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The Association Between Poly-Substance Use, Coping, and Sex Trade Among Black South African Substance Users

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Abstract

The current study examined the relationship between poly-substance use and sex trade among 343 black South African substance users recruited from the Pretoria region between 2002 and 2006 (57% males; mean age 24 years). The assessment comprised a HIV-risk behavior interview, urinalysis to confirm self-report of drug use, and an HIV test. Logistic regression analyses indicated poly-substance use was positively associated with sex trade among persons using drugs to cope with stress. Results indicate the importance of considering coping strategies as modifiable psychosocial factor related to sexual risk-taking behaviors and substance use. The study's implications and limitations are discussed.

RÉSUMÉ

L'étude courante a examiné le rapport entre l'utilisation de poly-substance et le commerce de sexe parmi 343 utilisateurs sud-africains noirs de substance recrutés de la région de Pretoria entre 2002 et 2006 (mâle de 57%; âge moyen 24 ans). L'évaluation a été composée d'une entrevue de comportement de HIV-risque, de l'analyse d'urine pour confirmer l'individu-rapport de l'utilisation de drogue, et d'un essai d'HIV. Les analyses logistiques de régression ont indiqué qu'utilisation de poly-substance a été franchement associée au commerce de sexe parmi des personnes employant des drogues pour faire face. Les résultats indiquent l'importance de considérer des stratégies de faire face comme le facteur psychosocial modifiable s'est relié au risque sexuel prenant des comportements et l'utilisation de substance. Les implications et les limitations de l'étude sont discutées.

RESUMEN

El estudio actual examinó la relación entre el uso de la poly-sustancia y el comercio del sexo entre 343 usuarios negros de la sustancia del africano del sur reclutados de la región de Pretoria entre

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Declaration of Interest

The authors report no conflict of interest. The authors alone are responsible for the content and writing of this paper.

2002 y 2006 (varón del 57%; edad media 24 años). El gravamen fue abarcado de una entrevista del comportamiento del VIH-riesgo, de urinalysis para confirmar el uso de la droga, y de una prueba del VIH. Los análisis logísticos de la regresión indicaron que uso de la poly-sustancia fue asociada positivamente a comercio del sexo entre las personas que usaban las drogas para hacer frente. Los resultados indican la importancia de considerar estrategias que hacen frente como el factor sicosocial modificable se relacionó con el riesgo sexual que tomaba comportamientos y uso de la sustancia. Se discuten las implicaciones y las limitaciones del estudio.

Keywords

poly-substance use; coping; sex trade; South Africa; HIV/AIDS; sex differences; cocaine; marijuana; heroin

Introduction

Presently, South Africa is experiencing one of the most devastating human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS) epidemics in the world. At least 20% of the population aged 15–49 years is thought to be infected, with the majority of HIV/AIDS cases being among black South Africans (AIDS Epidemic Update, 2006). Coinciding with the HIV/AIDS epidemic is the increasing rate of illicit drug usage among black Africans (Parry et al., 2002; Parry, Pluddemann, and Myers, 2005, 2007; Pluddemann, Myers, and Parry, 2008). For example, the proportion of patients treated for cocaine use-related problems, who were black Africans, increased significantly from 4.8% in 1999 to 12.5% in 2006 (Parry et al., 2007). In addition, in the Province of Gauteng, where Johannesburg and Pretoria are located, the proportion of heroin using patients in treatment facilities, who are black, has continued to increase. The current estimated rate is 35% (Pluddemann, Parry, and Bhana, 2008). Inevitably, the growing usage of psychoactive drugs will exasperate an already devastating HIV epidemic fueled by sexual transmission (Kalichman et al., 2006; Leggett, 1999; Needle et al., 2008; Parry, Petersen, Carney, Dewing, and Needle, 2008a; Parry et al., 2008b; Wechsberg, Luseno, Lam, Parry, and Morojele, 2006). As rate of substance usage increases in South Africa, there is an urgent need to identify risk and protective factors¹ for substance use and high-risk sexual behaviors.

