

**Alcohol, Drug and Sexual Risk Behavior Correlates of Recent  
Transactional Sex Among Female Black South African Drug Users**

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## ABSTRACT

Transactional sex among black South African women has become a mode of economic survival putting them at higher risk for HIV and other infectious disease. In order to inform HIV interventions, drug and sexual risk behavior correlates of recent transactional sex among a descriptive epidemiological, cross-sectional sample of 189, black, South African women in Pretoria were examined using log binomial regression. Prevalence of HIV seropositivity was extremely high among non-transactional sex workers (47.1%) and transactional sex workers (54.6%), albeit not significantly different. Adjusted regression results indicated that the probability of transactional sex was greater for drug using women who tested positive for cocaine use (Adjusted Prevalence Ratio (APR)=1.3, 95% CI=1.1, 1.5) and knew of anyone who died of AIDS (APR =1.5, 95% CI 1.1, 2.1). The probability of transactional sex was lower for female drug users who reported greater education (APR =0.6, 95% CI= 0.4, 0.8), condom use in their first sexual encounter (APR =0.7, 95% CI=0.6, 1.0) or reported a recent steady sexual partnership (APR =0.8, 95% CI=0.7, 0.9). Drug use-related interventions for female transactional sex workers may need to focus on methods for the reduction of not only drug use, especially cocaine use, but also the reduction of sexual risk behaviors.

**Key Words:** South Africa, Substance Use, Sexual Risk Behavior

## INTRODUCTION

In South Africa, women account for 90% of new HIV infections (Rehle et al., 2007), with black South African women having greater risk for HIV infection than other demographic sub-groups. Recent prevalence estimates of HIV in black South African women aged 20 to 34 are as high as 32.7% (95% CI= 29.7%, 36.0%) (Shisana et al., 2009). Furthermore, it has been hypothesized that HIV transmission in black South African females is due to not only biological factors (e.g., modes of contact, exposure to infectious fluids and coital injury), but also behavioral factors (including sexual risk behavior fueled by alcohol and other drug use) (Kapiga et al., 2009; Simbayi et al., 2005; Vernazza, Eron, Fiscus, & Cohen, 1999). Furthermore, the social context in which these behaviors occur plays a role in the disparities observed in HIV infection (Hunter, 1993).

During Apartheid, black South Africans were denied educational attainment, employment and healthcare (Ketchen, Armistead, & Cook, 2009). Also, forced gender segregation through practices like housing policies for migrant mine workers weakened family structures and altered gender roles (Ketchen et al., 2009). The limited access to formal tertiary-level education by black South Africans, in particular women, created a dependency on male partners for financial support and social power. Legacy of Apartheid included large gender and racial disparities in social and economic life with black women being put at risk for various forms of exploitation (Dugassa, 2009; Gilbert & Walker, 2002; Hunter, 2007; Johnson, Dorrington, Bradshaw, du Plessis, & Makubalo, 2009). As a consequence, transactional sex among women has become a means of

survival which in turn has increased HIV risk (Parry & Pithey, 2006; Pauw & Brener, 2003; Wojcicki & Malala, 2001).

Furthermore, the social and economic inequalities in South Africa have placed black South African women in subordinate roles which has weakened their ability to negotiate safer sexual practices (Luke, 2005; Parry et al., 2008). This power inequality has been associated with drug use and sexual risk including lower condom use, higher prevalence and incidence of HIV and other sexually transmitted infections (STIs), high levels of sexual concurrency among women and especially their male sexual partners, and higher engagement in transactional sex (Dunkle et al., 2005; Hunter, 2007).

Female transactional sex workers because of their increased likelihood of engaging in sexual risk behaviors and drug use, have been found to have higher prevalence of HIV (Parry et al., 2008). A study of 506 females who reported alcohol use and recently engaging in sex work or unprotected sex demonstrated that females who reported transactional sex were more likely to have a history of alcohol or drug use disorder compared to females alcohol users who had not engaged in transactional sex (Wechsberg et al., 2009). This study focused on alcohol users rather than drug users.

