Descriptors and Correlates of Sex Trading Amongst Active Methamphetamine Users in Cape Town, South Africa

by

Ryan Lion

Duke Global Health Institute
Duke University

Date:_______________________

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Christina Meade, Supervisor

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Wendee Wechsberg

Thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in the Duke Global Health Institute in the Graduate School of Duke University

2015
ABSTRACT

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Introduction: South Africa has witnessed a tremendous rise in methamphetamine consumption since the year 2000. Sex trading is a phenomenon that has been observed in active drug users, globally and within South Africa, and has been associated with risks for HIV infection and violence. This paper is a secondary analysis examining sex trading among active methamphetamine users in Cape Town, South Africa. Methods: Respondent driven sampling was used to recruit 360 active methamphetamine users in a peri-urban township in Cape Town. A structured clinical interview and computerized survey were used to assess history of sex trading, demographics, drug use, sexual risk behaviors, history of violence, and mental health. Logistic regression models were used to examine predictors of sex trading, separately for men and women. Results: In a total sample of 201 men and 159 women, 40% of men and 33% of women endorsed trading sex for tik or money in the past 3 months. Those who traded sex were more likely to meet the criteria for ICD-10 amphetamine dependence among both men (OR=4.59, 95% CI=1.31-16.13) and women (OR=8.00, 95% CI: 1.02-62.59). Men who were concurrent heroin users were also more likely to exchange sex (OR=2.58, 95% CI: 1.06-6.28). Sexual risk behaviors were significantly associated with sex trading. Notably, unprotected sex with a casual partner was correlated with sex trading in men (OR=3.57, 95% CI:1.66-7.69) and women (OR=3.68, 95% CI:1.63-8.29). Among women, those who experienced
childhood sexual trauma (OR=3.79, 95% CI: 1.89-7.59) and had the symptoms of post-traumatic stress disorder (OR=2.95, 95% CI: 1.45-5.99) were also more likely to trade sex.

**Discussion:** This study offers insight into the interventions needed for this high-risk population in a LMIC (low and/or middle income countries) context. The results stress a need for linkage to drug treatment, as addiction may be fueling sex trading. The risky sexual practices illustrate how targeted interventions geared toward safe sex practices may help this population. More research is needed to explore the experiences of men who have sex with men given their particularly high rates of sex trading behavior. In a context of high rates of trauma and violence, women need interventions that are attuned to their particular vulnerabilities and offer empowerment through counseling.
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Acknowledgements

This study was funded by grants R03-DA033282 and K23-DA028660 from the United States National Institutes of Health (NIH). I am grateful for my mentor Dr. Christina Meade for her academic guidance throughout the course of this thesis and my work in her lab since I came to Duke. Dr. Melissa Watt also offered much support and counsel through this project. I am grateful that Dr. Wendee Wechsberg shared her time and expertise as a serving member on my committee. The Duke Global Health Institute and its staff offered travel funding and much appreciated guidance through this process. I thank both the Duke and South African team members of the Delft Connections project who collected and managed the data. Lastly, I would like to thank all participants in this study for whom I hope this research can be used to improve their health and wellbeing.
1. Introduction

With the fall of apartheid in South Africa and reconnection to the international market, methamphetamine use emerged in Cape Town and the surrounding areas in the Western Cape Province. Colloquially referred to as “tik,” this white, crystalline psychostimulant is generally smoked through makeshift pipes. Reflecting the increasing burden of methamphetamine in the Western Cape, of those seeking treatment, the percent reporting tik as their primary drug of abuse has risen from 0.1% in the year 2001 to 33% in the year 2013 (K. Johnson et al., 2014). Further, in a street intercept survey from a racially mixed township, 18% of men and 12% of women reported ever using tik (Simbayi et al., 2006). In a recent survey in alcohol serving venues in one of Cape Town’s peri-urban townships, 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 how its consumption may be fueling hypersexuality and subsequent HIV risk.