Until recently, little attention has been given to drug using populations in South Africa and the intersection between substance use and sex trade (Parry and Pithey, 2006). However, empirical data from other countries demonstrate an overlap between substance use and high-risk sexual behaviors, such as sex trade. Furthermore, it has become evident that sexual risk associated with drug use tends to vary with type of drug used as well as types of sexual interactions (Celentano, Latimore, and Mehta, 2008). For example, there is a plethora of

¹The reader is asked to consider that the concepts and processes of “risk” and “protective” factors”, often noted in the literature—need to be delineated in terms of their dimensions (linear, non-linear), its “demands”, the critical necessary conditions (endogenously as well as exogenously; from a micro to a macro level) which are necessary for either of them to operate (begin, continue, become anchored and integrate, change as de facto realities change, cease, etc.) or not to and whether their underpinnings are theory-driven, empirically-based, individual and/or systemic stake holder-bound, historically based, based upon “principles of faith” or what. Editor’s note.

international studies demonstrating that the highly addictive nature of crack cocaine increases sexual risk-taking behaviors (e.g., transactional sex) (Baseman, Ross, and Williams, 1999; Celentano et al., 2008; Leggett, 1999; McCoy, Lai, Metsch, Messiah, and Zhao, 2004; Parry et al., 2008a, 2008b; Shannon, Bright, Gibson, and Tyndall, 2007; Wechsberg et al., 2006). On the other hand, the relationship between heroin use and high-risk sexual behavior is less consistent and may be more situational. For example, Strathdee and Sherman (2003) found that using heroin was associated with higher acquisition of sexually transmitted diseases among women in the United States. Yet, this was only the case when the female used heroin with her main sex partner (Strathdee and Sherman, 2003).

As the rate of illicit drug usage increases among black South Africans, understanding the relationship between high-risk sexual behaviors (e.g., sex trade) and substance use is of considerable importance. Historically, in sub-Saharan African countries, including South Africa, social and economic conditions have forced adolescent and young adult females to engage in sex trade to obtain food, shelter, and other necessities. Consequently, females involved in transactional sex and their clients have played a key role in the spread of HIV and for maintaining high HIV infection rate in sub-Saharan Africa (Chen et al. 2007; Ramjee and Gouws 2002; Ramjee et al., 1998; Voeten et al., 2007; Wang et al. 2007; Williams 2003). Recent studies have reported that the HIV/AIDS rate among sex workers in urban and mining areas of South Africa ranges from 34% to 69% (Dunkle et al., 2005; Parry et al., 2008b; Wojcicki and Malala, 2001).

In light of the well-established link between drug consumption epidemics and sexually transmitted HIV/AIDS epidemics throughout the world, there is an urgent need to design effective interventions for high-risk groups. However, before effective interventions can be designed, researchers must identify risk and protective factors associated with substance use and sexual risk-taking behaviors and understand how these factors interact to place South Africans at an increased risk for contracting HIV.

Stress is among the psychosocial factors concomitantly linked to substance use and sexual risk-taking behaviors (e.g., sex trade and having multiple partners). In South Africa, research has linked stress resulting from structural and social factors (e.g., unemployment, violence, and sub-standard housing) to individual substance use and high-risk sexual behaviors (Kalichman, Simbayi, Jooste, Cherry, and Cain, 2005; Kalichman et al., 2006; Parry et al., 2008b). For example, Kalichman and colleagues (2005) found that HIV/AIDS risks were closely related to experiences of poor education, unemployment, and perceived seriousness of lacking basic living resources. Perceived community stress was also related to alcohol and drug use (Kalichman et al., 2005, 2006). Similarly, US-based studies have found that stress is associated with increased risk for substance use among adolescents and young adults (Castellani, Wedgeworth, Wootton, and Rugle, 1997; Lanier, Nicholson, and Duncan, 2001; Laurent, Catanzaro, and Callan, 1997; Wills, 1986; Wills and Hirky, 1996; Wills, Sandy, and Yaeger, 2001; Wills, Sandy, Yaeger, Cleary, and Shinar, 2001). Employing latent growth analysis, Wills et al. (2001) have found that negative life events were related to higher initial levels of substance use and greater rate of growth in substance use. According to the stress-coping model of addiction, individuals likely use psychoactive substances as a means to remove themselves from experiencing or thinking about stressful situations (Aldridge and

Roesch, 2008; Billings and Moos, 1981; Carver, Scheier, and Weintraub, 1989; Kalichman et al., 2006; Roth and Cohen, 1986).

