Substance Abuse, Violence, and HIV in Women: A Literature Review of the Syndemic

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Abstract

Women in the United States are increasingly affected by HIV/AIDS. The SAVA syndemic—synergistic epidemics of substance abuse, violence, and HIV/AIDS—is highly prevalent among impoverished urban women and potentially associated with poor HIV outcomes. A review of the existing literature found 45 articles that examine SAVA's impact on (1) HIV-associated risk-taking behaviors, (2) mental health, (3) healthcare utilization and medication adherence, and (4) the bidirectional relationship between violence and HIV status. Overall, results confirm the profound impact of violence and victimization and how it is intertwined with poor decision making, increased risk taking and negative health consequences, particularly in the context of substance abuse. Among current findings, there remain diverse and inconsistent definitions for substance abuse, violence, mental illness, adherence, and healthcare utilization that confound interpretation of data. Future studies require standardization and operationalization of definitions for these terms. Development and adaptation of evidence-based interventions that incorporate prevention of violence and management of victimization to target this vulnerable group of women and thereby promote better health outcomes are urgently needed.

Introduction

NUMEROUS BARRIERS TO MEDICAL CARE may prove insurmountable to socioeconomically marginalized women with or at risk for HIV. Although several issues have been proposed as potential barriers to care, one of the most salient is the SAVA syndemic or the confluence of substance abuse, violence, and HIV/AIDS. "SAVA syndemic" is an anthropologic term coined to define the concurrent, intertwined, and mutually reinforcing health and social problems of substance abuse, violence, and HIV/AIDS that plague the urban poor.¹ As it was originally conceptualized, this syndemic is not merely the colocation of substance abuse, violence, and HIV in time and place but rather the synergistic way in which these three epidemics interact to impose an excess burden of disease on vulnerable populations.² The SAVA concept could be extended, however, to include other population groups and rural communities because of the high prevalence of concurrent HIV, violence, and substance abuse among U.S. women overall.

Since HIV was first identified, HIV-related morbidity and mortality have declined in the United States.³ This decline is multifactorial and has resulted from public awareness campaigns, widespread efforts to identify individuals with HIV, improvements in laboratory diagnosis, advances in anti-

retroviral medication development, and an increased number of individuals receiving treatment. Despite these improvements, there have been no reductions in the estimated 56,300 incident HIV cases annually, in which 31% involve high-risk heterosexual contacts, mostly among women.⁴ In 2007, women represented 27% of new HIV infections in the United States, up 8% from 2004, and 7.5 per 100,000 women were diagnosed with AIDS.⁵ As the epidemic of HIV/AIDS among women burgeons, it disproportionately affects the lives of urban, poor women, primarily those of racial/ethnic minority groups.³ HIV/AIDS, therefore, only compounds the impact of other comorbid chronic conditions, such as hypertension, diabetes, and obesity, thus contributing to health disparities.¹

Like HIV, the epidemic of violence represents a real health threat to U.S. women. According to the National Violence Against Women survey, 52% of 8000 surveyed women in the United States reported being physically assaulted as a child or adult (extrapolating to 1.9 million women nationwide), and 18% of women surveyed experienced completed or attempted rape during their lifetime. Of the women who reported adulthood rape or physical assault, 76% were abused by intimate partners.⁶ In the most recent National Crime Victimization Survey, the annual rate of nonfatal intimate partner victimizations in the United States was 4.3 per 1000 adult women.⁷

Likewise, the epidemic of substance abuse is increasingly affecting women in the United States. According to the most recent National Survey on Drug Use and Health, rates of current illicit drug use among women aged ≥ 12 have been rapidly rising while remaining stagnant for their male counterparts. It is estimated that 6.4% of women currently meet criteria for substance dependence or abuse, although this is likely an underestimate of the true prevalence of disease because of underdiagnosis of substance abuse and the lack of sampling among those who are not housed or are within institutional or criminal justice settings.⁸

The epidemics of HIV, violence, and substance abuse, therefore, each independently contributes to a collective health burden on U.S. women, but it is their entanglement that is further explored here. The interactions of these coalescing epidemics in women's lives are complex, but efforts to examine their interface promote design of more culturally appropriate, comprehensive, and, therefore, effective models of delivering healthcare. The purpose of this article is to review the relevant literature on the SAVA syndemic among adult U.S. women and suggest gaps in our current knowledge that should be addressed by future research and interventions. Additionally, it will put forth future implications for HIV prevention and treatment for this particularly vulnerable population, especially as we attempt to make inroads into reducing incident infections. This body of literature is diverse and spans a variety of at-risk populations, including women of color, incarcerated women, injection drug users, and women of lower socioeconomic status (SES), with wide-ranging experiences of violence.

To date, three excellent reviews have been published that address certain aspects of SAVA: Maman et al. (2000),⁹ Gielen et al. (2007),¹⁰ and Campbell et al. (2008).¹¹ Of these, two^{10,11} focus exclusively on intimate partner violence (IPV), and two^{9,11} include study populations from both the United States and Africa. Collectively, these reviews identified that violence significantly contributes to HIV-associated risk taking. These reviews also found that HIV-infected women do not necessarily experience violence more frequently than their uninfected peers. All three reviews⁹⁻¹¹ concluded that an understanding about causal pathways between violence and HIV risk would be strengthened by the use of standardized definitions of violence, prospective research designs, and qualitative methods to allow for cultural contextualization. None, however, described how these novel strategies should be undertaken.

The current review builds on this foundation of research to focus on several unique aspects of SAVA. These include (1) the inextricable contribution of substance abuse to the complex relationship between HIV and violence, (2) further exploration of mental illness in women experiencing violence and those at risk for HIV, and (3) an exploration of these issues among women within the criminal justice system; and most importantly (4) the current review examines SAVA as a barrier to HIV care. This topic has been rarely explored in previously published literature and has real implications for designing interventions to improve continuity of care and HIV-associated health outcomes.

