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ORIGINAL PAPER

Perpetration of Intimate Partner Violence Among Men Living with HIV in Northern Vietnam

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Abstract

We examined the prevalence of intimate partner violence (IPV) perpetration and characteristics of HIV-infected male perpetrators. The cross-sectional study was conducted in Vietnam with male antiretroviral treatment clients (N = 1099; mean age = 40.2 years). Bivariable associations were tested between psychological or physical/sexual IPV perpetration in the last 12 months and sociodemographic, psychosocial, and sexual behavioral factors using prevalence ratios. Factors significant at $p < 0.10$ were entered in multivariable models for each IPV outcome using a modified Poisson approach. Results showed 15.6% (N = 171/1099) reported perpetrating psychological IPV and 7.6% (N = 84/1099) perpetrating physical/sexual IPV in the last 12 months. HIV risk behaviors, including hazardous drinking and multiple sexual partners, having witnessed interparental violence as a child, and depressive symptoms were associated with perpetrating IPV. HIV interventions targeting HIV-infected men in Vietnam should intervene on IPV perpetration by addressing the co-occurring factors of sexual risk, depression, alcohol use, and child maltreatment that are correlated with IPV.

Keywords Intimate partner violence · HIV/AIDS · Global health · Vietnam

Introduction

Intimate partner violence (IPV) is an urgent global health problem. Approximately 30% of women have ever experienced IPV globally, and the prevalence of experiencing IPV in Southeast Asia is one of the highest in the world (38%) [1]. Studies have found the prevalence of IPV perpetration among men ranges from 25 to 50% across various global regions [2–4], with the prevalence ranging from 25 to 80% in Asia and the Pacific [5]. Experiencing IPV can have direct consequences of physical injury and death or indirect consequences, such as substance use and depression [6, 7].

IPV is a major public health issue in Vietnam. A national study found that over half (58%) of married women reported ever experiencing IPV by their husbands, and of these women about a third (34%) reported experiencing physical and/or sexual violence [8]. Thirty-seven percent of men reported having ever perpetrated IPV against their wife [9]. IPV perpetration is largely understudied in Vietnam, especially among unmarried men.

Although research on perpetrators of IPV is limited [5], theoretical and empirical evidence offers insight into potential correlates of IPV perpetration among men in Vietnam. Studies have found that exposure to child maltreatment, including witnessing interparental violence [5, 9–11], harmful use of alcohol and illicit drugs [5, 10–19], depression [5, 10], gender-equitable attitudes [5], attitudes towards IPV [20, 21], and engagement in violence outside the home, including gang involvement and fighting with other men [5, 10, 11], increases the risk of

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IPV perpetration among men. Bandura's social cognitive theory has been commonly applied to IPV perpetration research [22, 23]. The theory suggests that individuals who are exposed to violence in the household and/or in their neighborhood as a child develop normative beliefs around the use of IPV [5, 21, 24]. For example, these individuals may feel that violence is an appropriate way to resolve conflict with a partner. As a result, they are then more likely to perpetrate IPV as an adult [5, 21, 24].

IPV perpetration is associated with HIV infection [25–27]. One study in South Africa found that young men who perpetrated physical IPV were over two times as likely to be HIV-infected as compared to those who had not [25]. Two studies in the United States found a significant association between IPV perpetration and STI/HIV among men [26, 27]. The link between IPV perpetration and HIV is understudied in Asia, although studies in India and Bangladesh found an association between STI or STI symptoms and IPV perpetration [28, 29]. The relationship between IPV perpetration and HIV among men may be explained by the co-occurrence of IPV perpetration with other forms of HIV risk behavior, such as multiple sexual partners, unprotected sex, and transactional sex [26, 27, 30, 31]. This pattern of behavior may be shaped by gender inequality and sociocultural norms dictating that men should demonstrate their masculinity by controlling women and being sexually promiscuous [26, 32–34].

The strong link between IPV and HIV underscores the need to incorporate IPV prevention into HIV prevention efforts [35]. However, most HIV and IPV prevention interventions have engaged women at risk for both HIV and IPV and observed mixed results for HIV and IPV outcomes [35]. Intervention strategies have included community mobilization [36, 37], microfinance programs for women [38], and educational sessions for women, men, or couples [39, 40]. Future interventions should build on the successes of these interventions, but aim to better engage men to achieve large-scale, sustained improvements in IPV and HIV prevention [35, 41, 42]. To develop effective IPV prevention interventions to incorporate into HIV prevention efforts, research on the prevalence and drivers of IPV perpetration among men at high risk for IPV perpetration and HIV is needed.

There is limited research on IPV perpetration among men living with HIV. Men living with HIV are an important group to study because of their high risk for IPV perpetration and HIV transmission to uninfected sexual partners. Studies demonstrate an elevated prevalence of hazardous alcohol use and depression among men living with HIV [43–45], both of which are known correlates of IPV perpetration [5, 10, 11] and other HIV transmission risk factors, such as poor antiretroviral treatment (ART) adherence [46–49] and/or inconsistent condom use [31, 50].

In this study, we aimed to examine the prevalence and correlates of IPV perpetration overall and by marital status among men living with HIV in Vietnam. Potential correlates were selected based on empirical and theoretical evidence with men in the broader population; they include sociodemographic characteristics, psychosocial factors, and sexual behavior [5, 10, 11, 22, 34, 51–53]. We identified correlates of both psychological IPV perpetration and physical and/or sexual IPV perpetration. While the health consequences of experiencing psychological, physical, or sexual IPV are similar [7, 54–56], studies have demonstrated that risk factors may differ by type of IPV perpetration [5]. Further, we conducted sensitivity analyses stratified by marital status to explore whether characteristics of IPV perpetrators differed between those who are married or living with a partner and those who are not. Stratified analyses were conducted as IPV perpetration among unmarried men is understudied in this setting, and IPV prevalence and dynamics are known to differ by relationship status [57, 58]. Study findings will improve understanding on the extent of the problem in a group at high risk for IPV perpetration and forward HIV transmission and may help inform IPV prevention interventions targeting men living with HIV in Vietnam and other global settings.

Methods

This study is a secondary analysis of a cross-sectional study conducted in Thai Nguyen, a semi-urban province in northern Vietnam located approximately 75 km north of Hanoi with a population of 1 million. This paper presents data from a baseline questionnaire that was administered to all participants who were screened for eligibility in a randomized controlled trial (RCT), including those who were later deemed ineligible for enrollment. Individuals were approached for recruitment for an RCT evaluating the effects of two alcohol reduction interventions on alcohol use and viral load among men with HIV and hazardous alcohol use [59].

Recruitment and Data Collection

Individuals were recruited from all seven ART community clinics in Thai Nguyen. All recruitment was exhausted in one clinic, meaning no new ART clients were available for recruitment, before moving on to recruit participants from the next clinic. Clinics were approached for recruitment in a random order. After introducing the project, researchers obtained written informed consent to participate in the baseline questionnaire. Eligibility criteria for participating in the baseline questionnaire included: (1) current ART client at one of the recruitment clinics; (2) interested in participating; and (3) 18 years of age or older.

Trained interviewers administered questionnaires through face-to-face interviews in a private room at an ART clinic. The questionnaire collected data on sociodemographics, HIV medical and treatment history, substance use, sexual behavior, mental health, and violence. For this secondary analysis, the only additional eligibility criterion was that participants who completed the baseline questionnaire identified as male, regardless of sex at birth.

The study protocol received ethical approval from the Institutional Review Boards at the University of North Carolina-Chapel Hill and Thai Nguyen Center for Preventive Medicine.

Key Measures

Psychological, physical, and sexual IPV perpetration in the last 12 months was measured with the six-item shortened Conflict Tactics Scale 2 (CTS2) [60]. The CTS2 has been validated [60] and used with high reliability in Asia, including in Vietnam [61, 62]. All participants were asked to respond to the CTS2 items and to consider any current or previous partner when answering the questions. Psychological IPV perpetration was measured using two items (i.e., *I insulted or swore or shouted or yelled at my partner*); physical IPV perpetration was measured using two items (i.e., *I pushed, shoved, or slapped my partner*); and sexual IPV perpetration was measured using two items (i.e., *I insisted on sex when my partner did not want to or insisted on sex without a condom (but did not use physical force)*). Response options included: "More than once in the past year", "Once in the past year", "Not in the past year, but it did happen before", or "This has never happened." For each item measuring psychological, physical, or sexual IPV perpetration, responses were dichotomized to those who reported IPV perpetration at least once in the past year and those who did not. Those who refused to answer or didn't know the answer were marked as missing. Two binary outcome variables were created using the six-item CTS2: psychological IPV perpetration in the past 12 months; and physical and/or sexual IPV perpetration in the past 12 months. The combined physical and/or sexual IPV perpetration outcome variable was used as the characteristics for both types of IPV are similar in the literature [63]; as a result, it is a commonly used outcome in IPV research, making our findings comparable across similar studies. The physical and/or sexual IPV perpetration variable was also created as the prevalence estimates of physical IPV perpetration in the last 12 months (N = 41, 3.7%) and sexual IPV perpetration in the last 12 months (N = 49, 4.5%) were small, resulting in large confidence intervals for effect estimates.

