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Gender and Sex Trading Among Active Methamphetamine Users in Cape Town, South Africa

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Abstract

Background—South Africa has experienced a tremendous rise in methamphetamine use since the year 2000. Sex trading is a global phenomenon that has been observed in active drug users and has been associated with risks for HIV infection and violence.

Objectives—This paper describes and examines the correlates of sex trading among active methamphetamine users in Cape Town, South Africa.

Methods—Through peer referral, 360 (201 male; 159 female) active methamphetamine users were recruited in a peri-urban township. Demographics, sex trading, drug use, trauma, and mental health were assessed by a structured clinical interview and computer survey. Logistic regression models were used to examine predictors of sex trading for men and women.

Results—In the past 3 months, 40% of men and 33% of women endorsed trading sex for methamphetamine or money. Among these, they reported trading with same sex partners (33%), high rates of inconsistent condom use (73%), and incidences of physical (23%) and sexual (27%) assault when sex trading. Increased drug use severity was correlated with sex trading. Women with experiences of violence and trauma were also more likely to trade sex.

Conclusions/importance—The results stress a need for linkage to drug treatment, as addiction may be fueling sex trading. Targeted interventions geared towards safe sex practices may reduce risky sexual behaviors. Women need interventions that are attuned to their specific vulnerabilities. More research is needed to explore the experiences of men who have sex with men given their particularly high rates of sex trading behavior.

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Declaration of Interest

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

INTRODUCTION

After the fall of apartheid in 1994 and South Africa's reconnection to the international market, methamphetamine use emerged in Cape Town and the surrounding areas of the Western Cape Province. Colloquially referred to as "tik," this white, crystalline psychostimulant is generally smoked through makeshift pipes. Trends in substance use treatment services in Cape Town reflect the increasing burden of methamphetamine in this area, with the proportion of treatment seekers reporting tik as their primary drug of abuse rising from 0.1% in 2001 to an astounding 33% in 2013 (K. Johnson et al., 2014). Further, in a street intercept survey from a racially mixed Cape Town community, 18% of men and 12% of women reported ever using tik (Simbayi et al., 2006). In a more recent survey in alcohol serving venues in one Cape Town community, 6.4% of patrons reported recent tik use in the past 4 months (Meade et al., 2012). Methamphetamine is highly addictive and produces increased levels of energy and heightened alertness (Panenka et al., 2013). There is thus concern about how its consumption may be fueling hypersexuality and subsequent HIV risk in this region.

Sex trading is a global phenomenon that refers to any sort of transactional exchange of sex in return for money, drugs, or goods (Weitzer, 2000). In the international literature, sex trading is more commonly documented among women (Baral et al., 2012; Bobashev, Zule, Osilla, Kline, & Wechsberg, 2009; Latkin, Hua, & Forman, 2003). Sex trading is associated with increased risk of transmission of HIV and other sexually transmitted diseases (STDs) (Baral et al., 2012; Shannon et al., 2015), and it increases vulnerability to violence, rape, and assault (Azim et al., 2006; Church, Henderson, Barnard, & Hart, 2001; El-Bassel, Witte, Wada, Gilbert, & Wallace, 2001; Elmore-Meegan, Conroy, & Agala, 2004; Gilchrist, Gruer, & Atkinson, 2005; Inciardi & Surratt, 2001). Sex trading is observed in low-income contexts in many regions of the world, including sub-Saharan Africa, often resulting from socioeconomic pressures and constraints on resources (Gysels, Pool, & Nnalsiba, 2002; Larsen et al., 2004; Walden, Mwangulube, & Makhumula-Nkhoma, 1999).

In active drug users, sex trading has been described as being motivated by cravings and withdrawal symptoms (Ouellet, Wiebel, Jimenez, & Johnson, 1993), as well as social and economic factors like homelessness and poverty (Bobashev et al., 2009; Elwood, Williams, Bell, & Richard, 1997). Stimulants like methamphetamine and cocaine are more strongly associated with sex trading, as compared with sedatives or depressants like opioids (Elwood et al., 1997). Despite high rates of sex trading in drug users, research examining factors that might be associated with sex trading behaviors among active substance users has been largely focused on cocaine in the United States (US) and Canada. In large multi-site studies among female crack-cocaine users in the US, approximately half (44–57%) reported trading sex for drugs or money, (J. M. Edwards, Halpern, & Wechsberg, 2006; Logan & Leukefeld, 2000). Sex trading among cocaine users has been associated with heavier drug use, economic strains like homelessness or unemployment, history of child abuse, history of STDs, and psychological distress (Cavazos-Rehg et al., 2009; J. M. Edwards et al., 2006; Golder & Logan, 2007; Harzke, Williams, & Bowen, 2009; Logan & Leukefeld, 2000; Risser, Timpson, McCurdy, Ross, & Williams, 2006). Similarly, a US study of men who have sex with men (MSM) and use methamphetamine found that 43% traded sex for

methamphetamine in the past 3 months, and that sex trading was associated with homelessness, low income, and riskier sexual practices (Semple, Strathdee, Zians, & Patterson, 2010). A heterosexual sample of methamphetamine users reported lower prevalence of sex trading (26%), and correlates included engaging in anal sex, being female and homeless, and consuming greater amounts of methamphetamine (Semple, Strathdee, Zians, & Patterson, 2011).