Materials and Methods

A search strategy was undertaken using Pubmed, MEDLINE, Ovid SP, and PsycINFO using the following MeSH

terms: women, HIV, AIDS, substance use, substance abuse, drug dependence, heroin, cocaine, alcohol, violence, victimization, psychological and physical abuse, interpersonal violence, intervention, health service utilization, emergency room, hospitalization, antiretroviral medications, medication adherence, mental health, mental illness, depression, anxiety disorder, posttraumatic stress disorder (PTSD), and SAVA. Terms were combined in accordance with topics of interest defined in Tables 1,2,3,4,5, and 6. Additional references from seminal articles were reviewed to broaden the search and assure that important contributions were not overlooked. Articles were included for review if they were published in English between 1990 and 2010 and involved a study population of adult women (≥ 18 years) in the United States. For inclusion, studies were required to address issues of substance abuse, HIV, and violence. Interpersonal violence is described here by type (e.g., physical, sexual, emotional, or community level), timing (e.g., childhood, adult, ever during lifetime, remote, or recent), or by perpetrator (e.g., intimate partner, commercial client, or stranger) as originally described by a study's authors. For studies that also included men, only results of the female participants are described here. Major demographic characteristics and eligibility criteria of subjects were compiled to describe the study sample. Key information, including outcome measures, was directly extracted from the text. A predetermined master list of limitations was applied to each study. One author (J.P.M.) reviewed all titles from the initial search to eliminate irrelevant articles. Abstracts of all articles were then reviewed by two authors (J.P.M. and F.L.A.) to confirm inclusion based on search strategy. The same two authors then participated in full text reviews on each of the 45 articles ultimately selected, synthesizing all key findings.

Results

A review of the existing literature found 45 articles that examine SAVA's impact on (1) HIV-associated risk-taking behaviors ($n=21$), (2) mental health ($n=11$), (3) healthcare utilization and medication adherence ($n=7$), and (4) the bidirectional relationship between violence and HIV status ($n=6$).

Effect of SAVA on HIV risk-taking behavior

Among the 21 articles that addressed the impact of SAVA on HIV-associated risk-taking behaviors, 6 were from the general population, 11 were from cohorts of high-risk HIV-infected and HIV-uninfected women, and 4 were from the criminal justice system (CJS). Multiple prior studies have documented the ways in which the experience of childhood or adulthood physical or sexual abuse increases HIV risk among women. This interplay may be mediated by various factors, including (1) an established pattern of sexual risk in women who experienced childhood sexual abuse (CSA), (2) forced or threatened sex with an HIV-infected partner or a partner at high risk for HIV, (3) decreased negotiation about condom use, or (4) increased rates of high-risk activities, including exchanging sex for drugs or money and sharing needles, that occur more frequently among abused women.^{9,12-15} Psychologic reactions to abuse experiences (e.g., depression, PTSD, or substance use as a self-medicating coping strategy) may also mediate the relationship between abuse and HIV risk.^{16,17}

General population

Six studies detailed in (Table 1) examined the effect of SAVA on HIV-associated sexual risk-taking behavior in community-based cohorts in which HIV status was not known.^{12,14,18–21} All of these studies explored the associations between physical and/or sexual abuse (mostly by intimate partners) and sexual risk taking. For the most part, sexual risk taking was defined as condom nonuse or as having multiple sexual partners. Consistently, women who were substance abusers (as variously defined) were significantly more likely to experience physical or sexual violence and to engage in higher risk sexual activities. Collins et al.,¹² for example, defined risk taking by condom nonuse and by number of partners and measured both domestic violence and general victimization (sexual assault, physical assault, theft) among a community-based sample of young adults. As much as 20%–25% of the variance in high-risk sex was accounted for by substance use (particularly alcohol) and any type of lifetime victimization, especially among single women. These studies consistently demonstrated that the experience of IPV has a profound effect on women's risk-taking behaviors, especially in terms of negotiating condom use with partners. Furthermore, women with ongoing substance abuse appeared to experience more violence and to take greater sexual risks. Conversely, women who had experienced physical or sexual violence were more likely to be substance abusers.

HIV-infected and high-risk for HIV cohorts

Eleven articles (Table 2) examined the association of SAVA with sexual or drug risk taking among individuals diagnosed with or at high risk for HIV.^{15,17,22–30} Drug risk taking was variously defined as any injection drug use, recent injection drug use, any substance abuse (drugs or alcohol), or needle sharing. Sexual risk taking was described in terms of episodes of unprotected sex, having multiple sexual partners, or substance use during sex. Throughout these articles, subjects were self-defined or provider-defined as "high risk" by risky behaviors (e.g., injection drug use, commercial sex work) or solely by virtue of their presentation to sexually transmitted disease (STD) clinics.

For the most part, these studies did not address the perceived riskiness of sexual partners, excluding any possibility of HIV serosorting. Although HIV superinfection has been reported among HIV-infected persons, this phenomenon appears to be uncommon.^{31,32} Serosorting has been one way in which people with HIV engage in unprotected sexual behaviors while attempting to reduce HIV transmission to others. The individual and public health implications of HIV serosorting are incompletely understood. As an exception, in Sikkema et al.'s study²⁹ of HIV-infected men who have sex with men (MSM) and women with a history of CSA, the best predictors of having sex with HIV-uninfected partners (i.e., not serosorting) ($n = 124$) were marijuana use, higher levels of HIV-related shame, and poor coping abilities. Thus, it is not merely the experience of trauma but psychologic reactions to the traumatic experience that play a role in serosorting and sexual decision making.

The effect of remote CSA on current risk-taking behavior is seemingly different from the effect of more recent IPV, especially if violent relationships are ongoing. The translation of exposure to sexual violence in childhood into adulthood

sexual risk taking appears to be mediated by psychologic reactions to the abuse itself. Substance use and abuse frequently were reported as a coping strategy for these mental health issues and were also directly associated with heightened risk taking. The relationships between substance abuse and risk taking proved especially important among women with opioid dependence enrolled in methadone maintenance or syringe exchange programs. Psychologic sequelae of abuse in the context of substance use are explored further later.

According to one study, compared to those without a history of CSA, those with a history of CSA were 2.8 times more likely to have been commercial sex workers and 2.6 times more likely to become pregnant before age 18, but this sexual risk taking (either having many sexual partners or unprotected sex) was not associated with a significantly increased prevalence of STDs or HIV infection.¹⁵ The relatively low prevalence of HIV and STDs may reflect the low burden of disease in the setting where the study was conducted or the finding by others that many commercial sex workers, even with their many sexual partners, use condoms with their paying customers.^{33,34} All other studies did not investigate the extent to which high-risk behavior actually translates into HIV infections.

These studies consistently report associations between various types of abuse and high risk-taking behaviors in the setting of substance abuse but cannot confirm causality or establish temporality because of their cross-sectional study designs. Distinct from the other study designs, the longitudinal cohort study by El-Bassel et al.²⁵ of opioid-dependent women enrolled in methadone maintenance programs supports a causal relationship between IPV and sexual risk taking by examining changes in behavior at specific time points. Challenging prevailing paradigms, IPV and sexual risk taking were bidirectionally associated: earlier sexual risk taking was associated with subsequent IPV, and earlier IPV was associated with subsequent sexual risk taking measured as less consistent condom use.