The aim of the present study is to shed light on coping and substance use patterns associated with buying and selling sex among a sample of substance users. It is hypothesized that using substances to cope with stress will be related to participation in sex trade. Based on extant literature suggesting differential effects of drugs on sex behavior, we hypothesize that specific patterns/types of substance use will moderate the relationship between the use of drugs to cope with stress and sex trade. Understanding psychosocial and substance use factors associated with engagement in sex trade has the potential to improve HIV prevention intervention by allowing researchers and clinicians to target specific malleable behaviors and psychosocial factors.

Methods

Study Site

The present study represents a sub-sample of the International Neurobehavioral Study of HIV (NEURO-Study), an epidemiological examination of neuropsychological, social, and behavioral risk factors of HIV, and Hepatitis A, B, and C with sites in the United States, South Africa, and Russia. The current sample only includes substance users from Pretoria, South Africa. Pretoria, the administrative capital of South Africa, has a population of approximately 2 million people (the majority is black). Although Pretoria has South Africa's third largest economy, the unemployment rate is high and poverty is widespread among black Africans. Accompanying the post-apartheid social and economic challenges is an HIV epidemic. The Gauteng province of South Africa, which encompasses Pretoria, is the home of an estimated 5.5 million HIV-infected people (UNAIDS/WHO, 2006).

Participant Demographics

Between 2002 and 2006, 385 black drug users residing in Pretoria and surrounding informal settlements enrolled in the NEURO-Study. To be eligible for the study, participants had to be in the age group of 18–40 years, report using injection or non-injection drugs during the previous 6 months, and live in or around Pretoria. In addition, participants were required to be able to speak and understand English. Approximately half the sample (57%) consisted of males and the mean age was 24.4 years ($SD = 4.73$ years). Most of the participants (98%) had never married. Approximately 25% of the participants graduated high school and less than 5% of the sample was employed.

Procedures and Instruments

The Johns Hopkins Bloomberg School of Public Health Institutional Review Board (IRB) approved the NEURO-Study for use in South Africa. Local human subjects' approvals were obtained via the South African Medical Research Council's FWA Human Subjects Assurance. Each key investigative team member completed the Johns Hopkins University IRB training module for conducting human subjects' research. Assessment clinicians who underwent extensive training, including instructions in conducting the HIV risk interview and administering the neuropsychological assessment and completion of a HIV pre- and

post-test counseling training course, conducted all assessments and counseling sessions. In addition, regular team meetings led by the project coordinator provided ongoing supervision and training for assessment clinicians.

Trained project staff recruited study participants from a variety of community-based sources in the Pretoria region. Recruitment involved street outreach in Pretoria and surrounding informal settlements, treatment programs, bars, local emergency rooms, and health clinics. Informed consent was obtained during the initial visit prior to the assessment and participants received financial remuneration (150 ZAR for the assessment and 50 ZAR for transportation, a total of about US\$25) for completing the assessment.

Measures

The assessment comprised a standardized face-to-face HIV-Risk Behavior Interview and a battery of neuropsychological tests, a blood draw, and a urine sample collection. Prior to collecting specimens, each participant received pre-test HIV counseling, which included a detailed explanation of HIV and HIV testing, risk-reduction counseling pertinent to HIV/AIDS and other STDs, as well as referral information for community-based drug user treatment and social services. Trained medical professionals collected urine and blood samples from participants to validate self-report of recent substance use and to ascertain HIV status. Urine was analyzed for the presence of psychoactive substances, including cannabinoids, cocaine, opiates, and mandrax (a sedative drug often combined with marijuana and smoked). HIV testing included the standard ELISA screening and confirmatory Western Blot analysis. A pathology laboratory operated by national pathology service performed diagnostic substance use and HIV testing. Referrals to drug and HIV treatment facilities were provided to all study participants following established protocols.

