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Tobacco, Alcohol, Drug Use, and Intimate Partner Violence Among MSM Living With HIV.

Permalink

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Journal

Journal of the Association of Nurses in AIDS Care, 30(6)

ISSN

1055-3290

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Publication Date

2019-11-01

DOI

10.1097/jnc.0000000000000090

Peer reviewed

Tobacco, Alcohol, Drug Use, and Intimate Partner Violence Among MSM Living With HIV

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Abstract

Men who have sex with men (MSM) and are living with HIV have reported high rates of intimate partner violence (IPV) and substance use. We examined relationships between accumulative IPV, incidents of IPV, and numbers of substances used. One hundred twenty Taiwanese MSM living with HIV completed a cross-sectional survey. Accumulative IPV was assessed by summing the number of 15 types of IPV experienced in the previous year; substance use was measured by any use of alcohol, tobacco, or other drugs during the previous week. In multivariate analysis, IPV was not associated with tobacco use but was positively associated with alcohol and other drug use and significantly associated with the probability of using multiple substances. MSM living with HIV who experienced greater IPV were more likely to use alcohol and other drugs and were more likely to use more than one substance. Health care providers screening for IPV should also screen for substance use.

Key words: alcohol, drug use, intimate partner violence, MSM, tobacco, Taiwan

Men who have sex with men (MSM) are at higher risk for using certain substances, including alcohol (85–90%; Roxburgh, Lea, de Wit, & Degenhardt, 2016), tobacco (21–50%; Gerend, Newcomb, & Mustanski, 2017), and other drugs such as stimulants (35–59%; Okafor et al., 2017), and at higher risk of concurrent use of two or more substances (37–40%; Kecojevic, Jun, Reisner, & Corliss, 2017). A similar trend has been found in Asian-developed and developing countries (Yi, Peltzer, Pengpid, & Susilowati, 2017), where high-risk Asians (e.g., MSM, sex workers) are also at greater risk of using more than one type of substance. Studies have estimated that 73–83% of Vietnamese MSM sex workers use alcohol (Yu, Clatts, Goldsamt, & Giang le, 2015), 66–72% of Vietnamese MSM sex workers use tobacco (Yu et al., 2015), and 25–77% of Chinese MSM use other drugs

(Zhao et al., 2017). In addition, 57% of Chinese MSM were found to use two or more substances concurrently (Berg et al., 2011).

At the same time, substance use may contribute to worsening health conditions experienced by MSM. For instance, tobacco use increases the risk of anxiety (Moylan, Jacka, Pasco, & Berk, 2013) and immune dysregulation (Nakata, Swanson, & Caruso, 2010). In addition, use of alcohol and other drugs is often associated with heightened risk of engaging in condomless sex, which increases the rate of HIV infection among MSM in Western and Asian countries (Daskalopoulou et al., 2017). In particular, recreational substance use, such as prescription medication and mixed substances, has escalated to health emergency status in several countries (Rooney, Tulloch, & Blashill, 2018).

Substance use is of particular concern for MSM who are already infected and living with HIV. It is estimated that 39% of MSM living with HIV use alcohol excessively (Kahler et al., 2015), 36% use tobacco (Ompad et al., 2014), 51% use other drugs (Daskalopoulou et al., 2014), and 24% use two or more substances concurrently (Daskalopoulou et al., 2014). However, substance use has also been associated with risk behaviors and poor health outcomes in people living with HIV (PLWH), including MSM living with HIV. Research has documented that substance use, particularly alcohol, tobacco, and narcotics, can interfere with patient health behaviors (Kuchinad et al., 2016), resulting in a 25–35% increase in mortality rates and reduced life expectancy of up to 16 years (Petoumenos & Law, 2016).

Sponsorships or competing interests that may be relevant to content are disclosed at the end of this article.