Designing interventions to reduce risk-taking behavior, particularly among populations with or at high risk for HIV, is paramount to curbing further HIV transmission. Two interventional trials among HIV-infected and high-risk populations are reviewed here.^{26,30} Although the interventions described were somewhat effective at promoting condom use in the short term, it proved exceedingly more difficult to effectively intervene to reduce exposure to violence and needle sharing, retain these participants in the intervention, and provide durable benefits from the intervention.

Subjects within criminal justice system

Among high-risk cohorts, populations within the CJS deserve special attention. SAVA is particularly prevalent among men and women within the CJS because of high prevalence of preincarceration risky drug use and commercial sex work.³⁵ The reported prevalence of lifetime severe physical abuse among subjects in the CJS is as high as 70%,³⁶ and the prevalence of HIV is 3–4 times greater than in the surrounding communities.^{35,37–39} Four identified studies addressed HIV risk taking in the context of substance abuse in subjects within the CJS (Table 3).^{37,40–42} These studies all confirm that HIV risk is heightened in the setting of concurrent violence. Furthermore, among women within the CJS, victimization and

TABLE 1. HIV Risk Taking: GENERAL POPULATION

<i>Study author(s)</i>	<i>Study sample and design</i>	<i>Outcome measures</i>	<i>Results</i>	<i>Limitations</i>
Collins et al., 2005 ¹²	3437 young adults Cross-sectional	Substance use: frequency alcohol/marijuana use or "problem drug use" in past year Violence: IPV in past year; ASA, APA, theft in past 3 years HIV sexual risk: no. of partners, condom use in past year	All types of victimization and substance use predicted high-risk sex (>1 sexual partner and >0 unprotected sex occasions) Problem drug use, alcohol use, and victimization predicted 24.6% variance in high-risk sex among single women	Had to impute a lot of missing data Cannot determine event-level data (i.e., substance use during sex) Cannot determine causality
El-Bassel et al., 2007 ¹⁸	799 women presenting to ED Cross-sectional	Substance use: IDU Violence: physical, sexual, severe IPV in lifetime/past 6 months HIV sexual risk: HIV status, no. of partners, condom use, HIV + or IDU partner in past year	Odds of experiencing physical/sexual IPV significantly associated with having high-risk partner, having more than one intimate partner, and IDU All models confounded by homelessness.	HIV status not confirmed Did not control for mental health or formally measure substance abuse
Kalichman et al., 1998 ¹⁹	125 low-income black women in housing project Cross-sectional	Substance use: any alcohol, marijuana, cocaine, IDU, other drugs in past 3 months; lifetime problem drinking Violence: lifetime sexual coercion, lifetime physical IPV HIV sexual risk: condom negotiation, unprotected sex in past 2 weeks, high risk last sexual encounter	Sexually coerced women more likely to have used marijuana, crack cocaine, and abused alcohol compared to noncoerced women ($p < 0.01$ for each drug) Sexually coerced women also more likely to have experienced physical IPV ($p < 0.04$)	Possible selection bias Risk of social desirability bias
Stockman et al., 2010 ²⁰	5857 women with recent male sex partner Cross-sectional (part of National Survey of Family Growth)	Substance use: crack, cocaine, binge drinking in past year Violence: lifetime sexual coercion, coercion at sexual debut HIV sexual risk: multiple partners in past year, condom use at last sexual encounter	Coerced sexual debut significantly associated with having multiple sex partners, recent unprotected sex, and substance abuse. Those given alcohol/drugs at time of coercion more likely to report multiple sex partners (OR 1.47, 1.01-2.13) or substance abuse (OR 1.64, 1.10-2.42) Likelihood of any drug use increased with exposure to nonpartner sexual assault (OR 8.82) Likelihood of any unprotected sex increased with exposure to nonpartner sexual assault (OR 5.64)	Nonstandardized definitions of substance abuse HIV status unknown
Walters et al., 1999 ²¹	68 American Indian women Cross-sectional	Substance use: alcohol intoxication, any drug use in past 6 months Violence: lifetime physical or sexual assault HIV sexual risk: no. of partners, condom use in past 6 months and lifetime	Women with recent IPV more likely to experience abuse upon requesting a condom and less likely to use condoms No difference between abused and not abused women in terms of recent alcohol or marijuana use	Small number Vague definitions of trauma and drug use
Wingood et al., 1997 ¹⁴	165 black women from single neighborhood Cross-sectional	Substance use: alcohol and marijuana use in past month Violence: verbal/physical IPV with condom negotiation; physical IPV in past 3 months HIV sexual risk: condom use with primary partner in past 3 months	Women with recent IPV more likely to experience abuse upon requesting a condom and less likely to use condoms No difference between abused and not abused women in terms of recent alcohol or marijuana use	Did not consider: Duration of relationship with abuser or primary partner HIV status Drug abuse other than alcohol or marijuana

APA, adulthood physical assault; ASA, adulthood sexual assault; ED, emergency department; IDU, injection drug use; IPV, intimate partner violence; OR, odds ratio.

