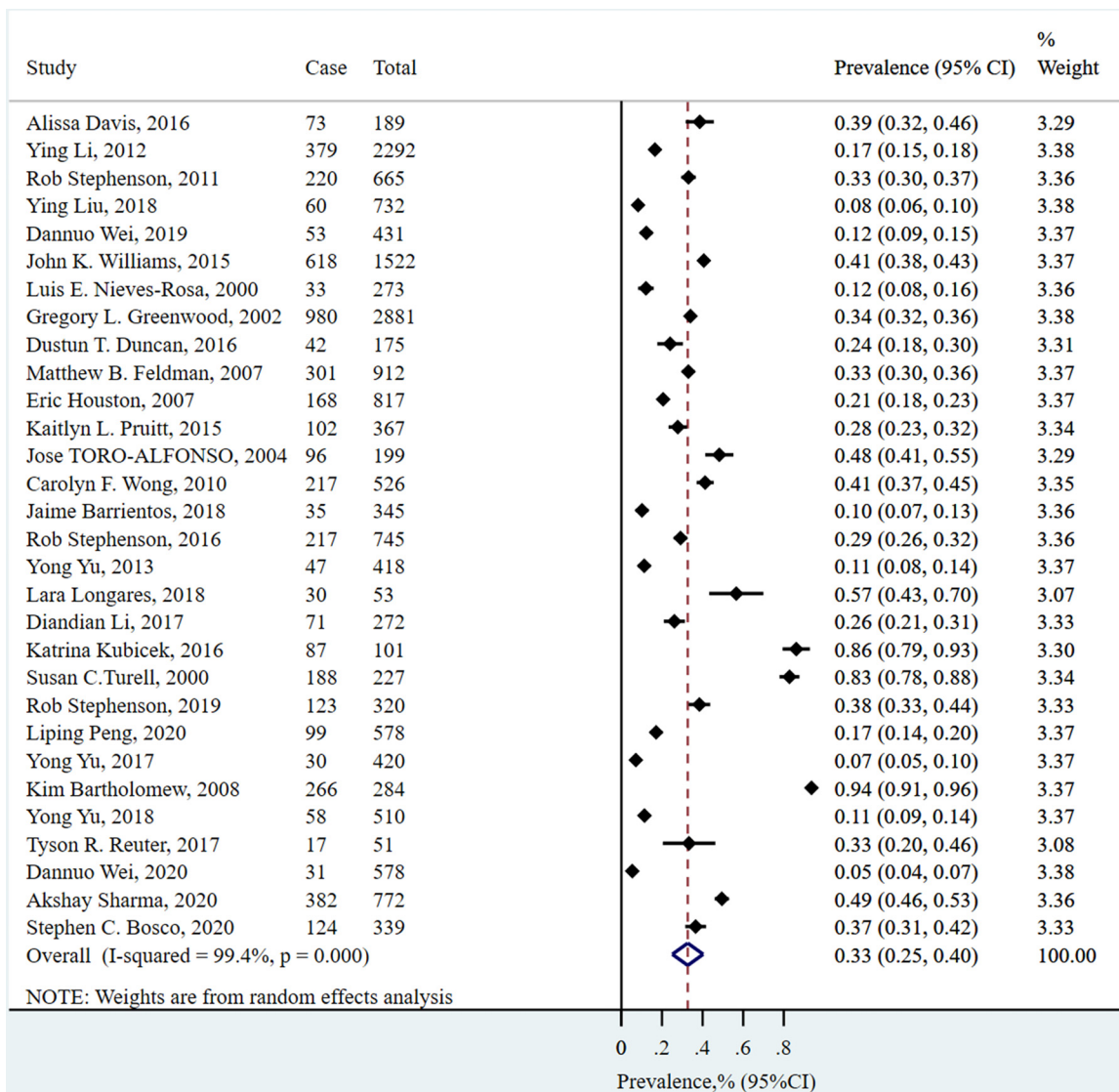


Figure 5. Forest plot of prevalence of emotional violence in victimization across all recall periods.

income category could partly explain the heterogeneity between the included studies.