The HIV-Risk Behavior Interview was originally adapted from a similar interview used for the REACH study (Vlahov, Anthony, Celentano, Solomon, and Chowdhury, 1991) and included questions on demographics and medical, educational and neurodevelopmental histories, and detailed behavioral information about drug use and sexual practices. The adapted interview was pilot-tested with South African drug users prior to use in the study. Detailed measures included on a range of drugs used by type, route of administration, frequency, and quantity, including tobacco, alcohol, marijuana, heroin, other opiates, cocaine, mandrax, and other drugs. Measures on drug-related HIV-risk behaviors included drug use cessation and relapse, risky injection practices (i.e., direct and indirect syringe sharing), and injection in high-risk contexts (e.g., shooting galleries). Measures on sexual practices included the number and types of partners (e.g., gender, steady partner, casual partner), type(s) of sexual acts (e.g., oral, vaginal, and anal intercourse), condom use, sex trade (e.g., sex for money, drugs, shelter, food, and protection), and self-report of STD. The present paper focuses on the following measures:

Exchange of sex for drugs or money: Four questions assessed involvement in sex trade, which are as follows: (1) Has anyone ever given you drugs to have sex? (2) Has anyone ever paid you money, given you shelter, or given you anything other than drugs to have sex? (3) Have you ever given anyone drugs to have sex with you? (4) Have you ever

given anyone money, shelter, or anything other than drugs to have sex with you? A dichotomous variable was created for the purpose of data analysis. If participants answered “yes” to one of the four questions, they were placed in the sex trade group (yes = 1). Individuals who did not report any involvement in buying or selling sex served as the reference group (no = 0).

Motivation for drug use: One question assessed the degree to which individuals used drugs to cope. Participants were asked to indicate on a Likert-type scale from 1 (strongly disagree) to 4 (strongly agree) how much they agreed with the following statement: “Using drugs helps you deal with your problems.” For the purpose of data analysis, a dichotomous variable was created (strongly agreed/agreed = 1 and strongly disagreed/disagreed = 0).

Illicit substance use: Each participant’s urine was collected and tested for the presence of psychoactive drugs including marijuana, cocaine, opiates, and mandrax. For the purpose of data analysis, participants were grouped into one of the three categories based on the results of the urine screening (single drug group = 0, two-drug group = 1, and three-drug group = 2).

Alcohol use: Alcohol usage was measured via self-report. Participants were asked to indicate the number of days they drank alcohol in the seven days prior to being administered the assessment. Based on descriptive statistics three groups were created (did not drink alcohol = 0, used alcohol for one day during the past week = 1, and used alcohol for two or more days during the past week = 2).

HIV/AIDS status: HIV testing included the standard ELISA screening and confirmatory Western Blot analysis.

Data Analysis

Of the 385 participants enrolled in the study, 40 did not test positive for any psychoactive drug and were not included in the present analyses. It should be noted that these participants did not differ from the final sample on demographics and sex trade behaviors. Because of inconsistent data, an additional two participants were dropped from the final analyses. Thus, the final sample consisted of 343 current substance users. Using the final sample of 343 active drug users, we conducted a series of logistic regression analyses to determine the strength of the relationship between substance use behaviors and transactional sex. Gender, age, education, and alcohol use were included in the analyses to control for their potential effects. All analyses were conducted using SPSS 15.0.