TABLE 2. HIV RISK TAKING: HIV-INFECTED AND HIGH-RISK FOR HIV COHORTS

<i>Study author(s)</i>	<i>Study sample and design</i>	<i>Outcome measures</i>	<i>Results</i>	<i>Limitations</i>
Bogart et al., 2005 ²²	286 WSM, 148 MSW, 292 MSM who were HIV + Cross-sectional (part of HCSUS)	Substance use: any substance use during sex with primary partner in past 6 months Violence: sexual/physical IPV in past 6 months HIV sexual risk: unprotected sex with primary partner in past 6 months	Female IPV perpetrators (24.9% of women in study) more likely to have unprotected sex with primary partners; varied by substance use during sex after adjusting for demographic variables and CD4 count.	Vague definition of substance abuse Did not assess risk with nonprimary partners Did not ask about HIV status of partner
Clum et al., 2009 ¹⁷	40 HIV + women with history of childhood abuse Cross-sectional, qualitative	Substance use: any drug use in past 4 months Violence: CPA, CSA before age 18 HIV sexual risk: as described in Life Story Interview	Abuse-related psychologic distress associated with increased number of sex partners and HIV acquisition Substance use as coping strategy that also heightened risk-taking behavior.	Limited generalizability Demographics of subjects not described Small number
Cohen et al., 2000 ²⁴	1288 HIV + and 357 HIV-women Cross-sectional (part of WIHS)	Substance use: any lifetime drug or alcohol use; IDU in past 6 months Violence: CSA; lifetime and past year physical/sexual IPV HIV sexual risk: no. of partners, HIV + partners, sexual bartering in lifetime	Recent IPV associated with lifetime drug use (OR 2.07, 1.39-3.08), >10 lifetime male sex partners (OR 1.73, 1.37-2.20), and sexual bartering (1.79, 1.42-2.26)	Vague definitions of sexual risk taking and drug use/abuse
Cohen et al., 2009 ²³	214 women in MMTPs Cross-sectional	Substance use: any drug use in past 30 days Violence: CSA, CPA before age 14 HIV sexual risk: no. of partners, unprotected sex occasions in past 3 months	For women with CSA (40.2% of sample), each day of cocaine/stimulant use associated with 3% increase in unprotected sex occasions; each day of opiate use associated with 1% decrease in unprotected sex occasions	Potential for recall/social desirability bias Definition of substance use limited to recent use only CSA broadly defined
El-Bassel et al., 2005 ²⁵	405 women in MMTP Longitudinal cohort	Substance use: any illicit drug use in past 6 months Violence: severity of physical/sexual IPV in past 6 months; CSA HIV sexual risk: HIV status, having STI, sexual bartering, no. of partners, unprotected sex occasions in past 6 months Substance use: any IDU or crack use in past 6 months Violence: CPA, CSA, lifetime and past 6 months APA, ASA, physical IPV HIV sexual risk: condom use at 1 year, no. of partners, no. of HIV + partners in past 6 months	IPV prevalence 46% at baseline Significant association between earlier high-risk sex and later IPV; also significant association between earlier IPV and subsequent condom nonuse HIV – women with history of APA or ASA significantly less likely to report consistent condom use. For HIV + women, best predictor of condom use annual income; no significant effect of abuse or recent crack or IDU.	Did not control for: Access to and utilization of health-care services Effect of methadone maintenance itself Used nonstandardized measures of abuse Risk of recall bias
Hamburger et al., 2004 ²⁶	214 HIV + and 189 high-risk women Longitudinal cohort (part of HERS)			

(continued)

TABLE 2. (CONTINUED)

<i>Study author(s)</i>	<i>Study sample and design</i>	<i>Outcome measures</i>	<i>Results</i>	<i>Limitations</i>
Plotzker et al., 2007 ²⁷	113 women at needle exchange sites Cross-sectional	Substance use: all IDU Violence: CSA, CPA HIV risk: no. of partners, # HIV + partners, sexual bartering in past 6 months; needle sharing in past 6 months	CSA significantly associated with sexual risk and drug risk. PTSD/depression explained 32% variability in drug risk after correcting for age, employment, CSA and CPA	Cannot conclude causality Small subgroups Did not quantify drug use other than baseline IDU
Senn et al., 2006 ²⁸	827 men and women at public STD clinic Cross-sectional (part of larger RCT)	Substance use: harmful alcohol use in past year, any drug abuse in past year Violence: CSA; lifetime physical IPV HIV sexual risk: concurrent substance use and sex in past year; no. of partners, condom use, STIs, sexual bartering in past 3 months	CSA associated with greater number of sexual partners and increased likelihood of bartering sex. For women, association between CSA and no. of sexual partners mediated by IPV and substance use concurrent with sex	Cannot conclude causality in cross-sectional design
Sikkema et al., 2009 ²⁹	132 women, 124 MSM with HIV and CSA Cross-sectional	Substance use: any alcohol, marijuana, cocaine/crack use in past 4 months Violence: CSA before age 18 HIV sexual risk: condom use, no. of partners, HIV + partners in past 4 months Substance use: recent alcohol or drug use; lifetime IDU Violence: any IPV in past 3 months HIV risk: unprotected sex, needle sharing in past 30 days	Best predictor of unprotected sex for women was cocaine/crack use (OR 2.67 (1.13-5.39))	Narrow time frame of behavior examined Gender may have been confounded by sexual orientation
Weir et al., 2008 ³⁰	530 HIV – but high-risk recently incarcerated women RCT		Participants in both intervention groups had significantly less unprotected sex at 9 month follow-up but no difference in terms of needle sharing or odds of experiencing IPV	Not all participants had current partners or history of IPV Small no. of IDUs Did not control for time since or duration of incarceration Homeless women excluded
Zierler et al., 1991 ¹⁵	186 high-risk or HIV + men and women Longitudinal cohort	Substance use: lifetime drug or alcohol use Violence: CSA; lifetime ASA HIV sexual risk: lifetime unprotected sex, sexual bartering, no. of partners, STIs	Women with history of CSA vs. those without CSA more likely to have IDU (prevalence ratio 1.2) and engage in heavy alcohol use (prevalence ratio 2.0)	Multiple other possible confounders (e.g., living situation, type of abuse and abuser, mental health) Cannot claim causality Possible recall bias

CPA, childhood physical abuse; CSA, childhood sexual abuse; HCSUS, HIV Cost and Services Utilization Study; HERS, HIV Epidemiology Research Study; MMTP, methadone maintenance treatment program; MSM, men having sex with men; MSW, men having sex with women; PTSD, posttraumatic stress disorder; RCT, randomized controlled trial; STD, sexually transmitted diseases; STIs, sexually transmitted infections; WIHs, Womens Interagency HIV Study; WSM, women having sex with men.

sexual risk taking appear to be moderated by contextual factors, such as substance abuse and relationship to one's sexual partner.

Effect of SAVA on mental health

Eleven studies (Table 4) were found that describe the relationships between SAVA and mental health in the context of HIV-associated sexual risk taking.⁴³⁻⁵³ Mental health issues were identified as described by study authors in terms of drug or alcohol use disorders, depression, PTSD, IPV-related PTSD, mania, psychosis, personality disorders, or mental health problems requiring treatment. Where identified by the study authors, validated measures to assess mental illness are stated. Consistently throughout, women who were actively engaged in drug abuse (particularly alcohol) tended to be more educated or acculturated and to take on greater sexual risk in terms of choice of partner and condom nonuse. Sexual behaviors were found to be especially risky when substance use occurred during sex, possibly because of poor decision making that occurred through substance-induced disinhibition.^{54,55} Although IPV-related PTSD does correlate with substance abuse and sexual risk taking in some studies, the results are inconsistent. This discrepancy may be related to difficulties controlling for the many possible confounders inherent to this relationship. Only one study⁴⁶ measured concurrent IPV, depression, and active substance abuse, finding that this trifecta correlated with increased sexual risk taking.