Globally, methamphetamine consumption has been linked with sex trading and other sexual risk behaviors, including multiple sex partners and unprotected sex acts (Molitor et al., 1999; Zapata, Hillis, Marchbanks, Curtis, & Lowry, 2008). These same patterns have been observed among methamphetamine users in South Africa, among whom sex trading has been reported at high frequencies (Pluddemann, Flisher, Mathews, Carney, & Lombard, 2008; Wechsberg, Jones, et al., 2010). In one community-based study, 17% of male and 32% of female methamphetamine users reported trading sex in exchange for money and goods, a rate that was significantly higher compared to individuals not using methamphetamine (Meade et al., 2012). The methamphetamine users in that sample also reported high rates of childhood sexual abuse and physical violence. Sex trading behavior in South Africa has been associated with an increased risk of HIV transmission (Dunkle et al., 2005; Dunkle et al., 2004; Ramjee, Karim, & Sturm, 1998). The intersection of methamphetamine use and sex trading is very concerning in the context of South Africa specifically, as it is home to an estimated 6.4 million adults living with HIV/AIDS (Shisana et al., 2014).

This quantitative analysis is part of a larger mixed-methods study conducted with community-recruited methamphetamine users in Cape Town, South Africa. Our qualitative data highlighted sex trading as a normative social phenomenon in this population, which is accompanied by complex gender dynamics and resulting sexual risk (BLINDED FOR REVIEW). To complement the qualitative data, this analysis aimed to identify correlates of sex trading for tik or money in male and female methamphetamine users. The goal of this work is to inform the development of culturally appropriate interventions to prevent the initiation of sex trading and reduce harms associated with ongoing sex trading among stimulant users in low- and middle-income country (LMIC) settings.

METHODS

Setting

The study was conducted in Delft, a peri-urban township of approximately 150,000 residents located 20 miles from the Cape Town city center. Established in 1990, Delft is unique from other townships surrounding Cape Town in that it is mixed race, where 46% of residents identify as Black African and 52% of residents identify as Coloured (City of Cape Town, 2013). These terms originated in the apartheid era as additional means to classify the non-white population. Black describes individuals of African ancestry, while Coloured describes individuals of mixed ancestry, including European, Asian, and southern African. Coloured is an ethnic group that is unique to South Africa, and it is the majority group in the Western Cape. Delft is a primarily low-income community that experiences high rates of unemployment, violent gang activity, and poor educational outcomes (Lehohla, 2012).

Methamphetamine use in Delft is perceived to be highly prevalent and a major social problem (Watt et al., 2013).

Population and Procedures

Data were collected as part of a mixed-methods study of 360 active tik users recruited from the community through respondent driven sampling (RDS) (BLINDED FOR REVIEW). Recruitment began with eight initial respondents called “seeds”. When a seed completed the study visit, they received coupons with a unique tracking ID to recruit up to two peers. Recruits were instructed to arrive at the study office in the Delft South Public Library on weekdays from 10am to 3pm. All participants were compensated with a grocery store voucher of 70 ZAR, equivalent to approximately \$7 USD, for completing the study assessments. To incentivize referrals, each participant was given an additional 20 ZAR (~\$2 USD) for each successful recruit that enrolled with their coupon ID.

To be enrolled in the study, each participant was required to be 18 years old, self-report methamphetamine use in the past week, reside in Delft, and produce a positive urine test for methamphetamine. Individuals were excluded if they demonstrated impaired mental status or acute intoxication. The approximately 2 hour assessment included an audio computer-assisted self-interview (ACASI), followed by a face-to-face interview to assess substance use history and current symptoms of substance use disorder. Both the ACASI and the interview were offered in the language of the participant’s choice (English, Xhosa, or Afrikaans). The interview was administered in a private space by fieldworkers who had received extensive and ongoing training by licensed clinical psychologists. Participants were provided headphones to ensure privacy during the ACASI. Data were collected and managed by full-time field staff, which included 3 fieldworkers and 1 project manager.

Ethics approval was obtained from the Duke Medicine Institutional Review Board and the Stellenbosch University Health Research Ethics Committee.

Measures

Demographics—As part of the ACASI, participants reported their gender, race, education, sexual orientation, housing situation, marital status, and HIV status.