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<http://dx.doi.org/10.1097/JNC.000000000000090>

To understand the factors that place MSM, both with and without HIV infection, at greater risk for substance use, we can turn to an emerging body of literature, documenting an array of psychosocial factors that may play a role. These factors include age, education attainment (Ibragimov et al., 2017), mental distress (Tsuyuki et al., 2017), sexual discrimination and victimization (Branstrom & Pachankis, 2018), homonegativity (Nakamura & Zea, 2010), stigma (Zhang et al., 2016), and sensation seeking (Dolezal, Carballo-Diequez, Nieves-Rosa, & Diaz, 2000) among others. Notably, over the past decade, a growing number of studies have documented the link between intimate partner violence (IPV) and substance use among MSM.

Intimate partner violence, broadly defined, refers to acts carried out with intention of, or perceived intention of, causing physical, emotional, and psychological pain in the context of intimate or romantic relationships (Hattery, 2009). Although historically, heterosexual women have been considered the main victims of IPV, empirical studies over the past 2 decades have begun to recognize that MSM are also subject to high levels of IPV (Ibragimov et al., 2017). Studies have estimated that 12–39% of MSM had experienced some form of IPV (Ibragimov et al., 2017; Tran et al., 2014; Wu et al., 2015). Similarly, it has been estimated that 29–35% of MSM living with HIV have experienced IPV (Raissi, Krentz, Siemieniuk, & Gill, 2015). In addition, according to one meta-analysis, experiences of IPV were associated with increased risk of substance use (Buller, Devries, Howard, & Bacchus, 2014). Of MSM who reported experiences of IPV, the odds of using tobacco (Yu et al., 2013), alcohol (Bacchus et al., 2017), and stimulant/recreational drugs (Duncan et al., 2018) significantly increased. One hypothesis explaining the heightened risk of substance use among MSM who experienced IPV is that substance use may have emerged as a coping method to manage the mental health sequelae of IPV; at the same time, substance use may have triggered certain affective or behavioral changes that placed some MSM at greater risk for IPV (Davis, Kaighobadi, Stephenson, Rael, & Sandfort, 2016). It has been found that survivors of IPV often report higher rates of mental distress and mood and anxiety disorders (Tsuyuki et al., 2017). In MSM living with HIV, those who have experienced IPV were shown to be more likely to report greater depressive and anxiety symptoms compared with those who had not experienced IPV (Pantalone, Rood, Morris, & Simoni, 2014).

However, because research regarding substance use and IPV among MSM living with HIV is still in its infancy, there are gaps in our understanding about how

experiences of IPV are associated with different types of substance use and multiple substance use. Even fewer studies have documented relationships between substance use and IPV among MSM living with HIV in Asian countries. This paucity of empirical evidence has impeded the progress of intervention development that takes into account comorbid trauma and substance use in Asian MSM. To provide further evidence and to understand nuances in the relationships between IPV and substance use in a Taiwanese sample of MSM living with HIV, we evaluated the associations between IPV and (a) different types of substance use (i.e., alcohol, tobacco, and other drugs) and (b) use of multiple substances.

Methods

Sample, Settings, and Procedures

Men who have sex with men living with HIV ($N = 120$) were recruited from the Taipei Union Hospital System Kunming Branch (TUH), a leading hospital designated to treat infectious diseases, from October 2011 through March 2012, 4 years after the Domestic Violence Prevention Act officially extended protections to same-sex couples in Taiwan (Sanders, 2014). Inclusion criteria for our study were (a) at least 18 years of age, (b) confirmed HIV seropositive, (c) self-disclosed as MSM, (d) receiving care at TUH, and (e) willing to share personal experiences. TUH clinicians informed patients from outpatient clinics during routine clinical visits about the study and referred them to nonclinical research personnel who explained the study, answered questions, and obtained signed written consent. Participants who met the inclusion criteria completed the 45-minute to 60-minute surveys using an Audio Computer-Assisted Self-Interview (ACASI) system in a private room at TUH. The computer guided patients to move through questions using a simple point-and-click system. Use of ACASI lessens the likelihood of socially desirable answers and minimizes data entry errors. Similar ACASI survey programs have proven to be successful in studies of participants with little or no previous computer experience in Chinese-speaking populations (Estes et al., 2010). All study procedures were reviewed and approved by the ethics review boards of the institutions involved (TUH and Yale University).