Effect of SAVA on healthcare utilization and combination antiretroviral therapy adherence

Previous health services research has demonstrated that HIV-infected patients come to the emergency department (ED) more frequently than their uninfected counterparts (125.6 vs. 28.9 visits per 100 persons per year) and are more likely to be admitted to the hospital.⁵⁶ ED use correlates with high primary care clinic use, current or former illicit drug use, Medicaid enrollment, and female gender, but not with any biologic markers of HIV severity.⁵⁶ If this pattern of frequent healthcare utilization is not driven by health issues themselves, there are likely other contributing factors external to the actual ED visit. Given the impact of violence on mental health, substance abuse, and risk taking already discussed, this health-seeking behavior may, in part, also be influenced by experiences of violence. In fact, victimization was included as a predisposing determinant of health behaviors in the Behavioral Model for Vulnerable Populations.⁵⁷ As Cohen et al. write²⁴, p564: "Women who experience ongoing abuse that is unrecognized or unaddressed by providers may not be empowered to make the healthiest choices to reduce risk, improve their health, or obtain the most complete and effective care for their HIV infection."

Seven studies (Table 5) describe the impact of SAVA on healthcare utilization and cART adherence among HIV-infected women.⁵⁸⁻⁶⁴ Healthcare utilization encompasses ED visits, hospitalizations, adherence to or nonuse of combination antiretroviral therapy (cART) despite medical indication for therapy, attendance at outpatient HIV clinics or nonuse of outpatient services, and use of mental health services. Depending on how healthcare utilization, substance abuse, and interpersonal violence were defined, these studies demonstrated that recent or ongoing IPV has a significant effect on

healthcare decision making. This relationship is strongest in the context of alcohol abuse or current illicit drug use and appears to disproportionately affect black women regardless of their SES. Surprisingly, there was little correlation between abuse or drug use and adherence to cART, perhaps because the reported adherence relied on self-report measures (rather than objective measures or biologic outcomes, such as HIV-1 RNA levels that are closely correlated with medication adherence or persistence).⁶⁵ Only a small proportion of the study sample was actually prescribed cART, perhaps suggesting that either such women were not personally accepting therapy (representative of poor decision making) or their providers were withholding therapy for other reasons.⁶¹

In Lichtenstein's qualitative interviews with abused women, IPV was clearly identified as a barrier to consistent HIV-related outpatient follow-up.⁶⁰ Because the qualitative nature of this study allowed for broader contextualization of violence and healthcare use, the role of drug abuse within the cycle of domestic violence became apparent. Participants described how abusive partners introduced them to drugs and supported their persistent engagement in drug use as a means to further manipulate the relationship. Other components of IPV, however, including deprivation of transportation or money, were considered more important barriers to appropriate HIV care and outpatient follow-up. Consistent longitudinal care has been shown to be necessary and effective for HIV care, but it is not known to what extent more episodic and sporadic healthcare utilization patterns impact HIV biologic outcomes in abused women.

HIV status and violence

Six studies (Table 6) describe the relationships between HIV status and violence in the context of substance abuse.⁶⁶⁻⁷¹ This complex bidirectional interaction is investigated in terms of (1) differences in victimization experiences between HIV-infected and HIV-uninfected women, (2) the association between violent experiences and incident HIV acquisition, and (3) disclosure of HIV status within violent intimate relationships. The prevalence of physical and sexual abuse among HIV-infected and high-risk women in these studies was high. For example, 50% of commercial sex workers reported abuse by paying partners and 73% by their intimate partners,⁶⁸ and 32% of HIV-infected female outpatients reported a history of lifetime sexual abuse.⁶⁷ According to these studies, HIV-infected women do not necessarily experience interpersonal violence more frequently than their HIV-uninfected counterparts, especially after controlling for age and income. HIV-infected women do, however, appear to have higher levels of psychologic distress and depression associated with victimization. Regardless of HIV status, women with less stable living situations (including homelessness and ongoing substance abuse) are more likely to experience violence. This has important public health implications for HIV prevention efforts, as violence may further marginalize a population already at high risk for HIV because of drug use and sexual bartering.

There is a growing body of literature that describes how the disclosure of HIV status to a partner actually elicits violence, especially within the context of already abusive relationships. Gielen et al.⁶⁶ demonstrated the difficulty in quantifying HIV disclosure-related violence, however, and found that those

TABLE 3. HIV RISK TAKING: SUBJECTS WITHIN CRIMINAL JUSTICE SYSTEM

<i>Study Author(s)</i>	<i>Study sample and design</i>	<i>Outcome measures</i>	<i>Results</i>	<i>Limitations</i>
Cole et al., 2007 ⁴⁰	673 women with protective orders against male partners Cross-sectional	Substance use: any illicit drug use, alcohol/drug abuse or dependence in past year Violence: lifetime and past year physical, sexual, emotional IPV HIV sexual risk: no. of partners, unprotected sex in past year	Best predictors of sexual risk: age, length of relationship to partner, severity of physical abuse, concurrent alcohol/illicit drug use/dependence Sexual risk-taking not limited to abusive partners	Limited generalizability Unknown temporal relationship between abuse and sexual risk taking within relationship
Harris et al., 2003 ⁴¹	170 female recently released prisoners Cross-sectional (part of larger intervention)	Substance use: any lifetime drug use Violence: lifetime community violence; any IPV HIV sexual risk: lifetime unprotected sex, age of sexual debut	Substance users 8 times more likely to be victims of community violence postincarceration Victimization co-occurred with substance use and high-risk sexual behaviors	Subjects evaluated at inconsistent time points Some measures not standardized, possibility of recall bias
Hutton et al., 2001 ⁴²	36 HIV + and 141 HIV – female prisoners Cross-sectional	Substance use: IDU in past 5 years; lifetime heroin/cocaine dependence Violence: CSA, CPA before age 16; lifetime ASA, APA, witness to violence, fire HIV risk: no. of partners, sex while intoxicated, sexual bartering, anal intercourse, needle sharing in past 5 years	PTSD significantly associated with HIV risk behaviors (especially repetitive anal sex and sexual bartering for cocaine)	Limited generalizability Unusually broad definitions of trauma and abuse
Ravi et al., 2007 ³⁷	1588 HIV – newly incarcerated women Cross-sectional	Substance use: >6 months use of cocaine or heroin in lifetime Violence: any lifetime physical or sexual abuse HIV sexual risk: unprotected sex with primary or nonprimary partner; lifetime sexual bartering	Women with history of physical violence only less likely to use condoms with primary partners than women without history of violence after controlling for race, employment, sex work, drug use, and having nonprimary partners	Did not assess: Whether sexual partner is perpetrator of violence Perceived riskiness of partner