Results

Sample Characteristics

Table 1 provides a description of the sample. Approximately one-third of the sample tested positive for HIV/AIDS. Urinalyses indicated that the majority of the sample used more than one drug. For example, approximately one-third of the sample tested positive for marijuana, cocaine, and heroin. Only one participant indicated lifetime use of injection drugs. Rates of

substance use did not vary across coping groups (Chi-square (df) = 3.9(2), $p = .14$). For example, among persons using drugs to cope, substance use rates were 38.8%, 31.9%, and 29.4% for the single drug use group, two-drug group, and three-drug group, respectively. Among individuals who did not use drugs to cope, the rates were 33%, 27.5%, and 39.6% for the single drug use group, two-drug group, and three-drug group, respectively (Chi-square (df) = 3.9(2), $p = .14$). Approximately 38% endorsed buying or selling sex. The rate of sex trade for persons who did not use drugs to cope was 29.1% compared with 47.5% among persons who used drugs to cope (Chi-square (df) = 12.24(1), $p < .001$). Rate of sex trade significantly differed across substance usage groups (Chi-square (df) = 8.08(2), $p < .05$). Specifically, among individuals testing positive for a single drug, the sex trade rate was 31%. For the two-drug group, the sex trade rate was 24.8% and the rate was 44.2% among persons testing positive for three drugs.

Full Model: Factors Associated With Sex Trade

Multiple logistic regression was used to model sex trade on demographic variables, coping, and substance use patterns. Interactions were assessed in terms of coping and poly-substance use. A final model with good fit using the Hosmer and Lemeshow Lack of Fit Test (Chi-square (df) = 11.08(8), $p = .19$) and a global null hypothesis test (Chi-square (df) = 147.03(13), $p < .001$) included the interaction term coping and poly-substance use (Chi-square (df) = 5.24(2), $p < .10$) (see Figure 1). The model accounted for 48% of the variance in sex trade.

Stratified Model: Multiple Logistic Regression

Given the significant interaction between use of drugs to cope and poly-substance use, stratified analysis was used to compare the adjusted odds for sex trade of persons who used drugs to cope versus individuals who did not use drugs to cope. That is, a multiple logistic regression model was estimated separately for persons who used drugs to cope and persons who did not use drugs to cope. Using the same covariates in each of the stratified models as that of the overall model, the global fit statistics test (Chi-square (df) = 68.33(10), $p < .001$) for substance users who used drugs to cope is still good. Likewise, for substance users who did not endorse the use of drugs to cope, the global fit statistics test (Chi-square (df) = 82.46(10), $p < .001$) indicates that the covariates included in the model adequately explain sex trade odds.

Factors Associated With Sex Trade Among Persons Using Drugs to Cope

Adjusted odds ratio (AOR) results in Table 2 indicate that gender, age, alcohol use, and poly-substance use were related to sex trade. Specifically, females had 14 times the odds of males to engage in sex trade (95% CI = 5.88–33.68). Persons between 18 and 20 years of age were more likely to engage in sex trade compared to persons between 29 and 38 years of age (AOR = 4.2; 95% CI = 1.28–14.03). Similarly, persons between 21 and 23 years of age were more likely to engage in sex trade compared to persons between 29 and 38 years of age (AOR = 4.1; 95% CI = 1.17–14.28). Drinking alcohol on two or more days in a week prior to the survey was associated with sex trade (AOR = 4.1; 95% CI = 1.01–17.08). In addition, a relationship emerged between poly-substance use and sex trade. Specifically, testing positive for three drugs (i.e., marijuana, heroin, and cocaine) was associated with

participation in sex trade (AOR = 4.2; 95% CI = 1.37–12.62). A trend between testing positive for two drugs (i.e., heroin and marijuana) and sex trade also emerged (AOR = 2.7; 95% CI = 0.96–7.58).