Psychosocial variables were measured using widely used and validated items or scales; cut-off points for scales were determined based on previous research using the scales in global settings, including in Vietnam [64–72]. Alcohol use was measured using the 10-item alcohol use disorders identification test (AUDIT; Cronbach's alpha = 0.87), and a composite score was calculated for each participant [64, 65]. Those who scored 8 or more were categorized as screening positive for hazardous alcohol use; those who scored 0 to 7 were categorized as screening negative for hazardous alcohol use [64, 65]. The 9-item patient health questionnaire-9 (PHQ-9) scale was used to measure depressive symptoms (Cronbach's alpha = 0.84), and a composite score was calculated for each participant [66–68]. Those who scored 10 or more were categorized as screening positive for severe depressive symptoms; those who scored 5 to 9 were categorized as screening positive for moderate depressive symptoms; and those who scored 0 to 4 were categorized as screening negative for depressive symptoms [66, 67]. The 7-item Generalized Anxiety Disorder (GAD-7) scale was used to measure anxiety symptoms (Cronbach's alpha = 0.90), and a composite score was calculated for each participant [70, 72]. Those who scored 8 or more were categorized as screening positive for anxiety symptoms, and those who scored 0 to 7 were categorized as screening negative for anxiety symptoms [70, 72].

Attitudes towards IPV was measured using one item from the Gender-Equitable Men (GEM) scale: *A woman should tolerate violence in order to keep her family together* [73, 74]. Attitudes towards man-on-man violence was measured using one item from the Violence Approval scale: *A man should not walk away from a physical fight with another man* [75]. Both attitudinal items were scored on a four-point Likert scale from Strongly Disagree to Strongly Agree; responses were then dichotomized as having favorable or unfavorable attitudes towards violence. Witnessing interparental violence as a child [21] was measured using one item: *When you were a child, did you ever see or hear your mother being hit by your father (or her husband or boyfriend)?* Responses were categorized as having witnessed interparental violence as a child or not. Involvement in community violence was measured using two items from the Modified Aggression scale [76] that asked if they had ever experienced or perpetrated physical violence in the community. Response options included: "More than once in the past year", "Once in the past year", "Not in the past year, but it did happen before", or "This has never happened." For each item, responses were dichotomized as reporting involvement in community violence at least once in the past year or not. Exploratory analyses showed that both perpetrating and experiencing community violence were positively associated with the IPV outcomes; both are also known risk factors for IPV perpetration [10, 11, 77, 78]. As a result, we created a composite variable for involvement in community violence.

The remaining potential correlates, including sexual behavior and sociodemographic variables, were also measured using self-report. All sexual behavior variables asked

Table 1 Descriptive statistics of sociodemographic characteristics, psychosocial measures, and sexual behavior among men living with HIV (N = 1099)

	N (%)
Age in years—Mean (SD)	40.2 (6.1)
Highest level of education completed	
None	117 (10.6)
Primary school	363 (33.0)
Secondary school	372 (33.8)
High school	148 (13.5)
Technical training/college or university	99 (9.0)
Employment status	
Employed full- or part-time	828 (75.3)
Unemployed/retired	271 (24.7)
Average weekly income (VND)[a]—Mean (SD)	828591.8 (928208.1)
Marital status	
Married or living with a partner	765 (69.6)
Single	198 (18.0)
Widowed/divorced/separated	136 (12.4)
Hazardous drinking score (range: 0–38)	
Screened negative (score of 0–7)	592 (53.9)
Screened positive (score of 8 or above)	507 (46.1)
Injection drug use in the last 3 months[a]	
No	772 (70.3)
Yes	326 (29.7)
Witnessed interparental violence as a child[a]	
No	795 (72.6)
Yes	300 (27.4)
Attitudes towards IPV[a]	
Unfavorable attitudes	901 (82.3)
Favorable attitudes	194 (17.7)
Attitudes towards man-on-man violence[a]	
Unfavorable attitudes	656 (60.1)
Favorable attitudes	435 (39.9)
Involvement in community violence in the past 12 months	
No	1050 (95.5)
Yes	49 (4.5)
Depressive symptoms score (range: 0–23)[a]	
None (score of 0–4)	815 (74.2)
Moderate (score of 5–9)	207 (18.9)
Severe (score of 10 or above)	76 (6.9)
Anxiety symptoms score (range: 0–21)	
Screened negative (score of 0–7)	1062 (96.6)
Screened positive (score of 8 or above)	37 (3.4)
Number of female sexual partners in the last month[a,b]	
Zero or one	659 (92.6)
Two or more	53 (7.4)
Condom use in the last month with main sexual partner[a,c]	
Always	532 (82.1)
Sometimes	23 (3.5)
Never	93 (14.4)
Involvement in transactional sex in the last month[a,b]	
No	686 (96.3)
Yes	26 (3.7)

Table 1 (continued)

	N (%)
Alcohol use prior to sexual intercourse in the last month[a,b]	
No	462 (64.8)
Yes	251 (35.2)

SD Standard deviation, *VND* Vietnamese Dong, *IPV* intimate partner violence

[a]Missing data due to not knowing or refused to answer: Average weekly income: N = 48; Injection drug use in last 3 months: N = 1; Witnessed interparental violence as a child: N = 4; Attitudes towards IPV: N = 4; Attitudes towards man-on-man violence: N = 8; Depressive symptoms score: N = 1; Number of female sexual partners in last month: N = 3; Condom use in last month with main sexual partner: N = 37; Involvement in transactional sex in last month: N = 3; Alcohol use prior to sexual intercourse in last month: N = 2

[b]Among those who reported having vaginal or anal sex in the last 3 months (N = 715)

[c]Among those who reported having vaginal or anal sex in the last 3 months and those who reported having a main sexual partner (N = 685)

about HIV-related sexual risk behaviors in the last month, including having multiple female sexual partners (defined as having two or more female sexual partners or not), condom use with a main sexual partner (defined as always, sometimes, or never using a condom during sexual intercourse), involvement in transactional sex, and alcohol use prior to sexual intercourse.

Data Analysis

Descriptive and correlational statistical analyses were performed using SAS version 9.4. A total of 1559 participants enrolled in the study. Men with missing data on IPV outcomes (N = 12/1559), women (N = 438/1559), and those with missing data on gender (N = 10/1559) were removed from the analysis, resulting in a sample size of 1099 male participants. We report frequencies and percentages for categorical variables and means with standard deviation (SD) for continuous variables. We tested bivariable associations between the two IPV perpetration outcomes and potential risk factors using prevalence ratios (PRs) and 95% Confidence Intervals (CIs).

We built a multivariable model for each IPV outcome. Variables that were significantly associated with an IPV outcome at $p < 0.10$ in bivariable analyses were included in the outcome's final multivariable model. Adjusted prevalence ratios (aPRs) and 95% CIs were calculated using a modified Poisson approach with robust error variances for all models [79].

Finally, as a sensitivity analysis, we stratified the bivariable and multivariable analyses by marital status. This allowed us to assess whether significant correlates differed for those who reported being married or living with a partner (N = 765) versus those who reported being single, widowed, divorced, or separated (N = 334).

Results

The sample comprised 1099 men living with HIV (Table 1). The mean age of participants was 40.2 years (SD = 6.1). Three quarters of the sample were employed full- or part-time (N = 828; 75.3%), and the majority were married or living with a partner (N = 765; 69.6%). Less than half screened positive for hazardous alcohol use (N = 507; 46.1%), and a quarter of participants screened positive for moderate (N = 207; 18.9%) or severe (N = 76; 6.9%) depressive symptoms. For attitudes towards violence, 17.7% (N = 194) reported favorable attitudes towards IPV, and 39.9% (N = 435) reported favorable attitudes towards man-on-man violence. Over a quarter of participants (N = 300; 27.4%) reported witnessing interparental violence as a child. The median duration of years since HIV diagnosis was 7.0 years (SD 4.0).

Over half of participants had ever perpetrated any form of IPV (N = 603; 54.9%), with psychological IPV perpetration (N = 517; 47.0%) more prevalent than physical and/or sexual IPV perpetration (N = 414; 37.7%; Table 2). Approximately 18.6% of participants had perpetrated any form of IPV in the last 12 months (N = 204). Psychological IPV perpetration in the last 12 months was over twice as prevalent (N = 171; 15.6%) as physical and/or sexual IPV perpetration in the last 12 months (N = 84; 7.6%). All IPV perpetration prevalence estimates were higher among those who reported being married or living with a partner versus those who reported being single, widowed, divorced, or separated.

Bivariable Analyses

Psychological IPV Perpetration

Of the sociodemographic variables, only marital status was significantly associated with psychological IPV perpetration

Table 2 Prevalence of intimate partner violence (IPV) perpetration ever and in the last 12 months

	Full sample (N = 1099) [N (%)]	Married or living with a partner (N = 765) [N (%)]	Single, widowed, divorced, or separated (N = 334) [N (%)]
Psychological intimate partner violence (IPV) perpetration ever			
No	582 (53.0)	352 (46.0)	230 (68.9)
Yes	517 (47.0)	413 (54.0)	104 (31.1)
Physical and/or sexual IPV perpetration ever			
No	685 (62.3)	449 (58.7)	236 (70.7)
Yes	414 (37.7)	316 (41.3)	98 (29.3)
Any form of IPV perpetration ever			
No	496 (45.1)	297 (38.8)	199 (59.6)
Yes	603 (54.9)	468 (61.2)	135 (40.4)
Psychological IPV perpetration in the last 12 months			
No	928 (84.4)	609 (79.6)	319 (95.5)
Yes	171 (15.6)	156 (20.4)	15 (4.5)
Physical and/or sexual IPV perpetration in the last 12 months			
No	1015 (92.4)	696 (91.0)	319 (95.5)
Yes	84 (7.6)	69 (9.0)	15 (4.5)
Any form of IPV perpetration in the last 12 months			
No	895 (81.4)	584 (76.3)	311 (93.1)
Yes	204 (18.6)	181 (23.7)	23 (6.9)

in the last 12 months (Table 3). Individuals who were single (PR 0.17, 95% CI 0.08, 0.36, $p < 0.0001$) or widowed/divorced/separated (PR 0.29, 95% CI 0.15, 0.57, $p = 0.0004$) were less likely to perpetrate psychological IPV in the last 12 months compared to those who were married or living with a partner.