TABLE 4. SUBSTANCE USE/ABUSE AND MENTAL HEALTH

<i>Study author(s)</i>	<i>Study sample and design</i>	<i>Outcome measures</i>	<i>Results</i>	<i>Limitations</i>
Axelrod et al., 1999 ⁴⁵	270 HIV + and 140 HIV – women Cross-sectional (part of WFP)	Substance use: lifetime alcohol or drug abuse Violence: lifetime physical or sexual IPV Other mental health issues: depression, anxiety, PTSD	HIV status and IPV victimization independently associated with any psychological distress, even after controlling for socioeconomic status and substance abuse	Risk of social desirability and recall bias HIV status not verified
Burke et al., 2005 ⁴⁷	310 HIV + and 301 HIV – low-income women Cross-sectional (part of Project WAVE)	Substance use: lifetime any drug use, IDU, alcohol abuse Violence: lifetime physical or sexual IPV	HIV + women with history of cocaine use more likely to experience physical IPV than women without cocaine history (OR 1.73, no confidence interval reported)	Did not distinguish recent from remote experiences of IPV Nonstandardized measures of substance abuse Risk of recall bias Did not control for PTSD/depression
Cavanaugh et al., 2009 ⁴⁸	135 HIV – low-income women with history of IPV Cross-sectional	Substance use: alcohol or drug use problems in past 6 months Violence: CPA, CSA; sexual IPV in past 6 months Other mental health issues: IPV-related PTSD HIV sexual risk: unprotected sex, HIV + partner, sexual bartering in past 6 months	Women with IPV-related PTSD 4 times more likely than those without PTSD to have recent sexual risk behavior Drug problems not a mediator of this relationship.	Small sample size Risk of selection bias
González-Guarda et al., 2008 ⁴⁴	82 Hispanic women Cross-sectional (part of Project DYVA)	Substance use: any alcohol or drug use during sex Violence: recent physical or sexual IPV HIV sexual risk: unprotected sex, STIs, HIV testing in past 3 months; no. of lifetime partners	Women with substance use during sex more educated and acculturated, more likely to have high-risk partner Consistent condom use independent of IPV	Nonstandardized measures of substance abuse and IPV
Johnson et al., 2003 ⁴⁶	420 black women with active substance abuse Cross-sectional (part of EachOne TeachOne study)	Substance use: any current use Violence: lifetime physical/sexual abuse HIV sexual risk: lifetime STI; sexual bartering, no. of partners, substance use during sex in past 30 days Other mental health issues: major depression	Compared to active drug users, women with active drug use, violence, and depression more likely married, have used alcohol before age 15 (OR 2.50) and have multiple current sexual partners (OR 2.26)	Limited generalizability Did not exclude women who were not sexually active Broad definition of violence

(continued)

TABLE 4. (CONTINUED)

<i>Study author(s)</i>	<i>Study sample and design</i>	<i>Outcome measures</i>	<i>Results</i>	<i>Limitations</i>
Kalichman et al., 2002 ⁴³	242 men, 110 women, 5 transgender who were HIV + Cross-sectional	Substance use: any alcohol or drug use in past 3 months Violence: lifetime physical/sexual abuse HIV sexual risk: no. of partners, unprotected sex in past 3 months Other mental health issues: depression, PTSD, anxiety, pessimism, personality disorders	History of sexual assault (45% of sample) more likely to also experience physical abuse. Controlling for gender/HIV symptoms, history of sexual assault associated with treatment for mental health problems but not with recent substance use	Did not quantify duration of abuse or type of abuser Recall/social desirability bias (relied on self-report) Possible sampling bias (convenience sample)
Liu et al., 2006 ⁴⁹	148 HIV + women with CSA Cross-sectional (part of WHP)	Substance use: lifetime "hard drug" use; any problem drinking or drug use in past month Violence: CSA before 18 years old Other mental health issues: depression, anxiety, self-esteem, self-efficacy, PTSD	Duration of CSA highest association with substance abuse but not significant predictor of PTSD symptoms No association between psychiatric history and substance abuse	Did not control for types or extent of substance abuse Did not control for subjects' race/ethnicity; few European American women in sample
Meade et al., 2009 ⁵⁰	70 women and 82 men with severe mental illness Cross-sectional	Substance use: lifetime alcohol or drug use disorder Violence: lifetime physical or sexual abuse Other mental health issues: all with baseline severe mental illness HIV sexual risk: lifetime no. of partners, sexual bartering, STIs	CSA significant predictor of lifetime substance abuse CSA or CPA significant predictors of adult victimization and lifetime HIV risk	Small sample size Possible selection bias Limited generalizability
Newcomb et al., 2004 ⁵¹	79 HIV + and 34 HIV – Latinas Cross-sectional (part of WFP)	Substance use: lifetime drug use; alcohol problems in past 12 months Violence: lifetime ASA; physical IPV in past 6 months Other mental health issues: depression	HIV status/adult trauma more highly associated with depression and drug use than either factor alone Higher education associated with higher rates of substance abuse	Small number with heterogeneous sample and large number of variables Cannot conclude causality
Stoner et al., 2008 ⁵²	161 sexually active female social drinkers RCT	Substance use: all baseline social drinkers, given various doses of alcohol in study Violence: lifetime ASA; lifetime physical IPV Other mental health issues: sexual assertiveness	Dose-related relationship between alcohol and decreased perceived consequences of unprotected sex Women with IPV or ASA had decreased baseline sexual assertiveness.	Vague description of adult victimization Unable to explain why women with history of ASA feared violence even with new partners
Wenzel et al., 2004 ⁵³	460 women in shelters, 438 women in low-income housing Cross-sectional	Substance use: alcohol or drug use disorder in past year Violence: APA or ASA in past year Other mental health issues: lifetime mania/psychosis HIV sexual risk: no. of partners, sexual bartering, needle sharing, unprotected sex in past year	Among sheltered women, higher rates of substance abuse, violence, HIV risk Strongest association between drug use and HIV risk in sheltered women.	Multiple possible confounders Sampling bias Risk of social desirability bias with face-to-face interviews

DYVA, Drogas y Violencia en las Américas; WAVE, Women, AIDS, and the Violence Epidemic; WFP, Women and Family Project; WHP, Women's Health Project.