Additionally, as a subgroup of sexual minority population, MSM are regarded to be hidden population. Recruiting a representative sample of this population is challenging. One previous study compared three recruitment methods (respondent-driven sampling, community popular opinion leaders, and internet and venue-based sampling) illustrated that each single recruitment strategy may only target the subgroup of MSM with specific socio-demographic characteristics and risk profiles.⁸² Another systematic review suggested that using multiple non-probability sampling methods and including a probability sampling component would contribute to get a representative sample for hidden population.⁸³ All is suggesting the multiple sampling methods to be encouraged for future studies to obtain a more representative sample of MSM.

For measurements, some studies relied on several self-made items to capture IPV with relatively low prevalence might due to the lack of accurate definition and validity unique to MSM. For instance, some special types of IPV such as emotional violence, HIV-related violence would be less likely to be reported, leading to a “silent epidemic” of IPV among this population. Furthermore, compared with standardized measurement, self-made items have no strong internal and external reliability with potential to yield a less precise rate of IPV, allowing a bias understanding of the male-male partner violence. One such previous study⁸⁴ had demonstrated that validated scales had a higher IPV prevalence among gay and bisexual men when compared to other item-selected questions, which was consistent with our findings. Thus, the standardized measurement should be encouraged to apply in future studies on MSM abusive partner relationship.

Table 2. Pooled prevalence of IPV in victimization among MSM

Subgroup	Any type of violence				Physical violence				Sexual violence				Emotional violence			
	Studies (n)	n/N	Prevalence (95%CI)	I ² (P)	Studies (n)	n/N	Prevalence (95%CI)	I ² (P)	Studies (n)	n/N	Prevalence (95%CI)	I ² (P)	Studies (n)	n/N	Prevalence (95%CI)	I ² (P)
<i>Country income category</i>																
HIC	23	4547/13944	0.34 (0.27, 0.41)	98.9% <.001	26	3549/17574	0.20 (0.17, 0.24)	97.6% <.001	20	1105/14157	0.10 (0.08, 0.12)	95.5% <.001	21	4663/13710	0.42 (0.32, 0.51)	99.4% <.001