Sex trading is a global phenomenon that refers to any sort of transactional exchange of sexual activity in return for money or goods (Weitzer, 2000). In the international literature, trading of sex is generally more common among women (Baral et al., 2012; Bobashev, Zule, Osilla, Kline, & Wechsberg, 2009; Latkin, Hua, & Forman, 2003). Sex trading increases transmission of HIV and other STDs in both low and high income countries (Baral et al., 2012; Shannon et al., 2015). Among formal sex workers,
this is exacerbated by stigmatization that leads to decreased utilization of health care services (King, Maman, Bowling, Moracco, & Dudina, 2013; Oldenburg et al., 2014). Those who engage in sex trading are also more vulnerable 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). Indicators for psychological and mental health conditions including depression, anxiety, and loneliness have also been observed amongst those selling sex (Golder & Logan, 2007; Risser, Timpson, McCurdy, Ross, & Williams, 2006). Sex trading is observed in low-income contexts, including communities in sub-Saharan Africa, often resulting from socioeconomic pressures and constraints on resources (Gysels, Pool, & Nnalusiba, 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 addiction withdrawals (Ouellet, Wiebel, Jimenez, & Johnson, 1993), as well as socioeconomic 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, there is a dearth of research examining the quantitative correlates of transactional sex. In a large multisite sample of 4667 women crack-cocaine users in the United States, 57% reported
exchanging sex for cocaine or money (Logan & Leukefeld, 2000). This was similar to a sample of 669 women crack-cocaine users, where 44.1% exchanged sex for cocaine or money in a 30 day period (J. M. Edwards, Halpern, & Wechsberg, 2006). These studies found that heavier drug use, homelessness, unemployment, child abuse, and STDs were strongly associated with the act of trading sex.

Globally, methamphetamine consumption specifically 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). Similar patterns have been observed among tik users in South Africa (Pluddemann, Flisher, Mathews, Carney, & Lombard, 2008; Wechsberg, Jones, et al., 2010). It has been suggested that methamphetamine dependence may act as a coercive force that compels people to sell sex (Tyler, Whitbeck, Chen, & Johnson, 2007). In the United States, a study of methamphetamine using men who have sex with men (MSM) found that 43% of the sample traded sex for methamphetamine in the past 3 months (Semple, Strathdee, Zians, & Patterson, 2010). The study found that this transactional sex was associated with homelessness, riskier sex practices, and having a low income. Most research on sex trading amongst methamphetamine users has been in the United States and Canada, yet it also occurs in other regions and LMICs (Low and/or middle income countries), including Mexico, Thailand, the Philippines, and South Africa (Brouwer et al., 2006; Melbye et al., 2002; Urada et al., 2014; Watt et al., 2013).
In South Africa, sex trading has been highly associated with an increased risk of HIV transmission (Dunkle et al., 2005; Dunkle et al., 2004; Ramjee, Karim, & Sturm, 1998). Sex trading in South Africa for goods or cash is often not considered a form of prostitution or commercial sex work by parties involved, further illustrating how transactional sex is a complex sociocultural phenomenon in this context (C. E. Kaufman & Stavrou, 2004). Amongst South Africa’s methamphetamine users, sex trading has been observed at high frequencies. In a study conducted at alcohol serving establishments within one of Cape Town’s townships, 17% of male and 32% of female methamphetamine users reported selling sex for methamphetamine or money, which was significantly higher than non-methamphetamine users in those venues (Meade et al., 2012). However, a gap in the research exists on factors associated with sex trading in this vulnerable population. Sex trading among South African methamphetamine users has been explored in one a qualitative analysis (Watt, Kimani, Skinner, & Meade, 2015). This study found that women, often driven by addiction, may use sex as a commodity to obtain methamphetamine, while men traded sex when opportunities emerged to obtain the drug, often in ongoing relationships. It points to how sex trading is a normative social phenomenon in this population that is accompanied by complex gender dynamics as well as sexual risk. Both methamphetamine use and sex trading is very concerning in the context of South Africa specifically, as it houses an estimated 6.4 million living with HIV/AIDS, more than anywhere else in the world (Shisana et al., 2014).
The objective of this secondary analysis is to identify the correlates of trading sex for tik or money among active methamphetamine users in Cape Town, South Africa. This is important as sex trading may be fueling the continued spread of STDs and harm within the community of tik users. The study has the potential to inform the development of culturally appropriate interventions for risky sexual practices and measures that may prevent the initiation of sex trading in drug using communities within LMIC settings.
2. Methods

2.1 Setting

The study was conducted in Delft, a township of approximately 150,000 located 20 miles from the Cape Town city center. Delft was established in 1990, and is unique from other townships surrounding Cape Town in that it is racially diverse, with a composition that is 46% Black African and 52% Coloured, terms that originated in the apartheid era that are used to describe people of African or mixed ancestry, respectively (City of Cape Town, 2013). This is a primarily low-income community that experiences high rates of poverty, unemployment, violent gang activity, and poor education outcomes (Lehohla, 2012).