TABLE 5. HEALTH CARE UTILIZATION AND CART ADHERENCE

<i>Study author(s)</i>	<i>Study sample and design</i>	<i>Outcome measures</i>	<i>Results</i>	<i>Limitations</i>
Cohen et al., 2004 ⁵⁸	1219 HIV + women Cross-sectional (part of WIHS)	Substance use: lifetime alcohol or illicit drug use Violence: any lifetime and past year physical or sexual abuse Health services: HAART nonuse despite clinical indication for therapy	Best predictors of HAART nonuse: current crack/cocaine/heroin use, history of physical/sexual abuse, being nonwhite In multivariate analysis, same factors persistent over 18-24-month period	Used nonstandardized and very broad definitions of violence and substance abuse
Eisenman et al., 2003 ⁵⁹	2466 HIV + men and women enrolled in HIV care Cross-sectional (part of HCSUS)	Substance use: drug/alcohol dependence in past year Violence: physical IPV since HIV diagnosis Health services: no. of hospital, ED, clinic, mental health visits in past 6 months	For women, experience of violence increased odds of mental healthcare use after adjusting for past year drug/alcohol dependence (OR 2.94 (1.47-5.92))	Nonstandardized definition of violence Multiple possible confounders not taken into account (including psychiatric comorbidities)
Lichtenstein et al., 2006 ⁶⁰	50 HIV + women with history of IPV Cross-sectional, qualitative	Substance use: lifetime alcohol or drug abuse Violence: lifetime physical or sexual abuse Health services: domestic violence as barrier to HIV care	Drug addiction a significant component of domestic abuse cycle Partner manipulation through drug use a barrier to keeping medical appointments	Risk of sampling bias Small number
Liebschutz et al., 2000 ⁶²	50 HIV + women initiating HIV care Cross-sectional	Substance use: lifetime IDU or alcohol abuse Violence: lifetime physical or sexual abuse (self-reported and reported in medical record) Health services: no. of and reasons for ED, hospital, and clinic visits in past 2 years	Any abuse associated with higher risk of episodic diseases, STIs, pain syndromes and ED visits/hospitalizations Women with abuse also more likely to report alcohol problems	Did not use standardized measures of abuse Did not distinguish qualities of abuse (e.g. perpetrator, duration, type)
Liebschutz et al., 2005 ⁶¹	276 men and 73 women HIV + with alcohol problems Cross-sectional (part of HIV-ALC)	Substance use: lifetime alcohol or drug use severity; alcohol or drug use in past 30 days Violence: childhood, lifetime, and past 6 months physical or sexual abuse Health services: no. of ED, hospital, and clinic visits in past 6 months; HAART adherence	Only recent violence associated with higher health care utilization and greater drug use severity No association between any violence and HAART adherence Black ethnicity/depression independently associated with greater substance abuse	Self-report of healthcare use (social desirability bias) Few subjects on HAART Lack of consistent follow-up Few women
Meade et al., 2009 ⁶³	268 HIV + men and women with history of CSA Cross-sectional (part of larger interventional study)	Substance use: alcohol and drug use in past 4 months Violence: CSA before age 18 Health services: no. of ED, clinic, mental health, substance abuse treatment visits in past 4 months; adherence to ART in past week	Best predictors of no outpatient treatment: being black, poor social support, abstaining from any drug use Best predictors of ED use: HIV symptoms, binge drinking, and any illicit drug use	Risk of selection bias Possible unreliability of self-reported health services utilization
Wyatt et al., 2005 ⁶⁴	74 HIV + black women with history of CSA Cross-sectional (part of WHIP)	Substance use: lifetime "regular drug use, lifetime IDU, problem drug use in past year, problem drinking in past year Violence: CSA before age 18 Health services: barriers to care, communication with providers	83% reported regular substance use, mostly marijuana Most common barriers to healthcare: confidentiality, money, waiting too long, caring for others, problem getting appointment	Small number Potential for sampling bias Did not answer main question of association of substance abuse with barriers to healthcare

ART, antiretroviral therapy; HAART, highly active ART; HIV-ALC, HIV Alcohol Longitudinal Cohort.

TABLE 6. HIV STATUS AND VIOLENCE

<i>Study author(s)</i>	<i>Study sample and design</i>	<i>Outcome measures</i>	<i>Results</i>	<i>Limitations</i>
Bedimo et al., 1997 ⁶⁷	238 HIV + women in HIV clinic Cross-sectional	Substance use: lifetime drug use Violence: lifetime sexual abuse HIV status-related measures: CD4 count, mode of HIV acquisition	After adjustment for age, women with temporary living situation, history of drug use, school dropouts more likely to have experienced lifetime sexual abuse	Limited definition of sexual abuse ("Have you been raped or forced to have sex against your will?") Did not report timing of abuse (i.e., recent vs. remote/childhood)
El-Bassel et al., 2001 ⁶⁸	106 CSWs at STD clinic Cross-sectional	Substance use: current alcohol use, drug use, methadone treatment; visiting crack houses in past year Violence: physical or sexual commercial IPV in past year; CPA, CSA before age 18 HIV status-related measures: self-reported HIV status	Risks for physical/sexual commercial IPV were: homelessness, sex work as main source of income, HIV +, current IDU, having sex at crack houses	Limited generalizability Self-report of HIV status Did not control for STIs or unprotected sex as possible confounders
Gielen et al., 2000 ⁶⁶	310 HIV + women Cross-sectional, mixed methods	Substance use: lifetime hard drug use Violence: lifetime physical or sexual IPV HIV status-related measures: time since diagnosis, no. of disclosures of HIV status, disclosure-related violence	IPV after HIV disclosure associated with IPV before disclosure and hard drug use Only 4% of women experienced abuse directly related to disclosure event, but 13% reported IPV started only after HIV status disclosed	Risk of recall bias Did not describe whether subjects disclosed serostatus to abuser
Gruskin et al., 2002 ⁶⁹	741 HIV + and 346 HIV – women Longitudinal cohort (part of HERS)	Substance use: current alcohol or drug use Violence: APA, ASA in past 6 months during time in study (recent abuse at baseline excluded) HIV status-related measures: CD4 count	Predictors of ongoing APA/ASA: alcohol abuse, drug use, current IDU, and multiple sex partners regardless of HIV status Rates of abuse less for HIV + women with CD4 <350 vs. >350 (HR 0.55, 0.36-0.82) HIV + women more likely to experience repeated episodes of abuse by single partner, more likely to have alcohol involved in situation of abuse	High dropout rate
McDonnell et al., 2003 ⁷⁰	310 HIV + and 301 HIV – low-income urban women Cross-sectional, mixed methods	Substance use: lifetime illicit drug use; drug or alcohol use in setting of abuse Violence: CPA, CSA before age 18; lifetime physical or sexual IPV; lifetime APA, ASA HIV status-related measures: self-reported HIV status	HIV + women more likely to experience repeated episodes of abuse by single partner, more likely to have alcohol involved in situation of abuse	Cannot establish causality Significant differences between HIV + and HIV – women in terms of age and income
McDonnell et al., 2005 ⁷¹	188 HIV + and 257 HIV – low-income urban women Cross-sectional	Substance use: illicit drug use in past 30 days Violence: physical or sexual abuse in past year HIV status-related measures: HRQOL, documented HIV status	HIV + status negatively associated with all measures of HRQOL (except mental health) after controlling for IPV and substance use Significantly lower HRQOL if HIV + and experienced IPV in past year (43% of sample.)	Did not control for HIV health (e.g., CD4 count, viral load, whether or not on HAART)

CSW, commercial sex worker; HR, hazard ratio; HRQOL, health-related quality of life.

who experienced this type of abuse had lower educational levels and had experienced other negative consequences as a result of disclosure. Although the studies described here primarily focus on the interactions between violence and HIV itself, all note the exacerbation of violence in the setting of substance abuse.