LMIC	11	1795/5929	0.33 (0.26, 0.39)	97.0% <.001	10	430/5354	0.08 (0.06, 0.10)	85.1% <.001	10	422/5354	0.08 (0.06, 0.10)	89.4% <.001	9	484/4284	0.12 (0.09, 0.15)	91.4% <.001
<i>Year</i>																
2000 – 2010	4	897/2312	0.34 (0.21, 0.48)	98.0% <.001	10	1744/7173	0.24 (0.18, 0.30)	97.1% <.001	9	613/6521	0.11 (0.08, 0.15)	96.1% <.001	8	2249/6119	0.46 (0.26, 0.65)	99.7% <.001
2011 – 2020	30	5445/17561	0.33 (0.28, 0.39)	98.6% <.001	25	2235/15755	0.14 (0.12, 0.17)	96.9% <.001	20	914/12990	0.09 (0.07, 0.10)	93.5% <.001	22	2898/11875	0.28 (0.22, 0.34)	98.8% <.001
<i>Sampling method</i>																
RDS	3	533/1334	0.40 (0.31, 0.50)	92.6% <.001	2	101/930	0.11 (0.05, 0.17)	87.1% .005	2	92/930	0.10 (0.08, 0.12)	0.0% .449	2	88/930	0.09 (0.05, 0.13)	80.1% .025
VBS	16	2760/11422	0.25 (0.20, 0.30)	97.6% <.001	11	1282/7102	0.17 (0.11, 0.24)	98.7% <.001	10	497/6450	0.09 (0.07, 0.12)	93.9% <.001	9	1333/6664	0.20 (0.13, 0.27)	98.5% <.001
Convenience	5	920/2138	0.35 (0.17, 0.54)	98.9% <.001	10	894/7160	0.13 (0.10, 0.17)	96.0% <.001	9	408/6388	0.08 (0.06, 0.10)	92.7% <.001	7	927/2575	0.41 (0.25, 0.57)	98.9% <.001
Multi-Frame	8	1822/4344	0.41 (0.34, 0.47)	94.9% <.001	10	1035/4437	0.23 (0.17, 0.29)	95.3% <.001	6	343/2444	0.14 (0.09, 0.18)	92.7% <.001	10	1772/4526	0.45 (0.26, 0.64)	99.6% <.001
Probability-Based	2	307/635	0.56 (0.11, 1.00)	99.4% <.001	2	667/3299	0.15 (0.01, 0.29)	98.8% <.001	2	187/3299	0.07 (0.03, 0.11)	88.8% .003	2	1027/3299	0.23 (0.00, 0.45)	99.4% <.001
<i>Measurement</i>																
Standardized	19	2913/8853	0.35 (0.27, 0.43)	98.6% <.001	20	1912/10404	0.20 (0.15, 0.24)	98.0% <.001	15	785/8509	0.13 (0.10, 0.16)	95.5% <.001	19	3210/10394	0.36 (0.25, 0.47)	99.5% <.001
By author's	15	3429/11020	0.31 (0.24, 0.39)	98.7% <.001	15	2067/12524	0.14 (0.10, 0.18)	97.6% <.001	14	742/11002	0.07 (0.05, 0.09)	92.5% <.001	11	1937/7600	0.28 (0.18, 0.38)	99.2% <.001
<i>Recall period</i>																
Current	9	1327/4308	0.32 (0.19, 0.45)	99.1% <.001	12	1040/7894	0.15 (0.12, 0.19)	95.9% <.001	10	457/6802	0.09 (0.06, 0.11)	95.2% <.001	8	1275/3431	0.41 (0.30, 0.52)	97.8% <.001
Lifespan	25	5015/15565	0.34 (0.29, 0.39)	98.2% <.001	23	2939/15034	0.18 (0.14, 0.22)	98.3% <.001	19	1070/12709	0.10 (0.08, 0.12)	93.0% <.001	22	3872/14563	0.30 (0.21, 0.39)	99.5% <.001
Overall	34	6342/19873	0.33 (0.28, 0.39)	98.6% <.001	35	3979/22928	0.17 (0.14, 0.20)	97.7% <.001	29	1527/19511	0.09 (0.08, 0.11)	94.4% <.001	30	5147/17994	0.33 (0.25, 0.40)	99.4% <.001