Although drug use has been associated with sexual risk behaviors, fewer studies have researched the population of drug users in South Africa as compared to other populations (Hedden, Whitaker, Floyd, & Latimer, 2009; Kalichman et al., 2006; Leggett, 1999; Parry et al., 2008; Parry et al., 2008; Sawyer, Wechsberg, & Myers, 2006; Sher et al., 1986; Wechsberg, Luseno, Lam, Parry, & Morojele, 2006) despite the fact that based on international estimates (Shisana et al., 2009) drug users are likely to be at increased risk for HIV and other infectious disease. The most common illegal drugs used

in South Africa include cannabis, and methaqualone followed by crack cocaine, powder cocaine and heroin (Parry et al., 2002; Parry et al., 2008; Parry & Pithey, 2006), with the most common mode of ingestion being smoking; whereas, injection drug use is uncommon in South Africa. Furthermore, type of drug use generally differs by gender, race and social class (Parry & Pithey, 2006). Literature of drug use in African female transactional sex workers indicate that cocaine, especially crack cocaine is a commonly used drug in many South African inner-cities (Leggett, 1999; Needle et al., 2008; Parry & Pithey, 2006). Drug use, particularly cocaine, has been associated with lower condom use, increased number of casual partners, facilitating more frequent sexual encounters, engaging in a variety of sexual behaviors, prolonging sexual experiences and increased STI in sex workers (Leggett, 1999; Parry et al., 2008; Parry, Carney, Petersen, Dewing, & Needle, 2009; Parry et al., 2008; Pluddemann, Parry, Flisher, & Jordaan, 2008).

In summary black females bear the brunt of the HIV epidemic in South Africa (Shisana et al., 2009). Also, drug use in South Africa, although more prevalent in males (Parry & Pithey, 2006), is a major factor in drug related sexual risk behavior in females (Wechsberg et al., 2008). Furthermore due to social and economic disparities, a considerable number of black females in South Africa are involved in transactional sex which puts them at increased probability of drug use in order to cope which in turn increases the risk of HIV. In order to inform HIV prevention interventions for this high risk population, a greater understanding of the correlates associated with recent transactional sex among black South African females is needed. Therefore, the objective of the study is to explore substance use, sexual risk behavior and HIV infection status as correlates of recent transactional sex among black South African female drug users.

## METHODS

### Design

The study was part of a cross-sectional descriptive epidemiological examination of neuropsychological and social-behavioral risk factors of HIV, and viral hepatitis A, B, and C within sites in the U.S., South Africa, and Russia. The present study is based on the South Africa site, which enrolled black South Africans between 2002 and 2006 in the Pretoria region (Hedden et al., 2009).

### Participants

Recruitment involved street outreach in Pretoria and the surrounding informal settlements. Sites of recruitment included: treatment programs, bars, local emergency rooms, and health clinics. To be eligible for the study, participants had to be aged 18-40 years and report using injection or non-injection drugs during the previous 6 months. Informed consent was obtained during the initial visit prior to baseline assessment and participants received financial remuneration of 150 ZAR and an additional 50 ZAR for transportation costs.

The study comprised 410 South African drug users, 385 of whom reported their race/ethnicity as black African. This study analysis excluded a small number of white drug users recruited into the South Africa study due to substantial socioeconomic differences between white and black Africans in the study. Of the 385 black South African drug users, 195 were female and 189 had complete data.

### Measures and Procedures

Diagnostic substance use and HIV testing was carried out at a pathology laboratory operated by a national pathology services. At each assessment, blood and urine

samples were collected. HIV testing included standard ELISA screening and confirmatory Western Blots. Urinalysis assessed for the presence of psychoactive substances, including cannabinoids, cocaine, opiates and methaqualone. Referrals to drug and HIV treatment facilities were provided following established protocols.