Hazardous drinking (PR 2.00, 95% CI 1.50, 2.67, $p < 0.0001$), having depressive symptoms (Moderate: PR 1.74, 95% CI 1.28, 2.38, $p = 0.0005$; Severe: PR 2.06, 95% CI 1.36, 3.13, $p = 0.0007$), having witnessed interparental violence as a child (PR 1.68, 95% CI 1.27, 2.22, $p = 0.0003$), and involvement in community violence in the last 12 months (PR 2.52, 95% CI 1.70, 3.74, $p < 0.0001$) were positively associated with psychological IPV perpetration in the last 12 months. The only sexual behavior variable significantly associated with psychological IPV perpetration in the last 12 months was alcohol use prior to sexual intercourse in the last month (PR 1.74, 95% CI 1.31, 2.31, $p = 0.0001$).

Physical and/or Sexual IPV Perpetration

Age and marital status were both significantly associated with physical and/or sexual IPV perpetration in the last 12 months. Younger men were more likely to perpetrate physical and/or sexual IPV compared to older men ($t = 2.29$, $p = 0.02$). Single men were less likely to perpetrate physical and/or sexual IPV compared to men that were married or living with a partner (PR 0.39, 95% CI 0.18, 0.84, $p = 0.02$).

Hazardous drinking (PR 1.63, 95% CI 1.08, 2.48, $p = 0.02$), injection drug use in the last three months (PR 1.53, 95% CI 1.01, 2.33, $p = 0.04$), depressive symptoms (Moderate: PR 2.19, 95% CI 1.37, 3.48; $p = 0.001$; Severe: PR 3.10, 95% CI 1.75, 5.48, $p = 0.0001$), anxiety symptoms (PR 3.44, 95% CI 1.87, 6.33, $p = 0.0001$), having witnessed interparental violence as a child (PR 3.14, 95% CI 2.08, 4.73), favorable attitudes towards IPV (PR = 2.00, 95% CI 1.29, 3.12, $p = 0.002$), and involvement in community violence in the last 12 months (PR 4.29, 95% CI 2.61, 7.05, $p < 0.0001$) were positively associated with physical and/or sexual IPV perpetration in the last 12 months. Of the sexual behavior variables, having multiple sexual partners in the last month (PR 3.01, 95% CI 1.84, 4.91, $p < 0.0001$) and alcohol use prior to sexual intercourse in the last month (PR 2.45, 95% CI 1.61, 3.75, $p < 0.0001$) were significantly associated with physical and/or sexual IPV perpetration in the last 12 months.

Table 3 Bivariable analyses for correlates of intimate partner violence (IPV) outcomes among men living with HIV (N = 1099)

	Psychological IPV in past 12 months				Physical and/or sexual IPV in past 12 months			
	Yes (N = 171)	No (N = 928)	PR, 95% CI	p-value	Yes (N = 84)	No (N = 1015)	PR, 95% CI	p-value
Age in years—Mean (SD)	39.84 (6.09)	40.30 (6.15)	t = 0.87	0.38	38.75 (5.63)	40.35 (6.17)	**t = 2.29**	**0.02**
Highest level of education								
Technical training/college or university	18 (10.53)	81 (8.73)	Ref	Ref	8 (9.52)	91 (8.97)	Ref	Ref
High school	22 (12.87)	126 (13.58)	0.82 (0.46, 1.44)	0.49	10 (11.90)	138 (13.60)	0.84 (0.34, 2.04)	0.69
Secondary school	51 (29.82)	321 (34.59)	0.75 (0.46, 1.23)	0.26	23 (27.38)	349 (34.38)	0.77 (0.35, 1.66)	0.50
Primary school	67 (39.18)	296 (31.90)	1.02 (0.63, 1.63)	0.95	34 (40.48)	329 (32.41)	1.16 (0.55, 2.42)	0.69
None	13 (7.60)	104 (11.21)	0.61 (0.32, 1.18)	0.14	9 (10.71)	108 (10.64)	0.95 (0.38, 2.37)	0.92
Employment status								
Employed full- or part-time	127 (74.27)	701 (75.54)	Ref	Ref	61 (72.62)	767 (75.57)	Ref	Ref
Unemployed/retired	44 (25.73)	227 (24.46)	1.06 (0.77, 1.45)	0.72	23 (27.38)	248 (24.43)	1.15 (0.73, 1.82)	0.55
Average weekly income (VND)—Mean (SD)	803,625 (738,856)	833,075 (958,540)	t = 0.44	0.66	838,228 (740,772)	827,809 (942,114)	t = − 0.12	0.91
Marital status								
Married/living with a partner	156 (91.23)	609 (65.63)	Ref	Ref	69 (82.14)	696 (68.57)	Ref	Ref
Single	7 (4.09)	191 (20.58)	**0.17 (0.08, 0.36)**	**< 0.0001**	7 (8.33)	191 (18.82)	**0.39 (0.18, 0.84)**	**0.02**
Widowed/divorced/separated	8 (4.68)	128 (13.79)	**0.29 (0.15, 0.57)**	**0.0004**	8 (9.52)	128 (12.61)	0.65 (0.32, 1.33)	0.24
Hazardous drinking score (range: 0–38)								
Screened negative (score of 0–7)	63 (36.84)	529 (57.00)	Ref	Ref	35 (41.67)	557 (54.88)	Ref	Ref
Screened positive (score of 8 or above)	108 (63.16)	399 (43.00)	**2.00 (1.50, 2.67)**	**< 0.0001**	49 (58.33)	458 (45.12)	**1.63 (1.08, 2.48)**	**0.02**
Injection drug use in the last 3 months								
No	116 (67.84)	656 (70.77)	Ref	Ref	51 (60.71)	721 (71.10)	Ref	Ref
Yes	55 (32.16)	271 (29.23)	1.12 (0.84, 1.51)	0.44	33 (39.29)	293 (28.90)	**1.53 (1.01, 2.33)**	**0.04**
Witnessed interparental violence as a child								
No	104 (61.18)	691 (74.70)	Ref	Ref	38 (45.78)	757 (74.80)	Ref	Ref
Yes	66 (38.82)	234 (25.30)	**1.68 (1.27, 2.22)**	**0.0003**	45 (54.22)	255 (25.20)	**3.14 (2.08, 4.73)**	**< 0.0001**
Attitudes towards IPV								
Unfavorable attitudes	136 (80.00)	765 (82.70)	Ref	Ref	58 (69.88)	843 (83.30)	Ref	Ref

Table 3 (continued)

	Psychological IPV in past 12 months				Physical and/or sexual IPV in past 12 months			
	Yes (N = 171)	No (N = 928)	PR, 95% CI	p-value	Yes (N = 84)	No (N = 1015)	PR, 95% CI	p-value
Favorable attitudes	34 (20.00)	160 (17.30)	1.16 (0.82, 1.64)	0.40	25 (30.12)	169 (16.70)	**2.00 (1.29, 3.12)**	**0.002**
Attitudes towards man-on-man violence								
Unfavorable attitudes	110 (65.48)	546 (59.15)	Ref	Ref	56 (68.29)	600 (59.46)	Ref	Ref
Favorable attitudes	58 (34.52)	377 (40.85)	0.80 (0.59, 1.07)	0.12	26 (31.71)	409 (40.54)	0.70 (0.45, 1.10)	0.12
Involvement in community violence in last 12 months								
No	153 (89.47)	897 (96.66)	Ref	Ref	70 (83.33)	980 (96.55)	Ref	Ref
Yes	18 (10.53)	31 (3.34)	**2.52 (1.70, 3.74)**	**< 0.0001**	14 (16.67)	35 (3.45)	**4.29 (2.61, 7.05)**	**< 0.0001**
Depressive symptoms score (range: 0–23)								
None (score of 0–4)	104 (61.18)	711 (76.62)	Ref	Ref	45 (54.22)	770 (75.86)	Ref	Ref
Moderate (score of 5–9)	46 (27.06)	161 (17.35)	**1.74 (1.28, 2.38)**	**0.0005**	25 (30.12)	182 (17.93)	**2.19 (1.37, 3.48)**	**0.001**
Severe (score of 10 or above)	20 (11.76)	56 (6.03)	**2.06 (1.36, 3.13)**	**0.0007**	13 (15.66)	63 (6.21)	**3.10 (1.75, 5.48)**	**0.0001**
Anxiety symptoms score (range: 0–21)								
Screened negative (score of 0–7)	162 (94.74)	900 (96.98)	Ref	Ref	75 (89.29)	987 (97.24)	Ref	Ref
Screened positive (score of 8 or above)	9 (5.26)	28 (3.02)	1.59 (0.89, 2.86)	0.13	9 (10.71)	28 (2.76)	**3.44 (1.87, 6.33)**	**0.0001**
Number of female sexual partners in last month[a]								
Zero or one	135 (91.22)	524 (92.91)	Ref	Ref	62 (80.52)	597 (94.02)	Ref	Ref
Two or more	13 (8.78)	40 (7.09)	1.20 (0.73, 1.97)	0.49	15 (19.48)	38 (5.98)	**3.01 (1.84, 4.91)**	**< 0.0001**
Condom use in last month with main sexual partner[b]								
Always	112 (81.16)	420 (82.35)	Ref	Ref	57 (78.08)	475 (82.61)	Ref	Ref
Sometimes	4 (2.90)	19 (3.73)	0.83 (0.33, 2.04)	0.68	3 (4.11)	20 (3.48)	1.22 (0.41, 3.60)	0.72
Never	22 (15.94)	71 (13.92)	1.12 (0.75, 1.68)	0.57	13 (17.81)	80 (13.91)	1.30 (0.74, 2.29)	0.35
Involvement in transactional sex in last month[a]								
No	144 (97.30)	542 (96.10)	Ref	Ref	73 (94.81)	613 (96.54)	Ref	Ref
Yes	4 (2.70)	22 (3.90)	0.73 (0.29, 1.83)	0.49	4 (5.19)	22 (3.46)	1.45 (0.57, 3.65)	0.44
Alcohol use prior to sexual intercourse in last month[a]								
No	76 (51.35)	386 (68.32)	Ref	Ref	33 (42.86)	429 (67.45)	Ref	Ref
Yes	72 (48.65)	179 (31.68)	**1.74 (1.31, 2.31)**	**0.0001**	44 (57.14)	207 (32.55)	**2.45 (1.61, 3.75)**	**< 0.0001**