Factors Associated With Sex Tirade Among Persons Who Do Not Use Drugs to Cope

Among substance users who did not use drugs to cope, gender, age, and education were related to involvement in sex trade. Females had 42 times the odds of males to be involved in exchanging sex for drugs or money (95% CI = 12.12–142.61). Younger age was also associated with participating in sex trade. Specifically, persons aged 18 to 20 years were 14 times more likely to participate in trading sex compared to persons between 29 and 38 years of age (95% CI = 3.17–59.29). Substance users aged 21 to 23 years were 3.9 times more likely to participate in buying or selling sex than persons aged 29 to 38 years (95% CI = 1.17–13.08). Also, persons between 24 and 28 years of age were 7.4 times more likely to engage in trading sex than their older counterparts (95% CI = 1.99–27.48). Only having an elementary education was related to involvement in transactional sex (AOR = 7.2; 95% CI = 1.68–30.57), and attending but not graduating high school was associated with involvement in buying or selling sex (AOR = 5.1; 95% CI = 1.58–16.61). An inverse trend in an association between sex trade and testing positive for two drugs was evident (AOR = 0.32; 95% CI = 0.08–1.22). The findings are summarized in Table 3.

Discussion

Consistent with previous data, in our sample poly-substance use was common (Parry et al., 2008b). Specifically, approximately 27% of the sample tested positive for two drugs (e.g., marijuana and heroin), while 35% of our sample tested positive for three drugs (i.e., heroin, cocaine, and marijuana). Almost half (47%) indicated the use of drugs to cope. Approximately one-third of the sample indicated they had engaged in selling or buying sex. Presently, the rate of sex trade was higher among persons who used drugs to cope compared to the rate of sex trade among individuals who did not use drugs to cope. In addition, different patterns of association between sex trade and drug use emerged for persons who used drugs to cope compared to persons who did not use drugs to cope.

Among persons who used drugs to cope, a positive trend emerged for the association between the two-drug combination group (i.e., marijuana and heroin) and sex trade. That is, individuals who tested positive for heroin and marijuana were more likely to report engaging in sex trade. In addition, among persons who used drugs to cope, a relationship between membership in the three-drug combination group and sex trade emerged. Specifically, 60% of the persons who tested positive for three drugs (i.e., marijuana, cocaine, and heroin) compared to 37% of those who tested positive for one drug (i.e., marijuana only) were involved in exchanging sex for drugs or money.

Research suggests, often the type of drug used depends on numerous factors, including expectations about the pharmacological and behavioral effects (Needle et al., 2008; Parry et al., 2008a). For example, in South Africa and the United States sex trade workers indicate using cocaine to increase and maintain confidence and energy, as well as to cope with the stress or the negative affect associated with sex trade (Needle et al., 2008; Parry et al.,

2008b; Young, Boyd, and Hubbell, 2000). In addition, findings from a study of 52 drug-using sex workers in three cities in South Africa indicated that among sex workers the choice and timing of the drug depended on the expectations about the drug effects. Specifically, male and female sex workers reported using crack cocaine prior to going out to work or having sex (Needle et al., 2008). Wechsberg et al. (2006) found almost 75% of persons engaging in transactional sex in the Pretoria region of South Africa reported daily use of cocaine. On the other hand, heroin and marijuana are used to diminish the effects of stimulants (e.g., cocaine) used before engaging in sex trade. Needle et al. (2008) reported sex trade workers in their study indicated using marijuana to relax after sex or at the end of the work day.

Given the high rate of commercial and survival sex in South Africa, it is likely that the many of individuals reporting using drugs to cope engaged in sex trade prior to initiating cocaine and heroin use. Consequently, persons reporting using drugs to cope are likely commercial sex trade workers who engage in substance use to help deal with the distress and feelings of shame and guilt that often accompany sex trade work (Needle et al., 2008; Young et al., 2000). It is not uncommon for individuals with inadequate social support and resources to engage in emotional-based or avoidance-coping strategies, such as substance use, to deal with stress (Anderson, Ramo, and Brown, 2006; Kalichman et al., 2006; Stein, Dixon, and Nyamathi, 2008; Wills and Hirk, 1996; Wills, Sandy, and Yaeger, 2001).