The study assessment battery included a detailed HIV-risk behavior interview adapted from tools developed during landmark studies of HIV-risk behavior (e.g., (Vlahov, Anthony, Celentano, Solomon, & Chowdhury, 1991)) and used extensively at the US study site with adult drug users. The HIV risk behavior interview was subsequently pilot-tested with South African drug users prior to use in the study. Detailed measures of drug use and sexual risk assessment of the HIV-risk behavior has been described elsewhere (Hedden et al., 2009).

For this manuscript, recent transactional sex (past 6 months) was examined including transactional sex for money, food, shelter and drugs. Correlates included demographics of age and education status. Recent drug use was investigated by assessing participant's urine for the presence of methaqualine, cocaine, opiates, and cannabis. Problem alcohol use was ascertained for women reporting 4 or more drinks per drinking occasion for more than half the month. Sexual risk behaviors included: condom use (during first and last sexual encounter), early sexual initiation (before 15 years of age), and casual/steady partnerships.

#### Protection of Human Subjects

The study and consent forms were approved in the U.S. by the university's Institutional Review Board (FWA00000287) and in South Africa by the South African Medical Research Council's Ethics Committee (FWAIRB00001569). Informed consent

was obtained during the initial visit prior to baseline assessment. All research staff in South Africa underwent intensive HIV counseling, recruitment, and assessment training provided by local and US clinicians and researchers on issues related to ethics, recruitment and assessment protocols, HIV counseling, and crisis management.

### Data Analysis

All data were analyzed using SAS version 9.1. The sample was described using descriptive statistics for demographic data. Transactional sex was assessed for the sample overall. Transactional sex correlates included: demographic variables, drug use, sexual risk behaviors and HIV. Covariable selection for the model was based on the literature, an alpha level of 0.10 using Chi-Square tests and confounding potential. Log binomial regression models were used to calculate prevalence ratios and their 95% confidence intervals for the cross-sectional dataset (Spiegelman & Hertzmark, 2005). Simple regression models were used to compute unadjusted estimates and multiple regression was used to calculate adjusted estimates. For each covariable, missing data was less than 1%; cumulative missing data was approximately 4%. Given the small amount of missing data (<5%), a complete case analysis was utilized.

### RESULTS

Recent transactional sex was prevalent in female black South African drug users with 63.0% (n=119) of participants reporting transactional sex in the last 6 months and 66.7% (n=126) of participants reporting transactional sex in their lifetime. Of females who reported transactional sex in the last 6 months, 62.4% reported receiving money for sex, 12.2% reported receiving drugs for sex and 52.4% reported receiving something else for sex (e.g., food, shelter, etc.). The sample overall and by transactional sex status is



described in Table 1. Specifically, the sample of female black South African drug users (n=189) were more likely to be greater than 25 years of age followed by 21 to 24 year of age and less than 21 years of age. Approximately, half of female drug users were likely to report having some high school education followed by a quarter each having less than a high school education and greater than a high school education. Prevalent substance use in this sample included cannabis (78.8%), heroin (55.6%), cocaine (42.3%) and alcohol (24.9%). Urine test results indicated that all participants were negative for methaqualine.

Transactional sex workers were more likely to be older than non-transactional sex workers in the female drug using sample ( $\chi^2(df)=20.8(2)$ ,  $p<.001$ ). Also, transactional sex workers were more likely to report less education than non-transactional sex workers ( $\chi^2(df)=14.3(2)$ ,  $p<.001$ ). There were also significant differences between drug using women who reported transactional sex and those who did not report transactional sex in terms of cocaine use, with more transactional sex workers having positive urine analyses for cocaine ( $\chi^2(df)=7.5(1)$ ,  $p=.01$ ). No differences were found between drug using women involved in recent transactional sex and those not involved in recent transactional sex in terms of positive urine analyses for cannabinoids or heroin. In terms of sexual risk behaviors, transactional sex workers were less likely to use condoms in their first sexual encounter ( $\chi^2(df)=17.9(1)$ ,  $p<.001$ ) but were more likely to use condoms in their last sexual encounter ( $\chi^2(df)=13.9(1)$ ,  $p<.001$ ). Both transactional sex workers and non-transactional sex workers were equally likely to initiate sex before the age of 15. Also, transactional sex workers and non-transactional sex workers reported similar numbers of casual and steady partners. Transactional sex workers were also less likely to have a

current steady sexual partnership compared to non-transactional sex workers ( $\chi^2(df)=10.4(1)$ ,  $p<0.001$ ) Finally, HIV infection was equally prevalent in drug using participants reporting transactional sex and participants who did not report transactional sex; however, transactional sex workers were more likely to know someone who had died of AIDS ( $\chi^2(df)=5.8(1)$ ,  $p=.02$ ) compared to non-transactional sex workers.