Bivariable associations significant at $p < 0.05$ are highlighted in bold

IPV Intimate partner violence, *PR* prevalence ratio, *CI* confidence interval, *SD* standard deviation, *Ref* reference group, *VND* Vietnamese Dong

[a]Restricted to those who reported having vaginal or anal sex in the last 3 months (N = 715)

[b]Restricted to those who reported having vaginal or anal sex in the last 3 months and those who reported having a main partner (N = 685)

Table 4 Multivariable models for IPV outcomes (N = 1099)

	Psychological IPV in past 12 months		Physical and/or sexual IPV in past 12 months	
	aPR (95% CI)	p-value	aPR (95% CI)	p-value
Age in years	–	–	1.04 (1.00, 1.08)	0.07
Marital status				
Married/living with a partner	Ref	Ref	Ref	Ref
Single	0.64 (0.32, 1.29)	0.21	0.97 (0.45, 2.07)	0.93
Widowed/divorced/separated	0.72 (0.36, 1.46)	0.37	0.95 (0.45, 2.01)	0.88
Hazardous drinking score (range: 0–38)				
Screened negative (score of 0–7)	Ref	Ref	Ref	Ref
Screened positive (score of 8 or above)	**1.45 (1.04, 2.02)**	**0.03**	0.98 (0.61, 1.56)	0.92
Injection drug use in the last 3 months				
No	–	–	Ref	Ref
Yes	–	–	1.41 (0.91, 2.19)	0.12
Witnessed interparental violence as a child				
No	Ref	Ref	Ref	Ref
Yes	**1.51 (1.13, 2.02)**	**0.005**	**2.29 (1.45, 3.61)**	**0.0004**
Involvement in community violence in last 12 months				
No	Ref	Ref	Ref	Ref
Yes	**1.76 (1.20, 2.60)**	**0.004**	1.32 (0.61, 2.85)	0.48
Attitudes towards IPV				
Unfavorable attitudes	–	–	Ref	Ref
Favorable attitudes	–	–	**1.70 (1.06, 2.74)**	**0.03**
Depressive symptoms score (range: 0–23)				
None (score of 0–4)	Ref	Ref	Ref	Ref
Moderate (score of 5–9)	**1.70 (1.24, 2.32)**	**0.001**	**1.71 (1.07, 2.75)**	**0.03**
Severe (score of 10 or above)	**1.78 (1.09, 2.90)**	**0.02**	**2.70 (1.50, 4.89)**	**0.001**
Anxiety symptoms score (range: 0–21)				
Screened negative (score of 0–7)	–	–	Ref	Ref
Screened positive (score of 8 or above)	–	–	1.32 (0.57, 3.07)	0.52
Number of female sexual partners in last month[a]				
Zero or one	–	–	Ref	Ref
Two or more	–	–	**2.15 (1.26, 3.68)**	**0.005**
Alcohol use prior to sexual intercourse in last month[a]				
No	Ref	Ref	Ref	Ref
Yes	1.27 (0.93, 1.74)	0.13	**1.74 (1.07, 2.82)**	**0.03**

Multivariable associations significant at $p < 0.05$ are highlighted in bold

IPV Intimate partner violence, *aPR* adjusted prevalence ratio, *CI* confidence interval, *Ref* Reference group

[a]Restricted to those who reported having vaginal or anal sex in the last 3 months (N = 715)

Multivariable Analyses

For the multivariable model for psychological IPV perpetration in the last 12 months, hazardous drinking (aPR 1.45, 95% CI 1.04, 2.02, p = 0.03), having witnessed interparental violence as a child (aPR 1.51, 95% CI 1.13, 2.02, p = 0.005), involvement in community violence in the last 12 months (aPR 1.76, 95% CI 1.20, 2.60, p = 0.004), and having depressive symptoms (Moderate: aPR 1.70, 95% CI 1.24, 2.32, p = 0.001; Severe: aPR 1.78, 95% CI 1.09, 2.90, p = 0.02) remained significant (Table 4).

For physical and/or sexual IPV perpetration in the last 12 months, having witnessed interparental violence as a child (aPR 2.29, 95% CI 1.45, 3.61, p = 0.0004), favorable attitudes towards IPV (aPR 1.70, 95% CI 1.06, 2.74, p = 0.03), having depressive symptoms (Moderate: aPR 1.71, 95% CI 1.07, 2.75, p = 0.03; Severe: aPR 2.70, 95% CI 1.50, 4.89, p = 0.001), having multiple sexual partners (aPR 2.15, 95% CI 1.26, 3.68, p = 0.005), and alcohol

Table 5 Sensitivity analysis: Multivariable analyses for those who reported being married or living with a partner (N = 765)

	Psychological IPV in past 12 months		Physical and/or sexual IPV in past 12 months	
	aPR (95% CI)	p-value	aPR (95% CI)	p-value
Age in years	1.02 (0.99, 1.05)	0.11	1.03 (0.99, 1.08)	0.13
Highest level of education				
Technical training/college or university	Ref	Ref	–	–
High school	1.13 (0.62, 2.06)	0.69	–	–
Secondary school	0.94 (0.53, 1.68)	0.84	–	–
Primary school	0.99 (0.57, 1.73)	0.99	–	–
None	0.53 (0.22, 1.25)	0.15	–	–
Average weekly income (VND)	1.00 (1.00, 1.00)	0.08	–	–
Hazardous drinking score (range: 0–38)				
Screened negative (score of 0–7)	Ref	Ref	–	–
Screened positive (score of 8 or above)	**1.51 (1.06, 2.17)**	**0.02**	–	–
Injection drug use in the last 3 months				
No	Ref	Ref	Ref	Ref
Yes	1.11 (0.81, 1.53)	0.51	1.48 (0.92, 2.38)	0.10
Witnessed interparental violence as a child				
No	Ref	Ref	Ref	Ref
Yes	**1.63 (1.19, 2.22)**	**0.002**	**2.14 (1.29, 3.53)**	**0.003**
Involvement in community violence in last 12 months				
No	Ref	Ref	Ref	Ref
Yes	**1.64 (1.10, 2.46)**	**0.02**	1.18 (0.50, 2.80)	0.71
Attitudes towards IPV				
Unfavorable attitudes	–	–	Ref	Ref
Favorable attitudes	–	–	**1.88 (1.15, 3.06)**	**0.01**
Depressive symptoms score (range: 0–23)				
None (score of 0–4)	Ref	Ref	Ref	Ref
Moderate (score of 5–9)	**1.55 (1.10, 2.20)**	**0.01**	**1.92 (1.15, 3.21)**	**0.01**
Severe (score of 10 or above)	**1.70 (1.03, 2.80)**	**0.04**	**2.85 (1.47, 5.53)**	**0.002**
Anxiety symptoms score (range: 0–21)				
Screened negative (score of 0–7)	–	–	Ref	Ref
Screened positive (score of 8 or above)	–	–	1.47 (0.61, 3.52)	0.39
Number of female sexual partners in last month[a]				
Zero or one	–	–	Ref	Ref
Two or more	–	–	**2.33 (1.24, 4.38)**	**0.009**
Alcohol use prior to sexual intercourse in last month[a]				
No	Ref	Ref	Ref	Ref
Yes	1.15 (0.82, 1.62)	0.41	1.62 (0.99, 2.62)	0.05

Multivariable associations significant at $p < 0.05$ are highlighted in bold

IPV Intimate partner violence, *aPR* adjusted prevalence ratio, *CI* confidence interval, *Ref* reference group, *VND* Vietnamese Dong

[a]Restricted to those who reported having vaginal or anal sex in the last 3 months (N = 715)

use prior to sexual intercourse in the last month (aPR 1.74, 95% CI 1.07, 2.82, p = 0.03) remained significant.

Sensitivity Analysis

When the bivariable and multivariable analyses were stratified by marital status, significant correlates for those who reported being married or living with a partner were largely similar to the analyses with the full sample (Table 5). The only difference was that the relationship between alcohol use prior to sexual intercourse and physical and/or sexual IPV in the last 12 months became non-significant (aPR 1.62, 95% CI 0.99, 2.62, p = 0.05).