Sex Trading—Sex trading behaviors were assessed with items from the Sexual Experiences and Risk Behavior Assessment Schedule (SERBAS), which has good reliability and validity in both male and female drug users around the world (Dolezal et al., 1999; Ehrhardt et al., 2002; Elkington et al., 2010; Meyer-Bahlburg, Ehrhardt, Exner, & Gruen, 1991; Tross et al., 2008). Participants reported if they had sex in exchange for tik (yes/no) or money (yes/no) in the past 3 months with their main or casual partners. This was followed by another set of questions that assessed the number of people they had sex with in order to get tik or money, the sex of partners, the number of times they had sex in order to get tik or money, condom usage during those occasions (never, occasionally, about half the time, most of the time, all of the time), and physical and sexual assault during these occasions (yes/no). Individuals who indicated trading sex for money specifically were asked what proportion of income they generated from selling sex for money (100%, more than half, less than half), if

they worked for another person with whom they had to share money (yes/no), and if they were ever arrested or detained for selling sex for money (yes/no).

Violence, trauma, and mental health—As part of the ACASI, the 9-item Patient Health Questionnaire (PHQ-9) and Breslau's 7-item questionnaire were used to screen for depression and post-traumatic stress disorder (PTSD), respectively (Kimerling et al., 2006; Kroenke & Spitzer, 2002). Moderate to severe depression was defined as scoring 10 on the PHQ-9, and a total score was calculated by taking a sum. Symptoms were assessed over the past 2 weeks. PTSD symptomatology was defined as endorsing 4 conditions on the Breslau screener, which assessed symptoms in the past month. The short form version of the Child Trauma Questionnaire (CTQ-SF) was employed to assess history of sexual abuse and general neglect or abuse in a participant's childhood (Bernstein et al., 2003). Childhood sexual trauma included being touched or made to touch in a sexual way, being threatened into doing something sexual, and/or being forced to have sex as a child. General childhood neglect or abuse included being hit so hard that it left bruises and/or their parents being too drunk or high to take care of them as a child. The revised Conflict Tactics Scale (CTS2) was administered to measure physical and sexual assault by sex partners (Straus, Hamby, Boney-McCoy, & Sugarman, 1996). Physical assault in the past 3 months was defined as endorsing any of the following questions: "*Has a sex partner threatened to hit or throw something at you?*", "*Has a sex partner hit, kicked, or beat you?*" and "*Has a sex partner used a knife or gun against you?*" Sexual assault in the past 3 months was defined as endorsing any of the following questions: "*Has a sex partner made you have sex without a condom?*", "*Has someone used force (like hitting, holding down, or using a weapon) to make you have sex with them?*", and "*Has someone used threats to make you have sex with them?*"

Addiction Severity Index Lite (ASI-Lite)—The ASI-Lite was administered in the clinical interview to assess both historic and current patterns of drug use in the past 30 days (McLellan et al., 1992). Participants were asked about their use of alcohol to intoxication, tik, marijuana, heroin, prescription painkillers, methaqualone ("Mandrax"), sedatives, cocaine, and inhalants. For each substance, they reported the total number of days they used in the past month, total number of years they used in their lifetime, and typical route of administration.

WHO Composite International Diagnostic Interview (CIDI)—The WHO CIDI for amphetamine use disorders, specific to tik, was administered in the clinical interview (WHO, 1997). As defined in the International Classification of Disease Criteria (ICD), participants were categorized as meeting criteria for amphetamine dependence if they endorsed 3 out of the 6 criteria specific to the past year.

Analysis

SPSS 22 was used to analyze the data. Means and frequencies of sample characteristics were calculated by gender. Frequencies of the descriptors of sex trading were determined and compared between men and women using Pearson's Chi-square test. Univariate logistic regressions were employed to identify factors associated with sex trading in the past 3 months for men and women separately. A multivariate logistic regression model was then

conducted with men and women combined to increase power of the calculations. Demographic factors were first entered as covariates to control for confounding, and variables that were associated with the outcome at $p < 0.05$ in univariate analyses were then entered in a second step. Finally, to explore how gender may moderate sex trading, interaction effects of gender with each predictor variable were entered one-by-one in the regression model (Jaccard, 2001).

RESULTS

Sample characteristics

Table 1 presents characteristics of the full sample by gender. The 360-person sample included 201 (56%) men and 159 (44%) women with a mean age of 29.0 years ($SD=7.30$, range 18–66). The majority (73%) identified as Coloured. The overall socioeconomic status of the sample was low; only 8% were employed full-time, and only 12% had completed secondary school. Few had access to resources like a telephone (57%) or a car (13%), and 33% lived in a shack or backyard dwelling. The self-reported HIV prevalence was 4%. Women were more likely than men to have a history of childhood sexual trauma and identify as Coloured, but there were no other demographic gender differences. The mental health status of the sample was very poor, with high rates of depression, PTSD, and experiences of trauma. A total of 37 men (18%) and 24 women (15%) reported having a same sex partner (MSM or WSW) in the past 3 months.