HIC = high-income countries (gross national income per capita >12,535\$); LMIC = low- and middle-income countries (gross national income per capita ≤12,535\$); RDS = random driven sampling; VBS = venue-based sampling.

Table 3. Pooled prevalence of IPV in perpetration among MSM

Subgroup	Any type of violence				Physical violence				Sexual violence				Emotional violence			
	Studies (n)	n/N	Prevalence (95%CI)	I ² (P)	Studies (n)	n/N	Prevalence (95%CI)	I ² (P)	Studies (n)	n/N	Prevalence (95%CI)	I ² (P)	Studies (n)	n/N	Prevalence (95%CI)	I ² (P)
<i>Country income category</i>																
HIC	8	1070/4702	0.27 (0.14, 0.40)	99.6% <.001	13	806/6540	0.16 (0.12, 0.20)	97.8% <.001	10	237/5348	0.05 (0.03, 0.06)	95.9% <.001	7	1155/2530	0.52 (0.27, 0.77)	99.6% <.001
LMIC	3	421/1281	0.34 (0.27, 0.41)	86.0% .001	5	136/2696	0.05 (0.03, 0.07)	83.0% <.001	5	87/2696	0.03 (0.01, 0.05)	92.6% <.001	3	162/1281	0.15 (0.04, 0.26)	97.2% <.001
<i>Year</i>																
2000-2010	1	65/526	0.12 (0.10, 0.15)	- -	3	177/885	0.22 (0.04, 0.40)	97.9% <.001	3	33/885	0.03 (0.00, 0.06)	93.1% <.001	2	352/483	0.68 (0.14, 1.00)	99.6% <.001
2011-2020	10	1426/5457	0.31 (0.18, 0.43)	99.5% <.001	14	765/8351	0.11 (0.08, 0.14)	96.8% <.001	11	291/7159	0.04 (0.03, 0.05)	95.4% <.001	8	965/3328	0.34 (0.19, 0.48)	99.2% <.001
<i>Sampling method</i>																
VBS	5	471/3785	0.16 (0.07, 0.25)	98.7% <.001	4	124/1540	0.12 (0.05, 0.19)	96.5% <.001	4	102/1540	0.09 (0.04, 0.14)	95.1% <.001	2	84/1009	0.09 (0.02, 0.16)	93.0% <.001
Convenience	3	607/1161	0.36 (0.00, 0.77)	99.7% <.001	9	591/6793	0.09 (0.06, 0.12)	97.0% <.001	8	192/6021	0.03 (0.02, 0.04)	94.8% <.001	4	703/1810	0.47 (0.28, 0.65)	98.5% <.001
Multi-Frame	3	413/1037	0.43 (0.29, 0.57)	95.1% <.001	4	227/903	0.25 (0.16, 0.34)	89.5% <.001	2	30/483	0.07 (0.00, 0.20)	96.5% <.001	4	530/992	0.51 (0.12, 0.90)	99.6% <.001
<i>Measurement</i>																
Standardized	11	1491/5983	0.29 (0.17, 0.40)	99.5% <.001	11	650/3768	0.21 (0.14, 0.28)	98.4% <.001	8	243/2576	0.13 (0.08, 0.18)	97.3% <.001	9	1237/3612	0.41 (0.15, 0.66)	99.8% <.001
By author's	0	0/0	-	-	6	292/5468	0.05 (0.04, 0.07)	85.3% <.001	6	81/5468	0.01 (0.01, 0.02)	77.8% <.001	1	80/199	0.40 (0.33, 0.47)	- -
<i>Recall period</i>																
Current	5	880/2075	0.42 (0.12, 0.71)	99.6% <.001	11	723/7527	0.12 (0.09, 0.15)	96.9% <.001	9	243/6435	0.03 (0.02, 0.05)	95.6% <.001	6	881/2319	0.42 (0.29, 0.55)	97.7% <.001
Lifespan	6	611/3908	0.18 (0.08, 0.29)	98.9% <.001	6	219/1709	0.15 (0.08, 0.22)	97.7% <.001	5	81/1609	0.05 (0.02, 0.08)	92.1% <.001	4	436/1492	0.38 (0.00, 0.88)	99.9% <.001
Overall	11	1491/5983	0.29 (0.17, 0.40)	99.5% <.001	17	942/9236	0.12 (0.10, 0.15)	97.1% <.001	14	324/8044	0.04 (0.03, 0.05)	95.0% <.001	10	1317/3811	0.41 (0.17, 0.65)	99.8% <.001

HIC = high-income countries (gross national income per capita >12,535\$); LMIC = low- and middle-income countries (gross national income per capita ≤12,535\$); RDS = random driven sampling; VBS = venue-based sampling.

Table 4. Meta-regression of prevalence of IPV and its forms

Variable	Any type of violence		Physical violence		Sexual violence		Emotional violence		
	P	b	t	P	b	t	P	b	t
Victimization	.698	0.023	0.39	.029*	-0.106	-2.28	.484	-0.034	-0.71
Income category	.666	-0.040	-0.44	.251	-0.060	-1.17	.648	-0.027	-0.46
Year	.026*	-0.058	-2.34	.827	-0.004	-0.22	.877	0.003	0.16
Sampling method	.750	-0.020	-0.32	.926	0.004	0.09	.535	0.029	0.63
Recall period	.714	-0.022	-0.37	.076	-0.070	-1.83	.052	-0.083	-2.03
Measurement	.151	0.206	1.65	.319	-0.070	-1.03	.409	-0.059	-0.85
Perpetration	.638	-0.096	-0.50	.183	-0.142	-1.39	.816	-0.028	-0.24
Income category	.093	-0.144	-2.00	.718	-0.020	0.37	.957	0.004	0.05
Year	.162	0.175	1.59	.213	0.102	1.30	.191	0.123	1.38
Sampling method	-	-	-	0.008*	-0.198	-3.05	0.023*	-0.186	-2.57
Recall period	-	-	-						
Measurement	-	-	-						

*P<.05.