Table 6 Sensitivity analysis: Multivariable analyses for those who reported being single, widowed, divorced, or separated (N = 334)

	Psychological IPV in past 12 months		Physical and/or sexual IPV in past 12 months	
	aPR (95% CI)	p value	aPR (95% CI)	p value
Age in years	–	–	1.05 (0.94, 1.17)	0.42
Hazardous drinking score (range: 0–38)				
Screened negative (score of 0–7)	Ref	Ref	Ref	Ref
Screened positive (score of 8 or above)	1.72 (0.56, 5.34)	0.35	1.24 (0.27, 5.65)	0.78
Witnessed interparental violence as a child				
No	–	–	Ref	Ref
Yes	–	–	**3.11 (1.07, 8.99)**	**0.04**
Involvement in community violence in last 12 months				
No	–	–	Ref	Ref
Yes	–	–	3.58 (0.30, 42.72)	0.31
Attitudes towards IPV				
Unfavorable attitudes	Ref	Ref	–	–
Favorable attitudes	2.55 (0.92, 7.04)	0.07	–	–
Depressive symptoms score (range: 0–23)				
None (score of 0–4)	Ref	Ref	–	
Moderate (score of 5–9)	1.81 (0.66, 4.95)	0.25	–	–
Severe (score of 10 or above)	3.01 (0.61, 14.71)	0.17	–	–
Anxiety symptoms score (range: 0–21)				
Screened negative (score of 0–7)	Ref	Ref	–	–
Screened positive (score of 8 or above)	1.91 (0.63, 5.78)	0.25	–	–
Alcohol use prior to sexual intercourse in last month[a]				
No	Ref	Ref	Ref	Ref
Yes	1.54 (0.60, 3.95)	0.37	**3.59 (1.15, 11.18)**	**0.03**

Multivariable associations significant at $p < 0.05$ are highlighted in bold

IPV Intimate partner violence, *aPR* adjusted prevalence ratio, *CI* confidence interval, *Ref* reference group

[a]Restricted to those who reported having vaginal or anal sex in the last 3 months (N = 715)

In the multivariable analyses for those who reported being single, widowed, divorced, or separated, results differed substantially when compared to the analyses with the full sample. No factors were significantly associated with psychological IPV perpetration in the last 12 months (Table 6). Additionally, having witnessed interparental violence as a child (aPR 3.11, 95% CI 1.07, 8.99, p = 0.04) and alcohol use prior to sexual intercourse in the last month (aPR 3.59, 95% CI 1.15, 11.18, p = 0.03) were the only factors significantly associated with physical and/or sexual IPV perpetration in the last 12 months.

Discussion

To our knowledge, this is the first study to investigate the prevalence of and factors associated with IPV perpetration among a sample of men living with HIV. It was challenging to compare prevalence estimates across Vietnam studies as the measures often differed and no studies estimated prevalence among unmarried men [9, 21, 61]. In a regional study on IPV perpetration in Asia and the Pacific, the lifetime prevalence of physical and/or sexual IPV perpetration ranged from 25 to 80% [5]. The prevalence estimate found in our study was 38%. While IPV perpetration prevalence estimates were expectedly lower among those who were single, divorced, widowed, or separated, IPV perpetration remained prevalent. Future IPV research in Vietnam should include unmarried men to better understand the extent of the problem in this group.

Results showed that having multiple sexual partners, depressive symptoms, and hazardous drinking were significantly associated with IPV perpetration; all of these are also HIV transmission risk factors as they are associated with inconsistent condom use and/or poor ART adherence [5, 10, 11, 44, 47, 80–83]. The findings are consistent with research in Vietnam and other settings showing that HIV risk behaviors, including IPV perpetration, often co-occur among men, thereby increasing the risk of HIV infection and/or transmission [11, 26, 27, 30, 31]. This pattern of intersecting behavior demonstrates that men living with HIV are at heightened risk for forward HIV transmission, especially due to the

elevated prevalence of depressive symptoms and hazardous drinking in this group [43–45]. While there are longitudinal studies establishing that alcohol use leads to IPV perpetration [84, 85], further research is needed to understand how these other HIV risk behaviors relate to IPV perpetration over time [86].

The associations between hazardous drinking, depressive symptoms, and sexual risk behavior with IPV perpetration demonstrate the importance of addressing co-occurring HIV risk behaviors through IPV prevention interventions for men living with HIV [26, 32–34, 42]. There is limited evidence of effective IPV prevention interventions targeting our study population. However, research with other high-risk groups, such as men with alcohol dependence, suggests that incorporating psychosocial counseling that addresses IPV perpetration, hazardous drinking, and depression into HIV care and treatment may help reduce IPV perpetration and other overlapping HIV transmission risk behaviors [15, 17, 87–89].

Our analyses demonstrated that significant correlates differed slightly by type of IPV and substantially by marital status. In the multivariable models for the full sample, having witnessed interparental violence as a child and having moderate or severe depressive symptoms were the shared significant factors for both IPV outcomes. Hazardous drinking and involvement in community violence were unique correlates for psychological IPV perpetration. Favorable attitudes towards IPV, having multiple sexual partners, and alcohol use prior to sexual intercourse were unique correlates for physical and/or sexual IPV perpetration. For the stratified analyses, the multivariable models for those who reported being married or living with a partner had the same significant correlates as the models with the full sample, with the exception that alcohol use prior to sexual intercourse was not significantly associated with physical and/or sexual IPV perpetration. The multivariable models for those who reported being single, widowed, divorced, or separated were different from the models with the full sample. In fact, no factors were significant in the psychological IPV perpetration model, and the only significant factors in the physical and/or sexual IPV perpetration model were having witnessed interparental violence as a child and alcohol use prior to sexual intercourse. These diverging results among those who are single, widowed, divorced, or separated may be due to the diversity of the sub-group.

Alcohol use-related variables, including hazardous drinking and alcohol use prior to sexual intercourse, were significant risk factors across multivariable models. This is consistent with previous Vietnam research with the broader population showing that husband's alcohol use is associated with women's experience of IPV [11]. Hazardous drinking was associated with psychological IPV perpetration in the multivariable model with the full sample. In the stratified analyses, however, hazardous drinking only remained significant in the model for those who reported being married or living with a partner. Qualitative research among women living with HIV in northern Vietnam suggests that male partners living with HIV often come home from a night of drinking and quarrel with or yell at their partners [13]. This finding is also supported by empirical and theoretical evidence showing that a pattern of problem drinking may lead to relationship conflict, which then leads to IPV [90–92]. Additionally, alcohol use prior to sexual intercourse was significantly associated with physical and/or sexual IPV perpetration in the multivariable model with the full sample. When results were stratified, the factor only remained statistically significant in the model for those who reported being single, widowed, divorced, or separated. This relationship may be explained by the immediate intoxication effects of alcohol consumption, such as lowered inhibitions or distorted perceptions of cues, which can lead to IPV perpetration [84, 85, 93]. These findings suggest that alcohol use may increase risk of both psychological and physical and/or sexual IPV perpetration among men living with HIV, though the pathways through which alcohol use leads to IPV perpetration may differ by type of IPV and relationship status.

Depressive symptoms and having witnessed interparental violence as a child were identified as important characteristics of men who perpetrate IPV. Exposure to interparental violence as a child is a well-documented risk factor for IPV perpetration, including in Vietnam [21, 52, 94–96]. Bandura's social cognitive theory is often used to explain the relationship between exposure to violence as a child and IPV perpetration. Social cognitive theory posits that children who witness interparental violence develop accepting attitudes towards the use of IPV and later model the violent behavior as adults [22, 53]. However, other theorists assert that social cognitive theory does not adequately address the role of gender when explaining the intergenerational transmission of violence [97]. Vietnamese culture is influenced greatly by the philosophy and religion of Confucianism, which is characterized by patriarchy and gendered family roles [98–100]. As men are expected to be in control of their wife and family, violence may be a learned behavior used to maintain superiority [9, 98, 99]. In particular, men living with HIV may use violence because they feel they are losing authority due to HIV-related stigma and discrimination, loss of employment, or lack of social support [13, 101].

Notably, in our analysis, favorable attitudes towards IPV was only found to be significantly associated with physical and/or sexual IPV perpetration in bivariable and multivariable analyses. As other research in Vietnam does not examine psychological IPV perpetration as an outcome, we are not able to compare our findings to other studies [9, 21]. Favorable attitudes towards IPV may not have been associated with psychological IPV perpetration because it is highly normative, as evidenced by the particularly high prevalence

estimates in our study. For men, being assertive and even aggressive is seen as necessary to maintain a superior position over their wife and family in Vietnam [98, 99]. Thus, participants who reported unfavorable attitudes towards IPV may not have understood the description of psychological IPV to be a form of violence. IPV prevention interventions in Vietnam may need to consider men's nuanced views on different forms of IPV and how that may influence behavior change. These interventions may also need to address anger with emotion regulation or anger management training [102–104], especially as men living with HIV may experience feelings of anger or hostility due to their HIV infection [105]. Additionally, attitudes towards IPV was only measured using one item from a multi-item scale, suggesting that the variable may not have been accurately measured [73]. Utilizing the full, validated scale measuring gender-equitable attitudes may better capture the construct in future research [73].

The strong associations between having witnessed interparental violence as a child and IPV perpetration suggest that interventions for men living with HIV in Vietnam are needed to disrupt the intergenerational transmission of violence. There is limited research on child maltreatment interventions for men living with HIV. Integrating screenings for child maltreatment history into HIV care and treatment may be beneficial. Research with other populations suggests that offering psychosocial counseling on past traumatic experiences as part of alcohol treatment and other prevention programs for people living with HIV may be an effective approach to utilize [88, 106].