Descriptors of sex trading

In the past 3 months, 134 participants (37%) reported trading sex in order to receive tik or money. There was no significant difference by gender (40% of men and 33% of women). A majority (81%) of the 37 MSM endorsed sex trading. Among the participants who had engaged in sex trading, 30% traded sex for money only, 26% traded sex for tik only, and 44% traded sex both for money and tik.

Table 2 describes the sex trading experiences of participants who engaged in sex trading in the past 3 months. Trading with multiple partners was common: the median number of trading partners was 3, and 20% of men and 34% of women traded with five or more partners. Only 27% reported consistent condom use when sex trading. Violence in the context of sex trading was common, with 23% reporting physical assault and 27% sexual assault. Women were significantly more likely than men to have been physically assaulted in the context of sex trading.

Among those who traded sex for money, 65% reported that more than half of their income was generated from sex trading. Incomes from sex trading in the past month ranged from 30 ZAR (\$3 USD) to 15000 ZAR (\$1500 USD), with a median of 500 ZAR (\$50 USD). About a quarter (26%) of those who traded sex for money reported being required to share their generated money with a procurer who facilitated the transaction. Harassment from authorities was present among those who traded sex for money, with 18% arrested or detained in the past 3 months for this behavior.

Sex trading behavior was often bidirectional, as 74% of individuals who reported that they traded sex for tik or money also reported that they “bought” sex. Men were significantly more likely than women to buy sex (41% vs. 22%, $\chi^2 = 14.29$, $p < .001$) and to engage in bidirectional sex trading (33% vs. 21%, $\chi^2 = 6.50$, $p < .01$).

Predictors of sex trading

Table 3 presents the logistic regression models predicting sex trading for men and women separately. Among men, identifying as gay/bisexual and identifying as Coloured were associated with greater odds of sex trading. Among women, being single was associated with greater odds of engaging in sex trading. Age, education, and HIV status were unrelated to sex trading for both genders.

Addiction-related predictors were similar across genders. Both men and women who sold sex were significantly more likely to meet the criteria for ICD-10 amphetamine dependence (OR=5.39, 95% CI=1.86–15.60). Years of regular methamphetamine use and concurrent heroin use were significantly correlated with sex trading in men. Marijuana, methaqualone, and heavy alcohol use were not significantly correlated with sex trading.

While men who experienced physical assault and sexual assault in the past 3 months had greater odds of trading sex, women were affected by extensive histories of violence at a much higher proportion than men. Women had greater odds of trading sex if they reported a childhood history of sexual abuse, reported being a victim of sexual assault in the past 3 months, or met the screening criteria for PTSD. Women with higher depression scores also had greater odds of sex trading.

Table 4 depicts the multivariate analysis predicting sex trading in the past 3 months. In the multivariate model, participants who were male, gay/bisexual, and unmarried were more likely to trade sex. Those who endorsed sex trading were more likely to meet the criteria of amphetamine dependence; however, years of methamphetamine use was no longer significant. Individuals who also used heroin were more likely to engage in sex trading. With respect to violence and mental health in the sample, experiencing recent sexual assault and a history of childhood sexual trauma were significantly correlated with sex trading.

Gender interactions

Each variable in table 3 was run in an additional set of logistic regression models predicting sex trading with a gender by variable interaction term added as an extra step. There was a gender by childhood sexual trauma interaction (Wald=5.53, $p=0.019$) in which childhood sexual trauma was associated with sex trading for women but not men, and a gender by race interaction (Wald=7.74, $p=0.005$) in which identifying as Coloured was associated with sex trading in men but not women. No other gender interactions were statistically significant for these predictor variables.

DISCUSSION

This study examined sex trading and its correlates in a relatively large sample of community-recruited methamphetamine users in Cape Town, South Africa. Sex trading for

tik or money in the past 3 months was common (37%), with nearly half of these individuals reporting that they had traded sex both for tik and for money in this time period. While a similar proportion of men and women reported trading sex, our previously reported qualitative data suggests that these experiences may be different, with women being more deliberate in using sex as a commodity to obtain methamphetamine, and men trading sex on a more opportunistic basis, often in ongoing relationships (BLINDED FOR REVIEW). For both men and women, high-risk sexual behaviors were observed, including multiple trading partners and unprotected intercourse during sex trading, placing these tik users at high risk for HIV infection and transmission. A diagnosis of methamphetamine dependence increased the odds of sex trading by over 5, and this was a significant predictor in both men and women, suggesting that addiction is a strong driver of sex trading behavior.