In contrast, among persons who did not use drugs to cope, factors related to sex trade included gender, age, and education. Persons between the ages of 18 and 20 years had the greatest odds of being involved in sex trade. The rate for 18 to 20 years old persons was 26% compared to 17% among persons from 29 to 38 years of age. Among persons who graduated high school, 19% engaged in sex trade. Rates of sex trade were higher among persons who did not attend or complete high school. The rate of sex trade among persons who did not attend high school was 24% and the rate among persons who attended but did not complete high school was 57%. Finally, an inverse relationship between sex trade and the two-drug group approached significance. That is, among individuals who did not use drugs to cope, those who tested positive for marijuana and heroin were less likely to engage in sex trade.

In extant literature, heroin use is associated with decreased sexual desire. Consequently, among heroin users there is a reduced likelihood of engaging in high-risk sexual behavior by virtue of the pharmacological effects of heroin (Mirin, Meyer, Mendelson, and Ellingboe, 1980; Needle et al., 2008; Parry et al., 2008a). Another plausible explanation is persons who did not use drugs to cope, who tested positive for heroin and marijuana were not involved in sex trade or as commercial sex worker prior to initiating substance use and continue not to be involved in sex trade. The current study's findings suggest substance users in South Africa are a heterogeneous group, which likely includes commercial sex workers who use drugs to cope and substance users who do not engage in sex trade and do not appear to use drugs to cope with their problems.

Study Limitations

The present study is characterized by a few limitations that must be considered when drawing conclusions. First, because of the cross-sectional nature of the data, we are unable

to determine causality. It is unclear whether substance use is the driving force behind involvement in sex trade or is a coping response to deal with involvement in sex trade. However, given the low educational attainment and employment rates of the sample (e.g., approximately 95% of the sample did not have regular employment and only 25% completed high school), the men and women in our study likely experience stress related to social and economic deprivation. Further, given the socioeconomic characteristics of the sample and plethora of literature on sex trade and HIV in southern Africa, it is plausible that many of our participants engaged in sex trade before becoming involved with heavy drug use. Another limitation centered on sample size and characteristics. A larger sample size would likely yield a statistically significant relationship between the two-drug user groups and sex trade and result in smaller confidence intervals for the effects of gender on sex trade among substance users who do not use drugs to cope. With regard to sample composition, ethnic/racial groups other than blacks (i.e., colored and white South Africans) are not represented in the study sample, thereby limiting the generalizability of the findings. Next, the sampling plan for this study involved community-based target sampling methods using word of mouth and street outreach for recruitment. The use of non-random sampling methods may have inherent biases associated with the selection of the sample from the population. However, the sampling frame could not be easily defined for this hidden population and therefore a random sampling plan for informal settlements was not feasible (Heckathorn, 1997). Finally, given that the foci of the original study did not include coping, a comprehensive measure of coping was not available. Nonetheless, the single item measure provides some insight into the potential importance of considering coping strategies when designing interventions. Future studies should include a comprehensive measure of perceived stress and coping.

Conclusions

Despite these important limitations, the present study provides contributions to HIV/AIDS and substance use literature with respect to insights into possible foci of prevention programs targeting risk populations in South Africa. Individual-level interventions aimed at improving coping skills through teaching adaptive coping strategies and enhancing cognitive skills (e.g., problem-solving and decision-making) have the potential to reduce HIV risk-taking behaviors (e.g., substance use and risky sexual behaviors) among black South Africans. Specifically, HIV prevention interventions targeting sex trade workers should focus on reducing risk for becoming involved with drugs by targeting malleable coping and problem-solving skills, in addition to reducing the number of sex partners and increasing condom use. Among substance using persons who are not engaged in sex trade, HIV interventions focused on reducing substance use and sexual risk-taking behaviors are needed. In light of the rising use of low quality heroin and cocaine mixed with marijuana, often referred to as “sugars” in South Africa (Pluddemann, Parry, and Bhana, 2008), substance use interventions should be tailored to warn of the current danger associated with using marijuana, given persons may be unaware that small amounts of cocaine and heroin have been mixed with the marijuana. Finally, the urgent need to implement structural interventions focused on improving social and economic conditions of black South Africans remains essential in the fight against HIV/AIDS.

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Figure 1.
The interaction between sex trade and poly-substance use.