Results of the regression analyses are in Table 2. For the unadjusted results, the probability of transactional sex is 30% higher for drug using women who tested positive for cocaine use compared to those who tested negative for cocaine use (PR=1.3, 95% CI=1.1, 1.6). Also, the probability of transactional sex was less for females reporting using a condom in their first sexual encounter (PR=0.6, 95% CI= 0.4, 0.8) but was greater for females reporting using a condom in their last sexual encounter (PR=1.7, 95% CI=1.2, 2.3). Transactional sex workers were less likely to report recent steady sexual partnerships (PR=0.7, 95% CI=0.6, 0.8). Finally, the probability of transactional sex was 50% greater for female drug users who reported knowing someone who had died of AIDS.

Adjusted results indicated that the probability of transactional sex was greater for drug using women who tested positive for cocaine use (APR=1.3, 95% CI=1.1, 1.5) and knew of anyone who died of AIDS (APR=1.5 95% CI 1.1, 2.1). The probability of transactional sex was lower for female drug users who reported condom use in their first sexual encounter (APR=0.7, 95% CI=0.6, 1.0) or reported a recent steady sexual partnership (PR=0.8, 95% CI=0.7, 0.9).

## DISCUSSION

Given the high prevalence and incidence of HIV among women in South Africa, it is imperative to learn more about behaviors associated with recent transactional sex in order to design effective HIV prevention interventions. This study is one of the few examining demographic, drug use, sexual risk behavior, and infectious disease correlates of recent transactional sex among a sample of drug using, black South African women (Wechsberg et al., 2009). Findings revealed that the majority of drug using women (63%) in this sample reported transactional sex during the previous six months. Drug using women who engaged in recent transactional sex were more likely to have less education than drug using women not involved in transactional sex. These findings are similar to existing literature that indicate that black women in South Africa are the most social and economically disadvantaged as well as the least educated making them the most vulnerable to exploitation and disease (Dugassa, 2009; Gilbert & Walker, 2002; Hunter, 2007; Johnson et al., 2009).

Recent transactional sex behavior was not associated with greater likelihood of opiate, cannabis, or problematic alcohol use in the sample of black African female drug users. These results vary from other studies which indicate that female transactional sex workers are more likely to have alcohol disorders compared to non-transactional sex workers (Wechsberg et al., 2009). Conflicting results may be due to measurement or sample differences. The present study sample was comprised of women who used drugs recently and exhibited a wide range of sexual and drug use risk behaviors.

African women who reported recent transactional sex were more likely to have a positive urinalysis for cocaine than drug using women who did not engage in recent

transactional sex. The result coincides with current literature which demonstrates that cocaine, particularly, crack cocaine is prominent in sex workers (Leggett, 1999; Parry & Pithey, 2006; Wechsberg et al., 2009). The fact that cocaine, but not heroin or cannabis, was associated with women's recent transactional sex behavior is not surprising since cocaine is a stimulant and has been associated with pro-sexual effects (Leggett, 1999). Also, qualitative studies have described the use of cocaine in transactional sex workers as a way to cope with sex work (Parry et al., 2008). More studies are needed to examine the mechanisms through which cocaine use is associated with increased risk by black African female drug users who are involved in transactional sex work.