More severe methamphetamine addiction was strongly associated with sex trading among both men and women. This is consistent with other research, suggesting that heavier drug use may be a motivator of sex trading (J. M. Edwards et al., 2006; Ouellet et al., 1993). It is also compatible with the sentiments expressed in our qualitative data from a subset of the participants in this sample (BLINDED FOR REVIEW). In-depth interviews highlighted how sex trading was motivated by desperation to obtain drugs, especially among women. Although substance use treatment was available for free in the study community (K. Johnson et al., 2014), the majority had never sought treatment, highlighting the need for more concerted efforts to link tik users to substance abuse treatment. Previous research found that substance abuse treatment is associated with decreased transactional sex (Metzger, Woody, & O'Brien, 2010; Sorensen & Copeland, 2000), which suggests targeted interventions that link this population to evidence-based addiction care could reduce sex trading.

It is further concerning that concurrent heroin use was associated with trading sex, given that there is evidence of rising heroin consumption in the Western Cape (K. Johnson et al., 2014; Pluddemann, Parry, Flisher, & Jordaan, 2008). Research on the current trends and practices of heroin use in South Africa is limited, but one study noted that heroin is used by commercial sex workers as a way to reduce anxiety and tensions related to the stress of their work (Floyd et al., 2010). As heroin is highly addictive with severe withdrawal symptoms (Anthony, Warner, & Kessler, 1994), an increased desperation among heroin users for a “fix” may drive individuals to pursue and continue sex trading. If the trend of rising heroin consumption continues, it could further exacerbate sex trading and its associated risks. Consequently, drug policies and treatment centers that have prioritized methamphetamine treatment must also consider action to address a rise in heroin use among methamphetamine users. This includes treatment for opioid dependence, such as affordable opioid substitution therapy for detoxification and longer-term abstinence programs.

The high rates of unprotected sex acts among those trading sex may contribute to the spread of HIV and other sexually transmitted infections in the community. Although the self-reported HIV prevalence in the sample was fairly low, this is likely an underestimate due to the self-report. Interventions are needed to encourage safer sex practices. Challenges to condom utilization include impaired memory from drug use, misinformation about condoms, and limited negotiating power in the context of sex trading, particularly among women (Beksinska, Smit, & Mantell, 2012; Watt, Kimani, Skinner, & Meade, 2015; Watt et

al., 2013). In vulnerable groups, peer education interventions have been effective in increasing condom use in those who trade sex in LMIC settings (Basu et al., 2004; Ford, Wirawan, Suastina, Reed, & Muliawan, 2000; Morisky, Stein, Chiao, Ksobiech, & Malow, 2006), as well as in populations of active methamphetamine users (Sherman et al., 2009). Given the success of the recruitment method in this study (BLINDED FOR REVIEW), chain referral may be a suitable strategy to reach people for a targeted intervention in the community.

The low socioeconomic status of the community, including high levels of unemployment, inadequate housing, and poor education outcomes, likely further exacerbates the need to engage in sex trading to procure drugs. This setting may contribute to the unique complexity of the bidirectional nature of sex trading, where both buying and selling sex for tik or money were simultaneously endorsed by many participants. In this poor, unstable socioeconomic context, there is likely fluctuation in who has tik or the resources to obtain it. The same individuals may at times be seeking tik, and at other times have met their “fix” and be seeking a sexual partner, perhaps fueled by the hypersexuality-invoking characteristics of methamphetamine. In addition, the high prevalence of bidirectional sex trading suggests that this behavior was likely not occurring in the context of formal sex work. Although we did not explicitly assess whether or not participants identified as commercial sex workers, only a small proportion reported generating more than 50% of their income from sex trading. Therefore, the HIV prevention needs of this population of active tik users may be different from those of commercial sex workers. Cash transfer programs have been associated with a decrease in unprotected sex and transactional sex in South African communities (Cluver et al., 2013). This type of intervention could curb the socioeconomic constraints that drive an individual to sex trading in a context of poverty.

Contrary to the international literature, in this sample of active tik users, we found that men were equally likely to trade sex for tik or money. Although the majority of men who exchanged sex did so with other women, the majority of MSM in the sample traded sex. This is consistent with the literature where sex trading amongst MSM has been observed in Sub-Saharan African contexts (Baral et al., 2011; Baral et al., 2009; Lane et al., 2011). However, sex exchange practices of MSM were notably unreported in our previous qualitative analysis (BLINDED FOR REVIEW). It is possible that our qualitative sample did not include MSM, or that participants were reluctant to talk about this subject due to stigma. In other research, sex trading in South Africa has been observed to be a tool for MSM to meet basic material needs as well as initiate same sex relationships (Masvawure, Sandfort, Reddy, Collier, & Lane, 2015), and drug use has been observed among MSM to facilitate sexual encounters while increasing sexual pleasure (Parry et al., 2008). There is, however, a notable lack of research investigating the interpersonal experiences and sexual culture of MSM in South Africa. More studies are needed to understand the factors, motivations, and dynamics of sex trading in this group. In Sub-Saharan Africa, MSM still face significant stigma (Lane, Shade, McIntyre, & Morin, 2008; Tucker, de Swardt, Struthers, & McIntyre, 2013), which can impact utilization of health care services (Rispel, Metcalf, Cloete, Moorman, & Reddy, 2011) and correlates with high-risk sexual practices (Arnold, Struthers, McIntyre, & Lane, 2013; Tucker et al., 2014). Interventions aimed at reducing sex trading and its associated HIV risk in methamphetamine users must be

cognizant of the needs of MSM. It is still unclear how race may influence behavior, as Coloured men were more likely to endorse sex trading. While studies have explored sex and drug behavior between black and Coloured women (Myers et al., 2013; Wechsberg et al., 2008), further exploration is needed into ethnic differences in drug use patterns among South African men.