Measures

We chose several variables for statistical modeling, including IPV experiences, frequency and type of substance use, demographics, clinical factors (year of HIV diagnosis, viral load, and physical quality of life [QOL]),

and psychosocial factors (HIV knowledge, social support, numbers of people disclosed to, and anxiety level). Because we focused on the relationships between IPV and substance use, all the other variables were selected and treated as control factors in the model.

Outcome Variables

Substance use. Substance use was measured by the 10-item Substance Use Assessment, modified by Lightfoot et al. (2005), from a substance use scale that assessed lifetime and recent (within 3 months) use of licit and illicit substances, including alcohol, tobacco, powdered cocaine, crack cocaine, heroin, inhalants, marijuana, opiates, methamphetamine/speed, and others. The scale has been tested in Chinese populations with a reliability of 0.83 (Li et al., 2016). Participants were asked how often they had used each drug in the previous week, on a 9-point scale (0 = *never*; 8 = *more than once a day*). For data analysis, we divided the drugs into three categories of alcohol, tobacco, and other drugs (including marijuana, opiates, heroin, inhalants, and methamphetamine). We created a variable of other drugs because many of the study participants could not identify the specific drugs they were using; in addition, many participants were polydrug users. An approach that sums up different drugs may capture the common vulnerability of substance use across drugs (Tsuang et al., 1998). We then dichotomized the three substance use variables into 0 = *No use last week* and 1 = *Any use last week*. Finally, we summed the three binary substance use variables to create a summary variable, multisubstance use, describing how many types of substances our participants used in the previous week, ranging from 0 to 3.

Key independent variable. Intimate partner violence was measured by the 15-item Danger Assessment Scale, which assessed several IPV-related factors such as types of violence, frequency of IPV, and presence of threatening objects (Campbell, Webster, & Glass, 2009). Types of violence included but were not limited to physical violence, choking, being forced to have sex, threats to kill, and controlling activities (e.g., your partner controlling who you can be friends with or when you can see your family). Each endorsed item was assigned one point, with higher scores indicating more types of IPV experiences, ranging from 0 to 15. The test-retest reliability of this scale was .94, and the internal consistency was .86 (Lin, 2006). A Chinese version of the scale has been validated (Lin, 2006).

Control variables. We selected an array of control variables to more accurately estimate the relationships between IPV and substance use. The control variables

included demographic characteristics, clinical factors, and psychosocial factors.

Demographic characteristics, including participant ages, ethnicity (*Islanders, Mainlanders, other*), education level (\leq *high school, some college, college degree and above*), and socioeconomic status (0 = *lowest*, 3 = *highest*), were collected through self-report. In Taiwan, the term Islanders is usually reserved for people who lived on the island before 1949. Those who arrived after the Communist occupation from Mainland China are referred to as Mainlanders (Hays, 2015).

Clinical factors selected for control included years with diagnosis (ranging from 0 to 21), viral load (*detectable vs. nondetectable*), and physical QOL (measured by the physical QOL subscale from the Medical Outcomes Study HIV Health Survey, ranging from 0 [*low*] to 3 [*high*], Cronbach alpha = 0.88).

Psychosocial factors selected for control included HIV knowledge (measured by the 10-item HIV Knowledge Assessment, ranging from 0 [*minimal*] to 10 [*optimal*], Cronbach alpha = 0.81; Wang, Jiang, Siegal, Falck, & Carlson, 2001), social support (how many types of assistance participants received), number of people to whom participants disclosed their HIV serostatus, and levels of anxiety (measured by the 10-item instrument derived from the Symptom Checklist-90-R; ranging from 0 [*low*] to 4 [*high*], Cronbach alpha = 0.96; Rezaei, Taramian, & Kafie, 2013).