Limitations of This Review and Included Studies

The included studies have several limitations stemming from their methodological weaknesses. Firstly, all studies used cross-sectional design or baseline data from longitudinal studies, which made it difficult to provide an overview of abusive acts among this population within different time points. Secondly, most studies used a non-probabilistic sampling method, such as convenience sampling, venue-based sampling, which makes it difficult to generalize the results to the wider population. Further studies including multiple recruitment strategies might help to yield a more diverse and representative sample. Thirdly, some studies used scales that have been validated for heterosexual samples but not MSM, such as Revised Conflict Tactics Scale (CTS2), National Violence against Women Survey, which did not necessarily capture IPV in MSM, and nearly half of studies used self-made questions without psychometric validation assessment. Fourthly, the recall periods used in some included studies had a wide range, such as “lifetime”, “any time” and “ever”, which hampered the comparison of IPV prevalence across studies. Fifthly, some other factors such as the sexual orientation and sexual identity, severity and frequency of IPV, could not be extracted for analysis in most included studies, leaving substantial heterogeneity between studies unexplained. One previous research demonstrated that compared with those who did not identify themselves as gay or bisexual but with same-sex behavior, men who self-reported gay or homosexual had a higher prevalence of IPV. This means that further differentiated analysis by sexual orientation and identity might help to understand which subgroup of MSM population mainly bearing a burden of IPV better. Sixthly, the intersectionality of gender, sexual identity and sexual orientation were scarce of comprehensive discussion in present studies, which indicated that discussing how gender in interaction with sexual orientation shapes IPV and developing adequate social response for sexual minorities were required. Seventhly, studies written in other than English and Chinese languages were not included for our analysis, which might bias the comprehensive result. Finally, publication bias was found in our study and the result should be interpreted with caution.

Future Research

First, cross-regional and national studies with multiple sampling methods (eg, combining venue-based sampling, convenience sampling and respondent-driven sampling) are needed to get more representative samples to calculate a more reliable prevalence of IPV. Second, it is necessary to adopt the consistent definitions and standardized scales of IPV for the MSM population to produce more reliable prevalence data. Third, the factor of sexual orientation and identity should be clearly detected among MSM, and analysis of IPV should differentiate between the two. Fourth, the IPV perpetration or mutual violence, common in the violence experience among the MSM population in recent studies,^{26,39} should be taken into account in future studies. Fifth, longitudinal studies are needed to be highlighted to establish the

causal relationships between IPV and a multitude of potential influencing factors, which are greatly warranted for intervention development. Sixth, considering the fact that a wide range of recall periods across studies resulted in the inaccurate prevalence estimates, using recent recall periods to measure IPV (eg, 1–5 years) are encouraged in future studies. Seventh, this review highlighted a high prevalence of IPV among MSM, which recalls the need and necessity of violence interventions and treatments. Although previous studies^{85,86} have evidenced the effectiveness of IPV treatments, such as LGB-tailored treatments, couple and group intervention, more adequately targeted assessment in subsequent studies could be conducted.

Implications of Practice

The findings of this review underscore the IPV among same-sex intimate partnership is a serious matter for health service providers, policymakers and legislators. Firstly, to ensure this problem taken into account fully, related education and training programs should be implemented by LGBT-focused service providers and related government settings. The program should include the preventive protocols of IPV for primary prevention, violence-dealing skills in an abusive relationship for secondary prevention, mental interventions for maltreated individuals in tertiary prevention. Secondly, antidiscrimination policies against sexual minorities are needed to change the homophobic context toward sexual orientation and identity. Thirdly, the prevention of IPV in same-sex couples is required to be legislated to effectively prohibit aggressive behaviors and promote the probability for help-seeking among LGBT population.

CONCLUSIONS

Our findings showed a high prevalence of IPV, especially emotional violence, among MSM. The prevalence of IPV seems to be higher when conducting in HIC, using multi-frame recruitment, and using standardized scales. It is a manifestation of this population bear a burden of adverse health and psychological problems. Efforts are needed to develop corresponding prevention programs for victims with an intent to increase the accessible availability of health services, and ultimately improve their life quality.

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Peng Xiong is a ISSM Full member of the International Society for Sexual Medicine.

STATEMENT OF AUTHORSHIP

Peng Xiong: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project Administration, Resources, Software, Supervision, Validation, Visualization, Writing-original draft, Writing-review & editing. Min Liu: Data curation, Formal analysis, Investigation, Methodology, Software, Visualization, Writing-original draft. Xianghao Cai: Writing-original draft. Guang Hao: Writing-review & editing. Wenhao Li: Data curation, Investigation, Methodology. Qingshan Chen: Writing-review & editing. Yuhan Chen: Writing-review & editing.

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SUPPLEMENTARY MATERIALS

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