Women in this community still face unique vulnerabilities, which may be exacerbated in the context of substance use. Given gender dynamics in South Africa, men have much more power in transactional sex exchanges between men and women. Women reported higher levels of violence in the form of physical and sexual assault while actively engaging in sex trading or meeting with a partner to do so. These experiences of violence are consistent with the content of our qualitative findings (BLINDED FOR REVIEW), and other studies with women in South Africa (Sawyer, Wechsberg, & Myers, 2006; Wechsberg, Luseno, & Lam, 2005). Interventions that address the unique circumstances of how women are viewed by men within the context of a gender hierarchy may be needed to empower women to negotiate and respond in these hostile situations. Empowerment interventions with South African female sex workers and other at-risk women have been successful, resulting in decreases in inter-personal violence and increases in condom use (Wechsberg, Luseno, Kline, Browne, & Zule, 2010; Wechsberg, Luseno, Lam, Parry, & Morojele, 2006).

The correlates in this study suggest that violence and its psychological impact may contribute to sex trading in this sample of women. The high prevalence of childhood sexual trauma and PTSD symptoms amongst women who traded sex suggests psychological interventions that address the impact of such experiences may be protective against sex trading. PTSD treatments that take a holistic, integrative approach have seen success in South Africa (D. J. A. Edwards, 2009). Integrating PTSD treatments into addiction rehabilitation and clinical care may be an effective means through which to offer services. A women-focused HIV and violence prevention program also had the effect of reducing the symptoms of PTSD among incarcerated women who had experienced violence (J. E. Johnson et al., 2014). Addressing these issues earlier could thwart the initiation of sex trading. Early interventions for children who experience trauma has successfully been used in South Africa, and may offer therapeutic healing that prevents future substance use and sex trading behaviors (Leibowitz-Levy, 2005).

A noteworthy strength of this study is that it is the largest sample of methamphetamine users recruited from the community in South Africa. The use of RDS enabled us to reach a broad sampling of heavy methamphetamine users. Demographics appeared representative of the community, and the effectiveness of RDS in this study was examined in a separate analysis (BLINDED FOR REVIEW). This is one of the first quantitative studies to identify correlates of sex trading among active drug users within a LMIC context. However, the cross-sectional design of the study limits the scope to one specific point of time. As such, causation cannot be inferred. Additionally, onsite rapid HIV testing was unavailable to estimate HIV seroprevalence in the sample. Since the sample was from one peri-urban township using a chain referral strategy, results may not generalize to other communities in South Africa or other regions of the world. However, this township is reflective of the diversity and

socioeconomic context observed within multiple communities in South Africa and Sub-Saharan Africa as a whole.

This study addresses a gap in the literature by examining sex trading behavior amongst active methamphetamine users in a LMIC setting. In the context of a persistent HIV epidemic, the high prevalence of sex trading and its associated HIV risks points to a tremendous need for interventions targeting this population. Interventions will need a nuanced, integrated approach in which consideration is given to the many complex issues at play, including addiction, poverty, gender, race, sexuality, violence, and HIV risk. A preventative approach that addresses these identified correlates may curb the initiation of sex trading amongst active methamphetamine users. These targeted interventions can also reduce current sex trading and the harmful behaviors associated with its practice.

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Table 1

Sample characteristics (n=360)

	Males n=201	Females n=159	Statistic
Age, M (SD)	28.92 (7.59)	29.04 (6.95)	t (360)=1.51
Race, n (%) Coloured	125 (62%)	138 (87%)	$\chi(1)^2 = 27.30^{***}$
Gay/lesbian or bisexual, n (%)	22 (11%)	22 (14%)	$\chi(1)^2 = 0.69$
HIV, n (%) positive	8 (4%)	9 (6%)	$\chi(1)^2 = 0.56$
Education, n (%) completed grade 12	22 (11%)	20 (13%)	$\chi(1)^2 = 0.23$
Formal full time employment, n (%)	16 (8%)	13 (8%)	$\chi(1)^2 = 0.01$
Married, n (%)	21 (11%)	23 (15%)	$\chi(1)^2 = 1.33$
Injection drug use in past 3 months, n (%)	3 (2%)	4 (3%)	$\chi(1)^2 = 0.49$
Housing, n (%) in shack or backyard dwelling	72 (36%)	45 (28%)	$\chi(1)^2 = 2.29$
Owens telephone or mobile phone, n (%)	113 (57%)	91 (57%)	$\chi(1)^2 = 0.02$
Access to car, n (%)	24 (12%)	22 (14%)	$\chi(1)^2 = 0.27$
Moderate to severe depression, n (%)	97 (48%)	80 (50%)	$\chi(1)^2 = 0.15$
Any childhood trauma, n (%)	48 (24%)	68 (43%)	$\chi(1)^2 = 14.50^{***}$
Post-traumatic stress disorder, n (%)	107 (53%)	87 (55%)	$\chi(1)^2 = 0.08$
Ever sought treatment to tik, n (%)	21 (11%)	16 (10%)	$\chi(1)^2 = 0.02$
Traded sex for tik/money past 3 months, n (%)	81 (40%)	53 (33%)	$\chi(1)^2 = 1.84$