Table 1.Descriptive statistics ($N = 343$)

	<i>N</i> (%)
Gender	
Male	181 (52.6)
Female	162 (47.4)
Age (years)	
18–20	84 (24.6)
21–23	85 (24.9)
24–28	84 (24.3)
29–38	90 (26.3)
Education	
Less than high school	106 (30.9)
Some high school	163 (47.5)
Graduated high school	74 (21.6)
Recent substance use	
Marijuana only	113 (32.9)
Cocaine only	9 (2.6)
Heroin only	0
Marijuana and cocaine	5 (1.5)
Marijuana and heroin	93 (27.1)
Cocaine and heroin	4 (1.2)
Marijuana, cocaine, and heroin	119 (34.7)
Past week alcohol use	
No use	252 (73.5)
1 day	44 (12.8)
2 or more days	47 (13.7)
Drugs to cope	160 (46.6)
Sex trade	129 (37.6)
HIV/AIDS	104 (32.2)

Table 2.

Association between substance use factors and transactional sex among South African substance users who use drugs to cope ($N = 161$)

Covariates (N)	Prevalence (%)	OR	95% CI	AOR	95% CI
Gender					
Female	75.5	10.3	4.95–21.29	14.07***	5.88–33.68
Male	23.3	1.0	—	1.0	—
Age (years)					
18–20	63.0	4.50	1.79–11.24	4.24**	1.28–14.03
21–23	58.8	3.77	1.42–9.97	4.08**	1.17–14.28
24–28	40.0	1.76	0.69–4.49	0.96	0.29–3.15
29–38	27.5	1.0	—	1.0	—
Education					
Less than high school	44.4	0.58	0.25–1.41	0.75	0.24–2.33
Some high school	45.2	0.61	0.26–1.39	0.69	0.24–1.97
Graduated high school	57.6	1.0	—	1.0	—
Alcohol use					
2+ days	50.5	1.17	0.52–2.64	1.64	0.53–5.06
1 day	52.6	1.31	0.49–3.46	4.15**	1.01–17.08
No use	45.9	1.0	—	1.0	—
Substance use					
Heroin, cocaine, and marijuana	59.6	2.50	1.15–5.44	4.16**	1.37–12.62
Heroin and marijuana	49.0	1.63	0.77–3.46	2.69*	0.96–7.58
Marijuana	37.1	1.0	—	1.0	—

* $p < .10$.

** $p < .05$.

*** $p < .01$.

Table 3.

Association between substance use factors and transactional sex among South African substance users who do not use drugs to cope ($N = 182$)

Covariates (N)	Prevalence (%)	OR	95% CI	AOR	95% CI
Gender					
Female	53.4	16.81	6.65–42.48	41.58 ^{***}	12.12–142.61
Male	6.4	1.0	—	1.0	—
Age (years)					
18–20	36.8	2.66	1.00–7.06	13.71 ^{****}	3.17–59.29
21–23	29.4	1.99	0.74–4.86	3.91 ^{**}	1.17–13.08
24–28	34.9	2.44	0.94–6.35	7.39 ^{***}	1.99–27.48
29–38	18.0	1.0	—	1.0	—
Education					
Elementary	25.0	1.03	0.40–2.67	7.18 ^{***}	1.68–30.57
Some high school	33.7	1.58	0.68–3.64	5.12 ^{***}	1.58–16.61
Graduated high school	24.4	1.0	—	1.0	—
Alcohol use					
2+ days	29.4	1.02	0.34–3.07	1.31	0.22–7.63
1 day	29.2	1.00	0.39–2.60	1.88	0.50–7.06
No use	29.1	1.0	—	1.0	—
Substance use					
Heroin, cocaine, and marijuana	40.3	1.71	0.82–3.55	1.99	0.64–6.13
Heroin and marijuana	14.0	0.41	0.15–1.09	0.32 [*]	0.08–1.22
Marijuana	28.3	1.0	—	1.0	—

* $p < .10$.

** $p < .05$.

*** $p < .01$.

**** $p < .001$.