While the literature strongly supports the relationship between exposure to violence as a child and IPV perpetration, the relationship between depressive symptoms and IPV perpetration is not as well established, especially in Vietnam [5, 43, 107, 108]. Since mental health issues often manifest as internalized anger and may lead to self-control impairment, experiencing depressive symptoms may increase risk for aggressive behavior [102, 109–111]. Depression is common among men living with HIV [44]; one Vietnam study found that 44% of HIV-infected men who inject drugs reported severe depressive symptoms [43]. As men living with HIV face numerous psychosocial stressors, such as unemployment, lack of support, and stigma and discrimination, they are particularly vulnerable to developing depressive symptoms [44], which may increase their risk of IPV perpetration. Notably, depressive symptoms were not significantly associated with IPV outcomes in the multivariable models for those who reported being single, widowed, divorced, or separated. This suggests that individuals in stable, long-term relationships may face unique stressors that other individuals do not. Having a low-quality relationship defined by poor communication and conflict with a stable, long-term intimate partner may increase risk for depressive symptoms and IPV perpetration [102]. Prior findings suggest that intervening on depression may reduce IPV perpetration among men living with HIV who are married or living with a partner [104]. Future studies should measure anger and relationship quality to examine if these factors explain the depressive symptoms-IPV relationship.

Generalizability of our findings to men living with HIV across Vietnam is limited as participants were only recruited from one province in Vietnam. Participants were also recruited from ART clinics, demonstrating that the sample represents men living with HIV who are aware of their HIV status and are on ART. We are not able to conclude that all participants had female sexual partners or that all participants' main partners were female due to missing data (N = 415/1099). However, among the available data (N = 684/1099), all participants reported having female sexual partners and/or female main partners, including two participants who reported having both female and male sexual partners in the last month. Further, as cross-sectional research cannot establish temporality, longitudinal research is needed to determine the direction of causality between factors and IPV perpetration over time. However, IPV perpetration is understudied globally, especially among men living with HIV, and this study provides valuable insights that will guide future research and intervention development.

As all variables were measured using self-report, responses may have been biased due to social desirability, leading to more conservative estimates of IPV perpetration. Additionally, as IPV research is limited in Vietnam, measures may not have accurately captured the dynamics of IPV in this context. Despite these limitations, the scale used to measure IPV perpetration, CTS2, is a reliable tool as it has been widely used in global settings, including in Vietnam [61].

Conclusions

Overall, our study underscores the need to incorporate IPV prevention activities into HIV interventions for men living with HIV. Our findings also suggest that IPV perpetration among men living with HIV does not occur in isolation and is influenced by co-occurring psychosocial and behavioral factors, such as sexual risk behavior, alcohol use, depression, and exposure to interparental violence as a child [112, 113]. Incorporating screening for IPV prevention, alcohol reduction, and mental health services into HIV care and treatment may address critical public health problems for men living with HIV and reduce HIV transmission risk [14, 15, 18, 44, 104, 114–117]. A multifaceted approach is needed to prevent IPV perpetration and forward HIV transmission among men living with HIV.

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References

1. World Health Organization. Global and regional estimates of violence against women: prevalence and health effects of intimate partner violence and non-partner sexual violence. Geneva, Switzerland: World Health Organization; 2013.
2. Barker G, Contreras M, Heilman B, Singh A, Verma R, Nascimento M. Evolving men: initial results from the International Men and Gender Equality Survey. Washington, DC: International Centre for Research on Women; 2011.
3. Jewkes R, Sikweyiya Y, Morrell R, Dunkle K. Gender inequitable masculinity and sexual entitlement in rape perpetration South Africa: findings of a cross-sectional study. PLoS ONE. 2011;6(12):e29590.
4. Chirwa ED, Sikweyiya Y, Addo-Lartey AA, Ogum Alangea D, Coker-Appiah D, Adanu RMK, et al. Prevalence and risk factors of physical or sexual intimate violence perpetration amongst men in four districts in the central region of Ghana: baseline findings from a cluster randomised controlled trial. PLoS ONE. 2018;13(3):e0191663.
5. Fulu E, Jewkes R, Roselli T, Garcia-Moreno C, Team UNM-CC-sSoMVR. Prevalence of and factors associated with male perpetration of intimate partner violence: findings from the UN multi-country cross-sectional study on men and violence in Asia and the Pacific. Lancet Glob Health. 2013;1(4):187–207.
6. World Health Organization. Preventing intimate partner and sexual violence against women: taking action and generating evidence. Geneva, Switzerland: World Health Organization; 2010.
7. Li Y, Marshall CM, Rees HC, Nunez A, Ezeanolue E, Ehiri J. Intimate partner violence and HIV infection among women: a systematic review and meta-analysis. J Int AIDS Soc. 2014;17:18845.
8. General Statistics Office of Vietnam. "Keeping silent is dying": results from the national study on domestic violence against women in Vietnam. Hanoi, Vietnam: General Statistics Office of Vietnam; 2010.
9. Yount KM, Higgins EM, Vanderende KE, Krause KH, Minh TH, Schuler SR, et al. Men's perpetration of intimate partner violence in Vietnam: gendered social learning and the challenges of masculinity. Men Masc. 2015;19(1):64–84.
10. Gilchrist G, Radcliffe P, Noto AR, d'Oliveira AF. The prevalence and factors associated with ever perpetrating intimate partner violence by men receiving substance use treatment in Brazil and England: a cross-cultural comparison. Drug Alcohol Rev. 2017;36(1):34–51.
11. Jansen HA, Nguyen TV, Hoang TA. Exploring risk factors associated with intimate partner violence in Vietnam: results from a cross-sectional national survey. Int J Public Health. 2016;61(8):923–34.
12. Afifi TO, Henriksen CA, Asmundson GJ, Sareen J. Victimization and perpetration of intimate partner violence and substance use disorders in a nationally representative sample. J Nerv Ment Dis. 2012;200(8):684–91.
13. Hershow RB, Bhadra M, Mai NVT, Sripaipan T, Ha TV, Go VF. A qualitative study with women living with HIV on perceived gender norms and experiences of intimate partner Violence in Northern Vietnam. J Interpers Violence. 2017. https://doi.org/10.1177/0886260517724834.
14. Easton CJ, Mandel DL, Hunkele KA, Nich C, Rounsaville BJ, Carroll KM. A cognitive behavioral therapy for alcohol-dependent domestic violence offenders: an integrated substance abuse-domestic violence treatment approach (SADV). Am J Addict. 2007;16(1):24–31.
15. Fals-Stewart W, Kashdan TB, O'Farrell TJ, Birchler GR. Behavioral couples therapy for drug-abusing patients: effects on partner violence. J Subst Abuse Treat. 2002;22(2):87–96.
16. Kraanen FL, Vedel E, Scholing A, Emmelkamp PM. The comparative effectiveness of Integrated treatment for substance abuse and partner violence (I-StoP) and substance abuse treatment alone: a randomized controlled trial. BMC Psychiatry. 2013;13:189.
17. Stuart GL, Ramsey SE, Moore TM, Kahler CW, Farrell LE, Recupero PR, et al. Reductions in marital violence following treatment for alcohol dependence. J Interpers Violence. 2003;18(10):1113–31.
18. Satyanarayana VA, Nattala P, Selvam S, Pradeep J, Hebbani S, Hegde S, et al. Integrated cognitive behavioral intervention reduces intimate partner violence among alcohol dependent men, and improves mental health outcomes in their spouses: a clinic based randomized controlled trial from South India. J Subst Abuse Treat. 2016;64:29–34.
19. Gilbert L, El-Bassel N, Wu E, Chang M. Intimate partner violence and HIV risks: a longitudinal study of men on methadone. J Urban Health. 2007;84(5):667–80.
20. Hoang T, Quach TT, Tran TT. 'Because I am a man, I should be gentle to my wife and my children': positive masculinity to stop gender-based violence in a coastal district in Vietnam. Gender Dev. 2013;21(1):81–96.
21. Yount KM, Pham HT, Minh TH, Krause KH, Schuler SR, Anh HT, et al. Violence in childhood, attitudes about partner violence, and partner violence perpetration among men in Vietnam. Ann Epidemiol. 2014;24(5):333–9.
22. Bandura A. Social learning theory. Englewood Cliffs, N.J.: Prentice Hall; 1977.
23. Glanz K, Rimer B, Viswanath K. Health behavior: theory, research, and practice. 5th ed. San Francisco, CA: Jossey-Bass; 2015.
24. Jewkes R. Intimate partner violence: causes and prevention. Lancet. 2002;359(9315):1423–9.
25. Jewkes R, Sikweyiya Y, Morrell R, Dunkle K. The relationship between intimate partner violence, rape and HIV amongst South African men: a cross-sectional study. PLoS ONE. 2011;6(9):e24256.
26. Decker MR, Seage GR, Hemenway D, Gupta J, Raj A, Silverman JG. Intimate partner violence perpetration, standard and gendered STI/HIV risk behaviour, and STI/HIV diagnosis among a clinic-based sample of men. Sex Transm Infect. 2009;85(7):555–60.
27. Raj A, Reed E, Welles SL, Santana MC, Silverman JG. Intimate partner violence perpetration, risky sexual behavior, and STI/HIV diagnosis among heterosexual African American men. Am J Mens Health. 2008;2(3):291–5.
28. Go VF, Srikrishnan AK, Salter ML, Mehta S, Johnson SC, Sivaram S, et al. Factors associated with the perpetration of sexual violence among wine-shop patrons in Chennai. India Soc Sci Med. 2010;71(7):1277–84.
29. Sambisa W, Angeles G, Lance PM, Naved RT, Curtis SL. Physical and sexual abuse of wives in urban Bangladesh: husbands' reports. Stud Fam Plann. 2010;41(3):165–78.