Data Analysis

First, univariate statistics were computed to obtain overall characteristics of our sample of 120 MSM living with HIV and the distributions of key selected factors, in particular, experiences of IPV, any use of three types of substances, and multisubstance use. Second, to estimate the relationships between substance use and experiences of IPV while controlling for potential confounding factors, logistic models and ordered logit models were used for binary and ordinal outcomes, respectively. Before multivariate models were built, the locally weighted scatterplot smoothing technique (Cleveland, 1981) was applied to verify whether the relationships between IPV and use of three different substances followed reasonable shapes required by logistic regression and whether transformation of IPV was necessary. A series of model tests were conducted to ensure the model assumptions were not violated by current model specifications, including the link test and goodness-of-fit test for logistic models (Simonoff, 2014), and the Brant test for ordered logit models (Brant, 1990). To simultaneously estimate the three binary outcomes, generalized structural

equation models were used (Skrondal & Rabe-Hesketh, 2004). Marginal probabilities of outcomes regarding IPV were calculated for data visualization. Finally, the Huber–White robust estimator was used for statistical inference. All statistical procedures were conducted in Stata15, a commercial statistical package.

Results

In our sample of 120 MSM living with HIV, the average age was 36.85 years ($SD = 8.83$), with 71% identified as Islanders and 21% Mainlanders. More than one third (37%) of all participants had a high school diploma, and the average socioeconomic index score was 2.17 ($SD = 0.98$). Regarding clinical characteristics, our sample of MSM had lived with well-controlled HIV (74% with an undetectable viral load) on average for almost 8 years ($SD = 5.57$). However, they presented with low-to-moderate physical QOL ($M = 1.68$, $SD = 0.55$). Finally, this group of men also displayed high levels of HIV-related knowledge ($M = 2.56$, $SD = 0.38$) and lower levels of anxiety ($M = 1.88$, $SD = 0.93$). Detailed information is summarized in Table 1.

Table 2 summarizes the results of model fitting for both binary and ordinal outcomes. Please note that because we selected the control variables to further adjust the relationships between IPV and substance use, we refrained from interpreting their associations with the outcome (Westreich & Greenland, 2013). The left panel of Table 2 presents estimates from logistic models for any use of the three types of substance in the previous week. All the logistic models passed the link tests and goodness-of-fit tests, suggesting that model specifications and link functions were adequate and fit the data well. The locally weighted scatterplot smoothing curve also suggested that an additional variable, the square of IPV, may be needed to closely model the relationship between IPV and alcohol use. As seen in Table 2, experiences of IPV were significantly associated with alcohol use and other drug use but not with tobacco use in this group of MSM living with HIV. More specifically, when the linear term of IPV increased by 1 unit, the odds of any alcohol use increased by 100% ($p < .05$). However, because the odds of any alcohol use also decreased by 4% ($p < .10$) when the squared term of IPV increased by 1 unit, the rate of increase in alcohol use slowed down when IPV became larger. Similarly, when IPV increased by 1 unit, the odds of other drug use increased by 25% ($p < .05$). Figure 1 demonstrates the model-adjusted marginal probabilities of the three types of substance use across levels of IPV in this group of MSM living with HIV. Note that participants disclosing IPV more than

Table 1. Characteristics of Sample of MSM Living With HIV and Univariate Distributions of Selected Variables

N	120
No. of IPV (<i>M, SD</i>)	0.97 (2.65)
Substance use (<i>n, %</i>)	
Any alcohol	33 (28.21)
Any tobacco	58 (49.57)
Any other drug	20 (16.81)
Multiple substance use (<i>n, %</i>)	
No substance use	40 (33.61)
One Substance use	51 (42.86)
Two or more substance use	28 (23.53)
Demographic factors	
Age (<i>M, SD</i>)	36.85 (8.83)
Ethnicity (<i>n, %</i>)	
Islanders	85 (71.43)
Mainlanders	25 (21.01)
All others	9 (7.56)
Education (<i>n, %</i>)	
≤HS	44 (36.97)
Some college	19 (15.97)
≥College	56 (47.06)
Socioeconomic status (<i>M, SD</i>)	2.17 (0.98)
Clinical factors	
Years with HIV (<i>M, SD</i>)	7.95 (5.57)
Viral Load (<i>n, %</i>)	
Nondetectable	86 (74.14)
Physical quality of life (<i>M, SD</i>)	1.68 (0.55)
Psychosocial factors	
HIV knowledge (<i>M, SD</i>)	2.56 (.38)
Anxiety (<i>M, SD</i>)	1.88 (0.93)
No. of people disclosure (<i>M, SD</i>)	9.27 (15.57)
Social support (<i>M, SD</i>)	6.31 (2.26)

Note. HS = high school; IPV = intimate partner violence; MSM = men who have sex with men.