2.2 Participants and procedures

Data was collected from a community sample of 360 active tik users recruited through respondent driven sampling. This chain-referral strategy utilizing coupons as an incentive is described in detail elsewhere (Kimani et al., 2014). Recruitment began with eight initial respondents called “seeds”. When a seed completed the study visit, he or she received a coupon to recruit two peers. Each coupon was given a unique tracking ID. All participants were initially compensated with a grocery store voucher of 70 ZAR, equivalent to approximately $7 USD and were instructed to refer peers. To incentivize referral, each participant was given an additional 20 ZAR (~$2 USD) for each of the recruited individual 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) and an extensive clinical interview administered by a staff member. Both the clinical interview and ACASI were offered in the language of the participant’s choice (English, Xhosa, or Afrikaans).

2.3 Measures

2.3.1 Demographics

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

2.3.2 Sexual risk behaviors

A modified version of the Sexual Risk Behavior Assessment Schedule (SERBAS) was used to ask participants to report sexual behaviors over a 3-month period (Meyer-Bahlberg, Ehrhardt, Exner, & Gruen, 1990). The sexual risk behavior questionnaire in the ACASI assessed the number and type of sexual partners (main or casual), frequency of types of sexual acts (vaginal, anal, or oral), the number of times condoms were used in acts of vaginal or anal sex, and sex while high on tik or other drugs (never, occasionally, about half the time, most of the time, all of the time).
2.3.3 Sex trading

Participants were asked to report in the ACASI if they had sex in exchange for tik (yes/no) or money (yes/no) in the past 3 months. These were followed by questions assessing the number of people they had sex with in order to get tik or money, 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).

2.3.4 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 a sum of 10 or greater on the PHQ-9 total. PTSD responses were summed and dichotomized as endorsing four or more symptoms. A 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, threatened unless they did something sexual, and/or 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 where 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?”.

### 2.3.5 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 (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. They reported the total number of days they used each substance in the past month, total number of years they used each substance regularly in their lifetime, and typical route of administration. The
ASI-Lite also assessed the subject’s medical, employment, legal, social and psychiatric history.

### 2.3.6 WHO Composite International Diagnostic Interview (CIDI)

The WHO CIDI for methamphetamine substance abuse disorders was administered in the clinical interview (WHO, 1997). As defined in the International Classification of Disease Criteria (ICD), it measures for amphetamine dependence. Participants were categorized as meeting criteria for amphetamine dependence if they endorsed 3 out of the 6 criteria. ICD harmfulness was also identified by endorsing (yes/no) the following item: “Did you continue to use tik when you knew you had a serious physical or emotional health problem that might have been caused or made worse by using tik? (e.g. rotting teeth, paranoia).”

### 2.3.7 Severity of Dependence Scale (SDS)

The 5-item SDS scale was used in the clinical interview to measure severity of amphetamine dependence specific to tik (Gossop et al., 1995). The first four questions were “How often was your use of tik out of control?”, “How often did the thought of missing a fix of tik make you anxious or worried?”, “How often did you worry about your use of tik?”, and “Did you wish you could stop?” (3=always; 2=often; 1=sometimes; 0=Never). The last question was “How difficult did you find it to stop or go without tik?” (3=impossible; 2=very difficult; 1=quit difficult; not difficult). The total score was calculated by summing the responses for each question.
2.4 Analysis

Data was entered into SPSS 22 for quantitative analysis. Means and frequencies of sample characteristics were calculated by race and 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. This was done for men and women separately. Interaction effects were then examined with gender and the predictor variables in the total sample to explore how gender may moderate sex trading (Jaccard, 2001).
3. Results