30. Hembling J, Andrinopoulos K. Evidence of increased STI/HIV-related risk behavior among male perpetrators of intimate partner violence in Guatemala: results from a national survey. AIDS Care. 2014;26(11):1411–8.
31. Raj A, Santana MC, La Marche A, Amaro H, Cranston K, Silverman JG. Perpetration of intimate partner violence associated with sexual risk behaviors among young adult men. Am J Public Health. 2006;96(10):1873–8.
32. Connell RW. Masculinities. Berkeley, CA: University of California Press; 1995.
33. Connell RW, Messerschmidt JW. Hegemonic masculinity: rethinking the concept. Gender Soc. 2005;19(6):829–59.
34. Dasgupta A, Silverman J, Saggurti N, Ghule M, Donta B, Battala M, Nair S, Gajanan V, Raj A. Understanding men's elevated alcohol use, gender equity ideologies, and intimate partner violence among married couples in rural India. Am J Men's Health. 2018;12(4):1084–93.
35. Marshall KJ, Fowler DN, Walters ML, Doreson AB. Interventions that address intimate partner violence and HIV among women: a systematic review. AIDS Behav. 2018;22(10):3244–63.
36. Abramsky T, Devries K, Kiss L, Nakuti J, Kyegombe N, Starmann E, et al. Findings from the SASA! Study: a cluster randomized controlled trial to assess the impact of a community mobilization intervention to prevent violence against women and reduce HIV risk in Kampala. Uganda BMC Med. 2014;12:122.
37. Pettifor A, Lippman SA, Gottert A, Suchindran CM, Selin A, Peacock D, et al. Community mobilization to modify harmful gender norms and reduce HIV risk: results from a community cluster randomized trial in South Africa. J Int AIDS Soc. 2018;21(7):e25134.
38. Pronyk PM, Hargreaves JR, Kim JC, Morison LA, Phetla G, Watts C, et al. Effect of a structural intervention for the prevention of intimate-partner violence and HIV in rural South Africa: a cluster randomised trial. Lancet. 2006;368(9551):1973–83.
39. Minnis AM, Doherty IA, Kline TL, Zule WA, Myers B, Carney T, et al. Relationship power, communication, and violence among couples: results of a cluster-randomized HIV prevention study in a South African township. Int J Womens Health. 2015;7:517–25.
40. Wechsberg WM, Zule WA, Luseno WK, Kline TL, Browne FA, Novak SP, et al. Effectiveness of an adapted evidence-based woman-focused intervention for sex workers and non-sex workers: the Women's Health CoOp in South Africa. J Drug Issues. 2011;41(2):233–52.
41. Gibbs A. Tackling gender inequalities and intimate partner violence in the response to HIV: moving towards effective interventions in Southern and Eastern Africa. Afr J AIDS Res. 2016;15(2):141–8.
42. Jewkes R, Flood M, Lang J. From work with men and boys to changes of social norms and reduction of inequities in gender relations: a conceptual shift in prevention of violence against women and girls. Lancet. 2015;385(9977):1580–9.
43. Levintow SN, Pence BW, Ha TV, Minh NL, Sripaipan T, Latkin CA, et al. Prevalence and predictors of depressive symptoms among HIV-positive men who inject drugs in Vietnam. PLoS ONE. 2018;13(1):e0191548.
44. Nanni MG, Caruso R, Mitchell AJ, Meggiolaro E, Grassi L. Depression in HIV infected patients: a review. Curr Psychiatry Rep. 2015;17(1):530.
45. Williams EC, Hahn JA, Saitz R, Bryant K, Lira MC, Samet JH. Alcohol use and human immunodeficiency virus (HIV) infection: current knowledge, implications, and future directions. Alcohol Clin Exp Res. 2016;40(10):2056–72.
46. Chander G, Lau B, Moore RD. Hazardous alcohol use: a risk factor for non-adherence and lack of suppression in HIV infection. J Acquir Immune Defic Syndr. 2006;43(4):411–7.
47. Do HM, Dunne MP, Kato M, Pham CV, Nguyen KV. Factors associated with suboptimal adherence to antiretroviral therapy in Viet Nam: a cross-sectional study using audio computer-assisted self-interview (ACASI). BMC Infect Dis. 2013;13:154.
48. Tran BX, Nguyen LT, Do CD, Nguyen QL, Maher RM. Associations between alcohol use disorders and adherence to antiretroviral treatment and quality of life amongst people living with HIV/AIDS. BMC Public Health. 2014;14:27.
49. Whetten K, Shirey K, Pence BW, Yao J, Thielman N, Whetten R, et al. Trauma history and depression predict incomplete adherence to antiretroviral therapies in a low income country. PLoS ONE. 2013;8(10):e74771.
50. Brickman C, Propert KJ, Voytek C, Metzger D, Gross R. Association between depression and condom use differs by sexual behavior group in patients with HIV. AIDS Behav. 2017;21(6):1676–83.
51. Cunradi CB, Mair C, Todd M. Alcohol outlet density, drinking contexts and intimate partner violence: a review of environmental risk factors. J Drug Educ. 2014;44(1–2):19–33.
52. Machisa MT, Christofides N, Jewkes R. Structural pathways between child abuse, poor mental health outcomes and male-perpetrated intimate partner violence (IPV). PLoS ONE. 2016;11(3):e0150986.
53. Bandura A. Social foundations of thought and action: a social cognitive theory. Englewood Cliffs, NJ: Prentice-Hall; 1986.
54. Coker AL. Does physical intimate partner violence affect sexual health? A systematic review. Trauma Violence Abuse. 2007;8(2):149–77.
55. Coker AL, Smith PH, Bethea L, King MR, McKeown RE. Physical health consequences of physical and psychological intimate partner violence. Arch Fam Med. 2000;9(5):451–7.
56. Lagdon S, Armour C, Stringer M. Adult experience of mental health outcomes as a result of intimate partner violence victimisation: a systematic review. Eur J Psychotraumatol. 2014. https://doi.org/10.3402/ejpt.v5.24794.
57. Brown SL, Bulanda JR. Relationship violence in young adulthood: a comparison of daters, cohabitors, and marrieds. Soc Sci Res. 2008;37(1):73–877.
58. Sutton D, Dawson M. Differentiating characteristics of intimate partner violence: do relationship status, state, and duration matter? J Interpers Violence. 2018. https://doi.org/10.1177/0886260518795501.
59. Hutton HE, Lancaster KE, Zuskov D, Mai NVT, Quynh BX, Chander G, Latkin CA, Vu PT, Sripaipan T, Ha TV, Go VF. Cultural adaptation of two evidence-based alcohol interventions for antiretroviral treatment clinic paitents in Vietnam. J Int Assoc Provid AIDS Care. 2019. https://doi.org/10.1177/2325958219854368.
60. Straus MA, Douglas EM. A short form of the Revised Conflict Tactics Scales, and typologies for severity and mutuality. Violence Vict. 2004;19(5):507–20.
61. Nguyen TD. Prevalence of male intimate partner abuse in Vietnam. Violence Against Women. 2006;12(8):732–9.
62. Murshid NS, Murshid N. Intergenerational transmission of marital violence: results from a nationally representative sample of men. J Interpers Violence. 2018;33(2):211–27.
63. Garcia-Moreno C, Guedes A, Knerr W. Understanding and addressing violence against women. Geneva: World Health Organization; 2012.
64. Babor TF, Higgins-Biddle JC, Saunders JB, Monteiro MG. The alcohol use disorders identification test guidelines for use in primary care. Geneva: World Health Organization; 2001.