10 times were few, so Figure 1 was truncated at 10 IPV experiences. As illustrated, this group of men already had a high probability of using tobacco despite low or no

Table 2. Multivariable Models With Three Substance Uses as the Outcome Among MSM Living With HIV

	Binary Outcome						Ordinal Outcome	
	Any Alcohol Use		Any Tobacco Use		Any Other Drug Use		One Level Up	
	AOR	SE	AOR	SE	AOR	SE	AOR	SE
Key independent variable								
No. of IPV	2.00 ^a	0.60	1.06	0.09	1.25 ^a	0.13	1.16 ^a	0.08
No. of IPV2 ^b	0.96 ^c	0.02	—	—	—	—	—	—
Control variables								
Demographic factors ^d								
Age	1.01	0.03	1.03	0.03	1.02	0.04	1.03	0.03
Education								
Some college (vs. ≤ HS)	5.05 ^c	4.48	2.88	2.05	1.84	1.74	3.69 ^a	2.24
≥College (vs. ≤ HS)	6.55 ^a	4.78	0.80	0.44	1.1	0.86	1.91	0.99
Socioeconomic status	0.8	0.25	1.03	0.29	1.23	0.48	0.94	0.21
Clinical factors								
Years with diagnosis	0.98	0.04	1.01	0.05	0.91	0.07	0.97	0.04
Viral load								
Nondetectable (vs. detected)	0.54	0.36	0.35 ^a	0.18	1.08	0.68	0.53	0.29
Physical quality of life	0.47	0.33	0.39 ^c	0.21	0.19 ^a	0.15	0.34 ^a	0.15
Psychosocial factors ^e								
Anxiety	0.95	0.28	1.21	0.29	1.98 ^a	0.69	1.21	0.27
Social support	1.04	0.12	0.76 ^f	0.08	1.17	0.19	0.89	0.08
Constant	6.26	14.74	10.35	25.15	0.02	0.06	8.93	2.32

Note. AOR = adjusted odds ratio; HS = high school; IPV = intimate partner violence; MSM = men who have sex with men; SE = standard error.

^a <0.05.

^b The IPV2 was the squared term of the IPV. Together with IPV, the IPV2 could capture the nonlinear portion of the relationship between IPV and alcohol use.

^c <0.10.

^d Further controlling for ethnicity.

^e Further controlling for HIV knowledge and the number of people disclosure.

^f <0.01.

IPV. By contrast, the use of alcohol increased rapidly with IPV experiences, increasing from 0 to 4 but leveling off later, whereas the use of other drugs increased steadily across the numbers of IPV.

The right panel of Table 2 presents estimates from the ordered logit model for multitype substance use over the previous week. The ordered logit model also passed the Brant test, suggesting that the model specification did not violate parallel assumptions inherent in the ordered logit model. As shown in Table 2, IPV was significantly associated with more types of substance use. More specifically,

a unit increase in IPV was associated with an increase in the odds of one level up (0–1, and 1–2+) in types of substance use by 16% ($p < .05$). Figure 2 demonstrates the model-adjusted marginal probabilities of multitype substance use across levels of IPV experiences. As illustrated, our participants presented with high probability of using at least one type of substance, and the probability for using just one type of substance remained stable across all levels of IPV. However, the probabilities of no substance use decreased rapidly, whereas multitype substance use increased sharply when the levels of IPV went up.