3.1 Sample characteristics

Table 1 presents characteristics of the total sample by gender and race. The 360-person sample was composed of 201 (56%) men and 159 (44%) women with a mean age of 29.0 (SD=7.30) and ranged from 18 to 66. The participants were racially diverse, with 73% identifying as Coloured and 27% as Black African. The overall socioeconomic status of the sample was low; only 19% were employed either full or part time, and only 12% had completed secondary school. Based on self-report, 4% reported being HIV positive; however, 20% had never been HIV tested. Women were more likely than men to have a history of childhood sexual trauma and identify as Coloured, while there were no other gender differences.

Table 1: Sample characteristics

<table>
<thead>
<tr>
<th></th>
<th>Male (N=201)</th>
<th>Female (N=159)</th>
<th>Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coloured</td>
<td>Black</td>
<td>Coloured</td>
</tr>
<tr>
<td></td>
<td>N=135 (67%)</td>
<td>N=76 (38%)</td>
<td>N=138 (87%)</td>
</tr>
<tr>
<td>Age, M (SD)</td>
<td>31.25</td>
<td>25.09</td>
<td>29.59</td>
</tr>
<tr>
<td>Gay or lesbian, %</td>
<td>14 (11%)</td>
<td>17 (12%)</td>
<td>22 (14%)</td>
</tr>
<tr>
<td></td>
<td>(7.77)</td>
<td>(5.47)</td>
<td>(7.59)</td>
</tr>
<tr>
<td>HIV, % positive</td>
<td>14 (11%)</td>
<td>18 (13%)</td>
<td>22 (14%)</td>
</tr>
<tr>
<td></td>
<td>(5.7)</td>
<td>(3.4)</td>
<td>(4.4)</td>
</tr>
<tr>
<td>Education, % completed grade 12</td>
<td>17 (14%)</td>
<td>21 (15%)</td>
<td>21 (15%)</td>
</tr>
<tr>
<td></td>
<td>(5.6)</td>
<td>(2.2)</td>
<td>(2.2)</td>
</tr>
<tr>
<td>Married, %</td>
<td>17 (14%)</td>
<td>21 (15%)</td>
<td>21 (15%)</td>
</tr>
<tr>
<td></td>
<td>(5.6)</td>
<td>(2.2)</td>
<td>(2.2)</td>
</tr>
<tr>
<td>Injection drug use past 3 months, %</td>
<td>64 (51%)</td>
<td>97 (48%)</td>
<td>70 (51%)</td>
</tr>
<tr>
<td>Moderate to severe depression, %</td>
<td>18 (14%)</td>
<td>48 (24%)</td>
<td>59 (42%)</td>
</tr>
<tr>
<td>Childhood sex trauma, %</td>
<td>66 (53%)</td>
<td>107 (53%)</td>
<td>77 (56%)</td>
</tr>
<tr>
<td>Post-traumatic stress disorder, %</td>
<td>60 (48%)</td>
<td>81 (40%)</td>
<td>43 (31%)</td>
</tr>
<tr>
<td>Traded sex for tik or money past 3 months, %</td>
<td>60 (48%)</td>
<td>81 (40%)</td>
<td>43 (31%)</td>
</tr>
</tbody>
</table>

P<0.05; *P<0.01; **P<0.001
3.2 Descriptors of sex trading

A total of 134 participants (37%) reported trading sex for tik or money in the past 3 months. 40% of men and 33% of women traded sex, with no significant difference by gender. Of these individuals, 55% reported selling sex for money and 52% reported trading sex in exchange for tik. Table 2 describes the sex trading experiences of those who had engaged in this behavior in the past 3 months.