P<05*; P<.01**; P<.001**

Table 2

Descriptores of participants who traded sex for tik and/or money in past 3 months (n=134)

	Males n=81	Females n=53	Statistic
Traded with 5 or more sex partners, n (%)	16 (20%)	18 (34%)	$\chi(1)^2 = 3.42$
Same sex partner, n (%)	30 (37%)	14 (26%)	$\chi(1)^2 = 1.64$
Frequency of trading vaginal/anal sex, n (%) 5 times	19 (32%)	15 (40%)	$\chi(1)^2 = 0.63$
Inconsistent condom use during vaginal/anal sex, n (%)	59 (73%)	39 (74%)	$\chi(1)^2 = 0.01$
Frequency of trading oral sex, n (%) 5 times	8 (14%)	7 (18%)	$\chi(1)^2 = 0.42$
Physical assault when sex trading, n (%)	13 (16%)	18 (34%)	$\chi(1)^2 = 5.78^*$
Sexual assault when sex trading, n (%)	10 (12%)	13 (24%)	$\chi(1)^2 = 3.34$
Among participants who sold sex for money (n=74) ^I			
>50% of income generated from sex trading, n (%)	23 (55%)	25 (78%)	$\chi(1)^2 = 4.35^*$
Had to share money with procurer, n (%)	9 (21%)	10 (31%)	$\chi(1)^2 = 0.92$
Arrested/detained when selling sex for money, n (%)	6 (14%)	7 (22%)	$\chi(1)^2 = 0.72$

P<05*; P<.01**; P<.001***

^I Restricted to participants who sold sex for money and answered these items

Table 3

Correlates of trading sex for tik or money in past 3 months (n=360)

	Male (n=201)			Female (n=159)		
	Traded sex n=81 (40%)	Did not trade n=120 (60%)	Odds Ratio	Traded sex n=53 (33%)	Did not trade n=106 (67%)	Odds Ratio
<u>Demographics</u>						
Sexual orientation, n (%) gay/lesbian/bisexual	14 (17%)	8 (7%)	2.93 (1.17–7.34)*	10 (20%)	12 (11%)	1.82 (0.73–4.54)
Race, n (%) “Coloured”	60 (74%)	55 (46%)	2.42 (1.31–4.46)**	43 (81%)	95 (90%)	0.50 (0.20–1.26)
Age, M (SD)	29.8 (8.00)	28.4 (7.28)	1.02 (0.99–1.06)	27.9 (6.51)	29.6 (7.12)	0.96 (0.92–1.01)
Married, n (%)	7 (9%)	14 (11%)	0.72 (0.28–1.86)	3 (6%)	20 (19%)	0.26 (0.07–0.91)*
Education, n (%) completed grade 12	11 (14%)	11 (9%)	1.56 (0.64–3.79)	6 (11%)	14 (13%)	0.84 (0.30–2.32)
HIV, n (%) positive	4 (5%)	4 (3%)	1.51 (0.37–6.21)	2 (4%)	7 (7%)	0.55 (0.11–2.78)
<u>Severity of methamphetamine use</u>						
Daily “tik” use, n (%)	55 (68%)	73 (61%)	1.36 (0.75–2.47)	32 (60%)	55 (52%)	1.41 (0.72–2.76)
ICD amphetamine dependence, n (%)	78 (96%)	102 (85%)	4.59 (1.31–16.13)*	52 (98%)	91 (87%)	8.00 (1.02–62.59)*
Years of use, M (SD)	7.83 (4.00)	6.69 (4.01)	1.07 (1.00–1.15)*	7.47 (3.15)	6.69 (3.03)	1.09 (0.98–1.21)
<u>Concurrent drug use in past 30 days</u>						
Heavy alcohol use, n (%)	30 (37%)	55 (46%)	0.70 (0.39–1.24)	17 (32%)	32 (30%)	1.09 (0.54–2.22)
Any marijuana (“dagga”), n (%)	70 (86%)	106 (88%)	0.84 (0.36–1.96)	38 (72%)	64 (60%)	1.66 (0.82–3.39)
Any methaqualone (“mandrax”), n (%)	60 (74%)	86 (72%)	1.13 (0.60–2.13)	32 (64%)	53 (50%)	1.52 (0.78–2.98)
Any heroin (“unga”), n (%)	14 (17%)	9 (8%)	2.58 (1.06–6.28)*	7 (13%)	7 (7%)	2.15 (0.71–6.50)
<u>Violence and mental health</u>						
Victim of physical assault past 3 months, n (%)	33 (41%)	30 (25%)	2.06 (1.13–3.78)*	29 (55%)	46 (43%)	1.58 (0.81–3.06)
Victim of sexual assault past 3 months, n (%)	29 (36%)	24 (20%)	2.23 (1.18–4.22)*	24 (45%)	17 (16%)	4.33 (2.05–9.17)***
Childhood sex trauma, n (%)	21 (26%)	27 (23%)	1.21 (0.63–2.32)	34 (64%)	34 (32%)	3.79 (1.89–7.59)***
Childhood abuse/neglect, n (%)	37 (46%)	47 (39%)	1.30 (0.74–2.31)	26 (49%)	36 (34%)	1.87 (0.96–3.67)
PTSD, n (%)	48 (59%)	59 (49%)	1.50 (0.85–2.66)	38 (72%)	49 (46%)	2.95 (1.45–5.99)**
PHQ-9 Total Score, M (SD)	9.93 (6.47)	10.13 (7.00)	1.00 (0.96–1.04)	12.30 (8.01)	9.58 (8.03)	1.04 (1.00–1.09)*