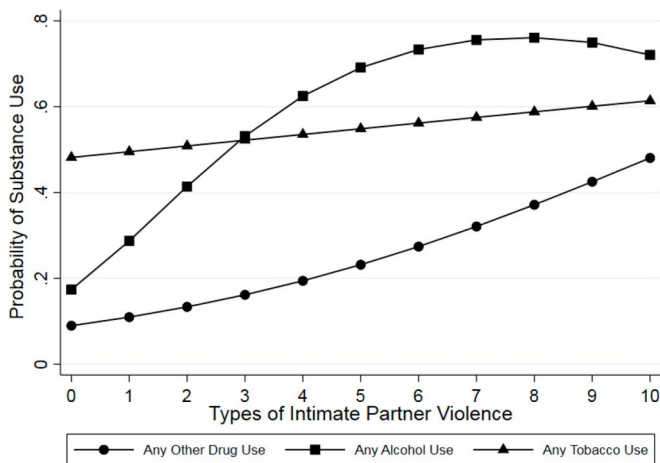


Figure 1. Adjusted probabilities of three substance uses among MSM living with HIV across the numbers of types of intimate partner violence. MSM = men who have sex with men.

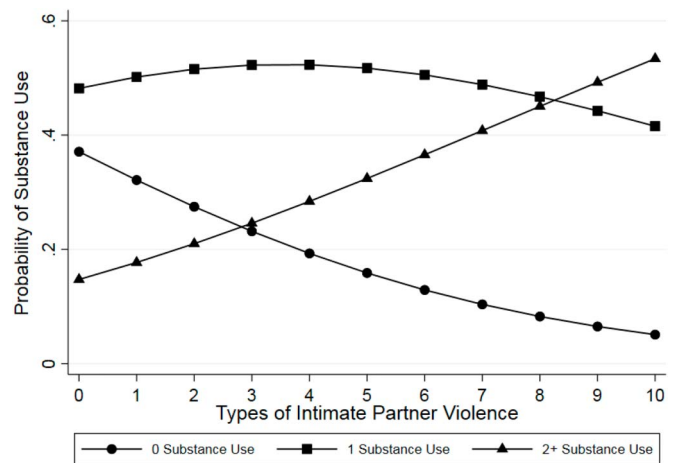


Figure 2. Adjusted probabilities of multitype substance uses among MSM living with HIV across the numbers of types of intimate partner violence. MSM = men who have sex with men.

The results showed that IPV was not associated with tobacco use and was positively associated with alcohol and other drug use. However, the shapes of these relationships differed between alcohol and other drug use, with the probability of alcohol use increasing rapidly from 0 to 4 IPV experiences and slowing thereafter, whereas the probability of other drug use increased steadily across IPV experiences. Finally, IPV was also significantly associated with greater probability of multitype substance use.

Discussion

We aimed to investigate the relationships between IPV and current substance use in a sample of MSM living with HIV. Substances evaluated included alcohol, tobacco, and other drugs. We not only estimated this relationship for each type of substance but also tested the relationship between IPV and multitype substance use.

In our study, we found a relationship between IPV and alcohol use, but the relationship did not appear to be linear. Instead, the likelihood of using alcohol increased rapidly as IPV increased from 0 to 4. However, after four IPV experiences, the increase in likelihood of using alcohol slowed down and reached its peak around 80%. This result was similar to findings from studies showing that MSM who experienced IPV were more likely to report increased alcohol use (Stults, Javdani, Greenbaum, Kapadia, & Halkitis, 2015). The reason that the relationship between IPV and alcohol use was nonlinear in our sample, however, may have been because of a few different factors. The ease of access to alcohol may have made alcohol a popular choice for coping with IPV. This was reflected in the initial rapid increase of alcohol use

when MSM living with HIV experienced one to four IPV. Yet, because the probability of alcohol use was already about 65% when MSM living with HIV experienced four IPV, the ceiling effect may have started to take place to slow the increase. After four IPV experiences, the return of effects of alcohol use may have also diminished, and, hence, the relationship between IPV and alcohol consumption further flattened.

We did not find a relationship between IPV and tobacco use, and this was inconsistent with the literature. Indeed, our findings were not in line with the emerging consensus that exposure to traumatic events was associated with heightened risk of tobacco use (Feldner, Babson, & Zvolensky, 2007). The lack of association between tobacco use and traumatic events might have been because of the fact that the rate of smoking in our sample was already high, even for participants without IPV. Given that gay and bisexual men already have high rates of tobacco use, our participants' use of tobacco might not have been sensitive to the variations of IPV. However, because the prevalence of tobacco use was alarmingly high regardless of IPV, there is an urgent need for action to help MSM living with HIV curb smoking behaviors.