In terms of sexual risk behaviors, women who reported transactional sex work were less likely to have a current steady sexual partner. This agrees with literature on the dependency of women's social worth and economic stability on male partnerships (Campbell, 2000). Condom use was associated with recent transactional sex behavior albeit in different directions. Women who recently traded sex were less likely to have used a condom during the first sexual intercourse and more likely to have used a condom during their last sexual intercourse. The greater likelihood for women involved in recent transactional sex to have used condoms during their last sexual encounter may be a sign that HIV prevention interventions and education have improved this high risk population's employment of safer sex practices (Shisana et al., 2009). However, 21% of transactional sex workers reported not using a condom during their last sexual episode which places that sub-group at high HIV risk.

Prevalence of HIV seropositivity was extremely high among both non-transactional sex workers (47.1%) and transactional sex workers (54.6%). While not

statistically significant, women engaging in transactional sex had the highest rate of HIV infection. Both, black South African women who use drugs and who use drugs and report transactional sex work are at exceptionally high HIV risk. The present study findings suggest that steady partnerships among non-transactional sex workers may be an important protective factor against HIV, while cocaine use and less education among transactional sex workers may be important risk factors. Further research examining relationships among HIV and risk factors characterizing each group will help to inform prevention interventions.

Study findings should be interpreted in the context of important study limitations and strengths. First, this study is cross-sectional. Therefore, conclusions cannot be drawn regarding the temporal order of variables examined. Furthermore, community-based word of mouth and street outreach were used for recruitment. While, nonrandom sampling methods may have inherent sample selection biases, the sampling frame could not be easily defined for this 'hidden population'. Also, the study sample was limited to female black Africans in the Pretoria region who use drugs; therefore, the findings may only generalize to similar drug using populations. This study also had a number of strengths including its employment of urinalyses to examine drug use and included employment of sero-tests of HIV infectivity rather than relying on self-report. Further, a high risk and understudied sample of black South African drug using women was examined quantitatively.

This study addresses an important gap in the literature by examining correlates of recent transactional sex behavior among black South African drug using women. Our finding of lower education level in transactional sex workers compared to non-

transactional sex workers is important in light of findings that young South African women who completed secondary education were less likely to have HIV infection compared to young women who completed primary education (Johnson et al., 2009). Providing access to education and therefore economic empowerment, especially for black South African women transactional sex workers, may decrease the risk of HIV infection.

Although our findings did not differentiate sex-trading drug users and non-sex trading drug users in terms of HIV status, greater urgency needs to be given to the prevention of HIV among drug using women given that the prevalence of HIV in this group overall (51.9%) and by transactional sex status was high. Therefore, drug use interventions for sex trading women may want to focus on methods for the reduction of not only drug use, especially cocaine, but also sexual risk.

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Table 1. Descriptive Statistics of Female South African Drug Users by Transactional Sex Status, 2002-2006

Variable	All n (%) n=189	Non-Transactional Sex n (%) n=70	Transactional Sex n (%) n=119	$\chi^2$ (df)	p-value
<b>Demographics</b>					
Age					
<21	39 (20.63)	24 (34.29)	15 (12.61)	20.78(2)	<.001
21 to 24	68 (35.98)	28 (40.00)	40 (33.61)		
>25	82 (43.39)	18 (25.71)	64 (53.78)		
Education					
Less than High School	48 (25.40)	8 (11.43)	40 (33.61)	14.31(2)	<.001
Some High School	94 (49.74)	37 (52.86)	57 (47.90)		
Highschool or Greater	47 (24.87)	25 (35.71)	22 (18.49)		
<b>Drug Use</b>					
Cocaine Urinalysis					
Negative	109 (57.67)	48 (68.57)	61 (51.26)	7.51(1)	0.01
Positive	80 (42.33)	22 (31.43)	58 (48.74)		
Opiate Urinalysis					
Negative	84 (44.44)	31 (44.29)	53 (44.54)	0.22(1)	0.64
Positive	105 (55.56)	39 (55.71)	66 (55.46)		
Cannabis Urinalysis					
Negative	40 (21.16)	11 (15.71)	29 (24.37)	0.57(1)	0.45
Positive	149 (78.84)	59 (84.29)	90 (75.63)		
Lifetime Self Reported Alcohol Problem Use					
No	142 (75.13)	54 (77.14)	88 (73.95)	0.14(1)	0.71
Yes	47 (24.87)	16 (22.86)	31 (26.05)		
<b>Sexual Risk Behaviors</b>					
Condom Used at First Sexual Encounter					
No	116 (61.38)	29 (41.43)	87 (73.11)	17.89(1)	<.001
Yes	73 (38.62)	41 (58.57)	32 (26.89)		
Condom Used at Last Sexual Encounter					
No	58 (30.69)	33 (47.14)	25 (21.01)	13.89(1)	<.001
Yes	131 (69.31)	37 (52.86)	94 (78.99)		
First Sexual Intercourse					
Before Age 15	158 (83.60)	56 (80.00)	102 (85.71)	0.59(1)	0.44
Never or After Age 15	31 (16.40)	14 (20.00)	17 (14.29)		