Discussion

The body of literature described here details the SAVA syndemic—the complex intertwining of abuse experiences with sexual risk taking, drug risk taking, substance abuse, mental health, healthcare utilization, HIV medication adherence, and HIV disclosure. These experiences affect women's lives and decision making in a complex and continuous way and, thus, have significant public health implications for designing interventions to curb the spread of HIV and engage already HIV-infected women in cohesive and continuous models of care. Nowhere is there more urgency for considering abuse than in our nation's most vulnerable populations, including the urban poor, women of color, and women involved in the CJS. Women disenfranchised and destabilized by low SES, homelessness, imprisonment, or minority race/ethnicity are only further marginalized by HIV diagnoses, ongoing violence, mental health disorders, and drug addiction. To truly address the needs of this population, we must consider the compound burden of these epidemics and deal with them in a comprehensive and culturally meaningful way. On a clinical basis, this implies using multidisciplinary approaches to effectively screen for substance abuse, depression or PTSD, and violence in the setting of HIV care. Such an approach could be employed in a wide range of clinical settings, including the ED, hospital, correctional setting, or HIV specialty clinic. In addition, targeted interventions might involve offering violence prevention education or coping skills in addition to substance abuse treatment programs, including medication-assisted therapy.

It is apparent from the peer-reviewed literature that substance abuse plays a pivotal role in perpetuating cycles of IPV and maintaining power imbalance within a relationship, heightening HIV-associated sexual risk-taking behaviors, and moderating the relationship between abuse and healthcare decision making. Substance abuse is likely also intertwined with psychologic reactions to violence, although it is unclear from the existing literature which precedes the other. The most effective epidemiologic studies of HIV among U.S. women and targeted interventions for vulnerable populations should thus address the inextricable linkages among violence, HIV, and substance abuse.

In terms of the effect of violence on healthcare utilization patterns, it is still unclear from existing data why the experience of abuse affects healthcare decision making. Potential explanations include mistrust in healthcare or in providers,^{72–74} concurrent substance abuse that interferes with other activities, or concurrent mental health issues, such as depression or PTSD, that either reduce motivation for health seeking or paralyze positive self-health promotion. Alternatively, current healthcare systems and individual providers may be poorly equipped with resources to engage abused women, especially those with active substance use disorders. Women experiencing ongoing mental health issues and violence might be especially isolated and marginalized; they are, thus,

in greatest need of provider time and energy. The available results provide little mechanistic insight to shed light on future intervention development. This may represent an area for future research.

Limitations

This review has several limitations that deserve mention. Although the search strategy was designed to be comprehensive, there may have been relevant published articles from other databases that were missed, representing a possible selection bias. This review focuses exclusively on SAVA among U.S. women, which may not be generalizable to other international populations of women, especially those in resource-limited settings. In those settings, the relationship among violence, substance abuse, and HIV may be shaped by the coexistence of extreme poverty, lack of access to basic healthcare, high prevalence of HIV and commercial sex work, or culturally condoned violence against women. Varying cultural norms and expectations about the role of women in society further shape the local epidemiology of violence, HIV, and substance abuse.

Beyond the search strategy, this literature review is also limited in several respects by the available studies themselves. First, there are inconsistencies across studies in defining and measuring violence, drug use, and mental health. This limited our ability to draw concise conclusions about patterns of behavior. For example, PTSD diagnosis was frequently used as a surrogate marker of prior abuse, which may or may not be accurate. Second, some of the included studies involved cohorts whose HIV status was unknown or not biologically confirmed. Biologic markers of disease severity (including CD4 count and HIV viral load) were infrequently described for HIV-infected subjects; these certainly are markers of access and adherence to cART. Consequently, there is a risk for misclassification: in women whose HIV-1 RNA levels are fully suppressed or who serosort with HIV-infected partners, exposure risk to sexual partners is markedly reduced, and unprotected sex could be considered relatively low-risk sexual encounters.^{75,76} Third, studies with cross-sectional designs limit one's ability to infer causality, and few of the studies included event-level data that might have better disentangled the temporal relationships among violence, drug use, and high-risk sexual encounters. Finally, because many of the described studies are retrospective, they were limited by recall bias and thus lacked a degree of granularity that may have provided alternative insights. For example, it is unclear from the existing literature whether or not the recipient of a subject's HIV diagnosis disclosure, the subject's abuser, and the subject's primary sexual partner were the same person. Future qualitative research may help further contextualize these issues.

Directions for future research

Future studies should attempt to analyze more completely and prospectively these experiences of abuse by using both qualitative and quantitative methods of research. Mixed-method research strategies, such as life story interviews or focus groups, allow for reflective first-person narratives structured around interviewers' central topics of interest. They might be used to differentiate details of the abusive situation, including the type of partner or perpetrator, duration

of the relationship, duration of the abuse, and time course of the abuse, to eliminate possible confounders found in more traditional cross-sectional studies.^{77,78} Qualitative narrative interviews might also be able to define the time course of discrete life events (such as initiation of drug use or initiation and duration of abuse), although these studies may have limited generalizability because of a focus on one individual's experience. Alternatively, experience sampling methods may be suitable for successfully linking the impact of one behavior on another.⁷⁹ This methodology involves having subjects record thoughts or reactions at specific time points, an approach that allows for assessment of behaviors or intervention effects in a natural setting.⁸⁰ By employing longer-term longitudinal designs, studies might be better able to support causality of abuse, decision making, and HIV incidence, although these would understandably be more costly and time-consuming to perform. Most importantly, future studies will require use of consistent definitions, including those for violence, drug use, and mental illness, as well as creation or adaptation of evidence-based interventions that promote better health outcomes that target this vulnerable group. Future research may help answer those remaining questions and guide providers to better screen for abuse, counsel victims of violence, and engage women more effectively in continuous healthcare to curb HIV-associated morbidity and mortality.

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