Furthermore, we found that the experience of HIV was associated with increased probability of using other drugs. This finding was consistent with another study of MSM living with HIV, which showed that having a physically abusive sexual partner was associated with greater drug use (Ghanem et al., 2011). In fact, it has been documented that MSM who experience IPV, regardless of HIV serostatus, were at higher risk of using drugs (Bacchus et al., 2017). Our study provided evidence that Taiwanese MSM living with HIV also demonstrated a relationship between experience of IPV and use of other drugs.

Finally, we found that our participants' experiences of IPV were associated with increased concurrent use of different substances, a finding that echoed emerging evidence, demonstrating the relationships between violence exposure, especially IPV, and multiple substance use across different populations. In an Asian MSM sample, it was found that, regardless of HIV serostatus, those who concurrently used different substances were more likely to report experiences of IPV (Wilkerson et al., 2018). Studies have shown that polysubstance users used substances to facilitate sexual self-confidence or self-esteem and to cope with mental distress (Sewell et al., 2017). Based on the significant associations found in our study as well, it is likely that experiences of IPV may be a contributing motivation for using multiple substances for MSM living with HIV. Therefore, it is important to assess the history of IPV exposure and its relationship to mental health and substance use in all PLWH because these factors may affect HIV self-management and engagement in care (Tso et al., 2016).

Limitations

There were several limitations in our study. First, it was a cross-sectional study; therefore, any associations between variables should not be taken to imply causality. Future longitudinal studies should be conducted to causally test these relationships. Second, we recruited study participants from the capital city of Taiwan, which might have affected generalizability to other urban or suburban areas in Asia. Third, our other drug use category was likely heterogeneous because many of the study participants could not clearly define a specific type or quantity of other drug use, and most participants reported polysubstance use. Studies may benefit from toxicity screens to specify which drugs were used by participants. Finally, similar to other drugs, we do not know the type (beer, wine, and/or liquor) or amount of alcohol used by our participants. Research should better quantify alcohol consumption to examine continuous relationships between IPV and alcohol use.

Conclusion

We examined the association between IPV experiences and substance use in MSM living with HIV sampled from Taipei City. Our analyses showed that experiences of different kinds of IPV were associated with higher risk of substance use in the previous week, in particular, use of alcohol, other drugs, and multiple substances concurrently. These findings suggest that IPV experiences may be a significant risk factor for increased

Key Considerations

- Substance use is associated with risk behaviors and poor health outcomes for PLWH, including MSM living with HIV.
- Among MSM living with HIV, those who experience IPV are also more likely to report greater depressive and anxiety symptoms compared with those not experiencing IPV.
- The heightened risks of substance use in MSM who experience IPV might be related to using substances as a coping method to manage the mental health sequelae of IPV.
- Routine screening for IPV and substance use in MSM living with HIV is warranted in clinical settings.

substance use and a motivating factor for maintaining ongoing substance use. Conversely, increased substance use may also be a risk factor for IPV perpetration and victimization. Awareness of PLWH IPV history may be useful for health care providers who need to assess comprehensive HIV management and well-being to better meet these individuals' needs. Research should focus on early detection of IPV experiences in PLWH to prevent substance use and associated problems.

Disclosures

The authors report no real or perceived vested interests related to this article that could be construed as a conflict of interest.

Acknowledgments

We gratefully acknowledge all the study participants, without whom, it would not have been possible to complete these projects. This publication resulted (in part) from research supported by NINR under Award Numbers (K23NR14107; PI: Chen, Wei-Ti), NIMHD (R03MD012210; PI: Chen, Wei-Ti), and NIMH (P30MH058107; PI: Shoptaw, Steven J.). In addition, the research project was supported by DOH101-DC-1004 from the Taiwan Centers for Disease Prevention and Control (PI: Chuang, Peing). The contents of this article are solely the views of the authors and do not represent the official views of the National Institutes of Health.

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