Number of Casual Partners					
'0	103 (54.50)	36 (51.43)	67 (56.30)	3.31(2)	0.19
1 to 2	43 (22.75)	21 (30.00)	22 (18.49)		
>2	43 (22.75)	13 (18.57)	30 (25.21)		
Number of Steady Partners					
0 to 1	49 (25.93)	16 (22.86)	33 (27.73)	0.41(2)	0.82
2 to 4	98 (51.85)	38 (54.29)	60 (50.42)		
>4	42 (22.22)	16 (22.86)	26 (21.85)		
Current Steady Partnership					
No	53 (28.04)	10 (14.29)	43 (36.13)	10.43(1)	0.001
Yes	136 (71.96)	60 (85.71)	76 (63.87)		
<b>Infection</b>					
HIV					
No	91 (48.15)	37 (52.86)	54 (45.38)	0.99(1)	0.32
Yes	98 (51.85)	33 (47.14)	65 (54.62)		
Know Anyone Who Died of AIDS					
No	44 (23.28)	24 (34.29)	20 (16.81)	5.79(1)	0.02
Yes	145 (76.72)	46 (65.71)	99 (83.19)		

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Table 2. Unadjusted (PR) and Adjusted Prevalence Ratios (APR) of Transactional Sex for Female South African Drug Users, 2002-2006

Variable	PR (95% CI)	APR (95% CI) <sup>a</sup>
<b>Age</b>		
<21	1.00	1.00
21 to 24	1.53 (0.98, 2.38)	1.20 (0.76, 1.88)
>25	2.03 (1.34, 3.07) <sup>b</sup>	1.38 (0.88, 2.15)
<b>Education</b>		
Less than High School	1.00	1.00
Some High School	0.73 (0.59, 0.89) <sup>b</sup>	0.83 (0.68, 1.02)
Highschool or Greater	0.56 (0.40, 0.78) <sup>b</sup>	0.59 (0.43, 0.80) <sup>b</sup>
<b>Cocaine Urinalysis</b>		
Negative	1.00	1.00
Positive	1.30 (1.05, 1.61) <sup>b</sup>	1.25 (1.05, 1.51) <sup>b</sup>
<b>Condom Used at First Sexual Encounter</b>		
No	1.00	1.00
Yes	0.58 (0.44, 0.77) <sup>b</sup>	0.72 (0.55, 0.95) <sup>b</sup>
<b>Condom Used at Last Sexual Encounter</b>		
No	1.00	1.00
Yes	1.66 (1.22, 2.28) <sup>b</sup>	1.32 (0.96, 1.81)
<b>Current Steady Partnership</b>		
No	1.00	1.00
Yes	0.69 (0.57, 0.84) <sup>b</sup>	0.78 (0.65, 0.94) <sup>b</sup>
<b>Know Anyone Who Died of AIDS</b>		
No	1.00	1.00
Yes	1.50 (1.07, 2.11) <sup>b</sup>	1.52 (1.12, 2.05) <sup>b</sup>

<sup>a</sup>Given non-convergence of the log binomial model, a log poisson model was used for estimation of the APR

<sup>b</sup>p<0.05