P<.05*, P<.01**, P<.001***

Table 4

Multivariate analysis of trading sex for tik or money in past 3 months (n=360)

	Traded sex n=134 (37%)	Did not trade n=226 (63%)	Odds Ratio	Adjusted Odds Ratio
<u>Demographics</u>				
Gender, Male n (%)	81 (60%)	120 (53%)	1.35 (0.87–2.08)	1.72 (1.02–2.87)*
Sexual orientation, n (%) gay/lesbian/bisexual	24 (18%)	20 (9%)	2.25 (1.19–4.25)*	2.42 (1.19–4.93)*
Race, n (%) “Coloured”	103 (77%)	160 (71%)	1.38 (0.84–2.25)	1.41 (0.74–2.68)
Age, M (SD)	29.03 (7.47)	28.94 (7.22)	1.00 (0.97–1.03)	1.01 (0.98–1.05)
Married, n (%)	10 (8%)	34 (15%)	0.46 (0.22–0.96)*	0.44 (0.19–0.99)*
Education, n (%) completed grade 12	17 (13%)	25 (11%)	1.17 (0.61–2.25)	1.09 (0.52–2.27)
HIV, n (%) positive	6 (5%)	11 (5%)	0.92 (0.33–2.54)	0.95 (0.29–3.07)
<u>Severity of methamphetamine use</u>				
Daily “tik” use, n (%)	87 (65%)	128 (57%)	1.42 (0.91–2.20)	
ICD amphetamine dependence, n (%)	130 (97%)	193 (86%)	5.39 (1.86–15.60)**	3.30 (1.06–10.26)*
Years of use, M (SD)	7.69 (3.68)	6.69 (3.58)	1.08 (1.02–1.15)*	1.07 (1.00–1.15)
<u>Concurrent drug use in past 30 days</u>				
Heavy alcohol use, n (%)	47 (35%)	87 (39%)	0.86 (0.55–1.35)	
Any marijuana (“dagga”), n (%)	108 (81%)	170 (75%)	1.37 (0.81–2.3)	
Any methaqualone (“mandrax”), n (%)	92 (69%)	139 (62%)	1.37 (0.87–2.16)	
Any heroin (“unga”), n (%)	21 (16%)	16 (7%)	2.44 (1.22–4.86)*	2.15 (1.00–4.67)*
<u>Violence and mental health</u>				
Victim of physical assault past 3 months, n (%)	62 (46%)	76 (34%)	1.70 (1.60–2.63)*	1.07 (0.64–1.82)
Victim of sexual assault past 3 months, n (%)	53 (40%)	41 (18%)	2.95 (1.82–4.79)***	2.69 (1.50–4.46)**
Childhood sex trauma, n (%)	55 (41%)	61 (27%)	1.88 (1.20–2.96)**	1.87 (1.08–3.35)*
Childhood abuse/neglect, n (%)	63 (47%)	83 (37%)	1.53 (0.99–2.36)	
PTSD, n (%)	86 (64%)	108 (48%)	1.96 (1.26–3.04)**	1.41 (0.85–2.35)
PHQ-9 Total Score, M (SD)	10.87 (7.19)	9.88 (7.49)	1.02 (0.99–1.05)	

P<0.05*, P<0.01**, P<0.001***