65. Giang KB, Allebeck P, Spak F, Van Minh H, Dzung TV. Alcohol use and alcohol consumption-related problems in rural Vietnam: an epidemiological survey using AUDIT. Subst Use Misuse. 2008;43(3–4):481–95.
66. Kroenke K, Spitzer RL, Williams JB. The PHQ-9: validity of a brief depression severity measure. J Gen Intern Med. 2001;16(9):606–13.
67. Pence BW, Gaynes BN, Atashili J, O'Donnell JK, Tayong G, Kats D, et al. Validity of an interviewer-administered patient health questionnaire-9 to screen for depression in HIV-infected patients in Cameroon. J Affect Disord. 2012;143(1–3):208–13.
68. Gelaye B, Williams MA, Lemma S, Deyessa N, Bahretibeb Y, Shibre T, et al. Validity of the patient health questionnaire-9 for depression screening and diagnosis in East Africa. Psychiatry Res. 2013;210(2):653–61.
69. Tran BX, Dang AK, Truong NT, Ha GH, Nguyen HLT, Do HN, et al. Depression and quality of life among patients living with HIV/AIDS in the era of universal treatment access in Vietnam. Int J Environ Res Public Health. 2018. https://doi.org/10.3390/ijerph15122888.
70. Spitzer RL, Kroenke K, Williams JB, Lowe B. A brief measure for assessing generalized anxiety disorder: the GAD-7. Arch Intern Med. 2006;166(10):1092–7.
71. Collier KM, Weiss B, Pollack A, Lam T. Explanatory variables for women's increased risk for mental health problems in Vietnam. Soc Psychiatry Psychiatr Epidemiol. 2019;55:359–69.
72. Beard C, Bjorgvinsson T. Beyond generalized anxiety disorder: psychometric properties of the GAD-7 in a heterogeneous psychiatric sample. J Anxiety Disord. 2014;28(6):547–52.
73. Pulerwitz J, Barker G. Measuring attitudes toward gender norms among young men in Brazil: development and psychometric evaluation of the GEM scale. Men and Masc. 2008;10(3):322–38.
74. Geeta N. Compendium of gender scales. Washington, DC: FHI 360/C-Change; 2011.
75. Straus MA, Hamby SL, Boney-McCoy S, Sugarman D. Manual for the personal and relationships profile (PRP). Durham, NH: University of New Hampshire, Family Research Laboratory; 2010.
76. Dahlberg LL, Toal SB, Behrens CB. Measuring violence-related attitudes, beliefs, and behaviors among youths: a compendium of assessment tools. Atlanta, GA: Division of Violence Prevention, National Center for Injury Prevention and Control, Centers for Disease Control and Prevention; 1998.
77. Beyer K, Wallis AB, Hamberger LK. Neighborhood environment and intimate partner violence: a systematic review. Trauma Violence Abuse. 2015;16(1):16–47.
78. Reed E, Silverman JG, Welles SL, Santana MC, Missmer SA, Raj A. Associations between perceptions and involvement in neighborhood violence and intimate partner violence perpetration among urban. Afr Am Men J Community Health. 2009;34(4):328–35.
79. Zou G. A modified poisson regression approach to prospective studies with binary data. Am J Epidemiol. 2004;159(7):702–6.
80. Carlos S, Lopez-Del Burgo C, Burgueno E, Martinez-Gonzalez MA, Osorio A, Ndarabu A, et al. Male condom use, multiple sexual partners and HIV: a prospective case-control study in Kinshasa (DRC). AIDS Care. 2017;29(6):772–81.
81. Hendershot CS, Stoner SA, Pantalone DW, Simoni JM. Alcohol use and antiretroviral adherence: review and meta-analysis. J Acquir Immune Defic Syndr. 2009;52(2):180–202.
82. Kowalski S, Colantuoni E, Lau B, Keruly J, McCaul ME, Hutton HE, et al. Alcohol consumption and CD4 T-cell count response among persons initiating antiretroviral therapy. J Acquir Immune Defic Syndr. 2012;61(4):455–61.
83. Pence BW. The impact of mental health and traumatic life experiences on antiretroviral treatment outcomes for people living with HIV/AIDS. J Antimicrob Chemother. 2009;63(4):636–40.
84. Foran HM, O'Leary KD. Alcohol and intimate partner violence: a meta-analytic review. Clin Psychol Rev. 2008;28(7):1222–344.
85. Crane CA, Godleski SA, Przybyla SM, Schlauch RC, Testa M. The proximal effects of acute alcohol consumption on male-to-female aggression: a meta-analytic review of the experimental literature. Trauma Violence Abuse. 2016;17(5):520–31.
86. Davis KC, Neilson EC, Wegner R, Danube CL. The intersection of men's sexual violence perpetration and sexual risk behavior: a literature review. Aggress Violent Behav. 2018;40:83–90.
87. O'Farrell TJ, Fals-Stewart W, Murphy M, Murphy CM. Partner violence before and after individually based alcoholism treatment for male alcoholic patients. J Consult Clin Psychol. 2003;71(1):92–102.
88. Stuart GL, O'Farrell TJ, Temple JR. Review of the association between treatment for substance misuse and reductions in intimate partner violence. Subst Use Misuse. 2009;44(9–10):1298–317.
89. O'Farrell TJ, Murphy CM, Stephan SH, Fals-Stewart W, Murphy M. Partner violence before and after couples-based alcoholism treatment for male alcoholic patients: the role of treatment involvement and abstinence. J Consult Clin Psychol. 2004;72(2):202–17.
90. Fischer JL, Fitzpatrick J, Cleveland B, Lee JM, McKnight A, Miller B. Binge drinking in the context of romantic relationships. Addict Behav. 2005;30(8):1496–516.
91. Quigley BM, Leonard KE. Alcohol and the continuation of early marital aggression. Alcohol Clin Exp Res. 2000;24(7):1003–100.
92. White HR, Chen PH. Problem drinking and intimate partner violence. J Stud Alcohol. 2002;63(2):205–14.
93. Reyes HL, Foshee VA, Bauer DJ, Ennett ST. Developmental associations between adolescent alcohol use and dating aggression. J Res Adolesc. 2012;22(3):526–41.
94. Madruga CS, Viana MC, Abdalla RR, Caetano R, Laranjeira R. Pathways from witnessing parental violence during childhood to involvement in intimate partner violence in adult life: the roles of depression and substance use. Drug Alcohol Rev. 2017;36(1):107–14.
95. Vung ND, Krantz G. Childhood experiences of interparental violence as a risk factor for intimate partner violence: a population-based study from northern Vietnam. J Epidemiol Community Health. 2009;63(9):708–14.
96. Kimber M, Adham S, Gill S, McTavish J, MacMillan HL. The association between child exposure to intimate partner violence (IPV) and perpetration of IPV in adulthood—a systematic review. Child Abuse Negl. 2018;76:273–86.
97. Hearn J. The violences of men. London, UK: Sage; 1998.
98. Horton P, Rydstrom H. Heterosexual masculinity in contemporary Vietnam: privileges, pleasures, and protests. Men Masc. 2011;14(5):542–64.
99. Rydstrom H. Encountering, "hot" anger: domestic violence in contemporary Vietnam. Violence Against Women. 2003;9(6):676–97.
100. Schuler SR, Hoang TA, Vu SH, Tan HM, Bui TT, Pham VT. Constructions of gender in Vietnam: in pursuit of the 'three criteria'. Cult Health Sex. 2006;8(5):383–94.
101. Hong K, Anh N, Ogden J. Understanding HIV and AIDS-related stigma and discrimination in Vietnam. Hanoi: Institute for Social Development Studies and International Center for Research on Women; 2004.
102. Birkley E, Eckhardt CI. Anger, hostility, internalizing negative emotions, and intimate partner violence perpetration: a meta-analytic review. Clin Psychol Rev. 2015;37:40–56.

103. Hesser H, Axelsson S, Backe V, Engstrand J, Gustafsson T, Holmgren E, et al. Preventing intimate partner violence via the Internet: a randomized controlled trial of emotion-regulation and conflict-management training for individuals with aggression problems. Clin Psychol Psychother. 2017;24(5):1163–77.
104. Tol WA, Murray SM, Lund C, Bolton P, Murray LK, Davies T, et al. Can mental health treatments help prevent or reduce intimate partner violence in low- and middle-income countries? A systematic review. BMC Womens Health. 2019;19(1):34.
105. Zhao M, Liu B, Zheng T, Xu J, Hao Y, Wang J, et al. Factors associated with hostility among people living with HIV/AIDS in Northeast China: a cross-sectional study. BMC Public Health. 2019;19(1):1189.
106. Skowron EA, Reinemann DHS. Psychological interventions for child maltreatment: a meta-analysis. Psychotherapy. 2005;42:52–71.
107. Chan BT, Pradeep A, Prasad L, Murugesan V, Chandrasekaran E, Kumarasamy N, et al. Prevalence and correlates of psychosocial conditions among people living with HIV in southern India. AIDS Care. 2017;29(6):746–50.
108. Lai HM, Cleary M, Sitharthan T, Hunt GE. Prevalence of comorbid substance use, anxiety and mood disorders in epidemiological surveys, 1990–2014: a systematic review and meta-analysis. Drug Alcohol Depend. 2015;154:1–13.
109. Quigley BM, Houston RJ, Antonius D, Testa M, Leonard KE. Alcohol use moderates the relationship between symptoms of mental illness and aggression. Psychol Addict Behav. 2018;32(7):770–8.
110. Maiuro RD. Anger, hostility, and depression in domestically violent versus generally assaultive men and nonviolent control subjects. J Consult Clin Psychol. 1988;56(1):17–23.
111. Galambos NL, Johnson MD, Krahn HJ. The anger-depression connection: between-persons and within-person associations from late adolescence to midlife. Dev Psychol. 2018;54(10):1940–53.
112. Singer M. A dose of drugs, a touch of violence, a case of AIDS: conceptualizing the SAVA syndemic. Free Inquiry Creative Sociol. 1996;24(2):99–110.
113. Singer MC, Erickson PI, Badiane L, Diaz R, Ortiz D, Abraham T, et al. Syndemics, sex and the city: understanding sexually transmitted diseases in social and cultural context. Soc Sci Med. 2006;63(8):2010–21.
114. Chander G, Hutton HE, Lau B, Xu X, McCaul ME. Brief intervention decreases drinking frequency in HIV-infected, heavy drinking women: results of a randomized controlled trial. J Acquir Immune Defic Syndr. 2015;70(2):137–45.
115. Easton CJ, Crane CA, Mandel D. A randomized controlled trial assessing the efficacy of cognitive behavioral therapy for substance-dependent domestic violence offenders: an integrated substance abuse-domestic violence treatment approach (SADV). J Marital Fam Ther. 2018;44(3):483–98.
116. Gaynes BN, Pence BW, Atashili J, O'Donnell JK, Njamnshi AK, Tabenyang ME, et al. Changes in HIV outcomes following depression care in a resource-limited setting: results from a pilot study in Bamenda, Cameroon. PLoS ONE. 2015;10(10):e0140001.
117. Magill M, Ray LA. Cognitive-behavioral treatment with adult alcohol and illicit drug users: a meta-analysis of randomized controlled trials. J Stud Alcohol Drugs. 2009;70(4):516–27.