Table 2: Descriptors of those trading sex in past 3 months

<table>
<thead>
<tr>
<th></th>
<th>Males</th>
<th>Females</th>
<th>Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sold to 4 or more sex partners, %</td>
<td>22 (27%)</td>
<td>22 (42%)</td>
<td>$\chi^2(1) = 2.99$</td>
</tr>
<tr>
<td>Consistent condom use, %</td>
<td>22 (27%)</td>
<td>14 (26%)</td>
<td>$\chi^2(1) = 0.01$</td>
</tr>
<tr>
<td>Physical assault when sex trading, %</td>
<td>13 (16%)</td>
<td>18 (34%)</td>
<td>$\chi^2(1) = 5.78^*$</td>
</tr>
<tr>
<td>Sexual assault when sex trading, %</td>
<td>10 (12%)</td>
<td>13 (24%)</td>
<td>$\chi^2(1) = 3.34$</td>
</tr>
<tr>
<td>Sex for money</td>
<td>42 (52%)</td>
<td>32 (60%)</td>
<td>$\chi^2(1) = 0.94$</td>
</tr>
<tr>
<td>Ever arrested when selling sex for money, %</td>
<td>6 (14%)</td>
<td>7 (22%)</td>
<td>$\chi^2(1) = 0.72$</td>
</tr>
<tr>
<td>&gt;50% of income generated from sex trading, %</td>
<td>23 (55%)</td>
<td>25 (78%)</td>
<td>$\chi^2(1) = 4.35^*$</td>
</tr>
<tr>
<td>Had to share money with procurer, %</td>
<td>9 (21%)</td>
<td>10 (31%)</td>
<td>$\chi^2(1) = 0.92$</td>
</tr>
</tbody>
</table>

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

Having multiple partners with whom sex was exchanged was common. The median number of partners whom the sample traded sex with was 3, and 27% of men and 42% of women traded with four or partners during this period. There were no significant differences by gender in the total number of sex partners. Only 27% reported consistent condom use when sex trading. The majority had received an HIV test before (79%), and 59% was tested in the past year. Violence emerged in the sex trading exchange as 23% of the sample was physically assaulted and 27% was sexually assaulted when trading sex or meeting with partners to do so. Women were more likely than men
to have been physically assaulted.

Among those who traded sex for money, 65% reported that more than half of their income was generated from transactional sex. Reported incomes from sex trading in the past month ranged from 30 ZAR ($3 USD) to 15,000 ZAR ($1,500 USD), with a median income of 500 ZAR ($50 USD). About a quarter (26%) of those who sold sex for money reported being required to share their generated money with a procurer who facilitated the transaction. Harassment from authorities was present as 18% were arrested or detained in the past 3 months for selling sex for money.
Table 3: Correlates of trading sex for tik or money in past 3 months

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Male (N=201)</th>
<th>Female (N=159)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sold sex N=81</strong> (40%) Did not sell N=120 (60%) Odds Ratio</td>
<td><strong>Sold sex N=53</strong> (33%) Did not sell N=106 (67%) Odds Ratio</td>
<td></td>
</tr>
<tr>
<td>Sexual orientation, % gay/lesbian</td>
<td>14 (17%) 8 (7%) 2.93 (1.17-7.34)*</td>
<td>10 (20%) 12 (11%) 1.82 (0.73-4.54)</td>
</tr>
<tr>
<td>Race, % “coloured”</td>
<td>60 (74%) 55 (46%) 2.42 (1.31-4.46)**</td>
<td>43 (81%) 95 (90%) 0.50 (0.20-1.26)</td>
</tr>
<tr>
<td>Age &gt;35, %</td>
<td>11 (14%) 21 (18%) 0.74 (0.34-1.63)</td>
<td>6 (11%) 21 (20%) 0.52 (0.20-1.37)</td>
</tr>
<tr>
<td>Married, %</td>
<td>7 (9%) 14 (11%) 0.72 (0.28-1.86)</td>
<td>3 (6%) 20 (19%) 0.26 (0.07-0.91)*</td>
</tr>
<tr>
<td>HIV, % positive</td>
<td>4 (5%) 4 (3%) 1.51 (0.37-6.21)</td>
<td>2 (4%) 7 (7%) 0.35 (0.11-2.78)</td>
</tr>
<tr>
<td>Child or unemployment government grant, %</td>
<td>9 (11%) 20 (17%) 0.63 (0.27-1.45)</td>
<td>18 (34%) 51 (48%) 0.56 (0.28-1.10)</td>
</tr>
</tbody>
</table>

**Severity of methamphetamine use**

| Daily “tik” use, %                         | 55 (68%) 73 (61%) 1.36 (0.75-2.47) | 32 (60%) 55 (52%) 1.41 (0.72-2.76) |
| ICD amphetamine dependence, %             | 78 (96%) 102 (85%) 4.59 (1.31-16.13)* | 52 (98%) 91 (87%) 8.00 (1.02-62.59)* |
| ICD harmful use, %                         | 71 (92%) 93 (80%) 3.05 (1.18-7.87)* | 49 (96%) 92 (89%) 3.02 (0.69-14.86) |
| Severity of Dependence Score, M (SD)      | 11.73 (3.53) 10.65 (4.44) 1.07 (1.00-1.15)* | 11.11 (3.72) 9.68 (4.12) 1.10 (1.01-1.20)* |
| 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) |

**Concurrent drug use in past 30 days**

| Heavy alcohol use, %                       | 30 (37%) 55 (46%) 0.70 (0.39-1.24) | 17 (32%) 32 (30%) 1.09 (0.54-2.22) |
| Any marijuana (“dagga”), %                | 70 (86%) 106 (88%) 0.84 (0.36-1.96) | 38 (72%) 64 (60%) 1.66 (0.82-3.39) |
| Any methaqualone (“mandrax”), %           | 60 (74%) 86 (72%) 1.13 (0.60-2.13) | 32 (64%) 53 (50%) 1.52 (0.78-2.98) |
| Any heroin (“unga”), %                    | 14 (17%) 9 (8%) 2.58 (1.06-6.28)* | 7 (13%) 7 (7%) 2.15 (0.71-6.50) |

**Sexual risk behaviors in past 3 months**

| Multiple sex partners, %                  | 51 (63%) 16 (13%) 11.05 (5.53-22.10)** | 30 (57%) 15 (14%) 7.91 (3.66-17.10)** |
| Same sex partners, %                      | 30 (37%) 7 (6%) 9.50 (3.91-23.05)** | 14 (26%) 10 (9%) 3.45 (1.41-8.42)** |
| Any unprotected sex, %                    | 38 (47%) 33 (28%) 2.33 (1.29-4.21)** | 33 (62%) 34 (32%) 3.49 (1.75-6.96)** |
| Any unprotected sex with casual partner, % | 23 (28%) 12 (10%) 3.57 (1.66-7.69)** | 18 (34%) 13 (12%) 3.68 (1.63-8.29)** |

**Violence and mental health**

| Victim of sexual assault in past 3 months, % | 33 (41%) 30 (25%) 2.06 (1.13-3.78)* | 29 (55%) 46 (43%) 1.58 (0.81-3.06) |
| Victim of sexual coercion in past 3 months, % | 29 (36%) 24 (20%) 2.23 (1.18-4.22)* | 24 (45%) 17 (16%) 4.33 (2.05-9.17)** |
| Childhood sex trauma, %                   | 21 (26%) 27 (23%) 1.21 (0.63-2.32) | 34 (64%) 34 (32%) 3.79 (1.89-7.59)** |
| Childhood abuse/neglect, %                | 37 (46%) 47 (39%) 1.30 (0.74-2.31) | 26 (49%) 36 (34%) 1.87 (0.96-3.67) |
| PTSD, %                                   | 48 (59%) 59 (49%) 1.50 (0.85-2.66) | 38 (72%) 49 (46%) 2.95 (1.45-5.99)** |
| Moderate to severe depression, %          | 38 (47%) 59 (49%) 0.91 (0.52-1.61) | 31 (59%) 49 (46%) 1.64 (0.84-3.19) |

P<.05; P<.01; P<.001
3.3 Correlates of sex trading

Table 3 presents the binary logistic regressions predicting sex trading for men and women. With respect to demographics, men who identified as gay and Coloured were significantly more likely to trade sex. Unmarried women were more likely to trade sex for tik or money than married women. Age, HIV status, and being a recipient of a government grant did not appear to be positive predictors of trading sex for either men or women.

Addiction-related predictors appeared to be similar across genders. Both men and women who sold sex were significantly more likely to meet the criteria for ICD-10 amphetamine dependence (OR=4.59, 95% CI=1.31-16.13) and (OR=8.00, 95% CI=1.02-62.59), respectively. In the total sample, the severity of dependence score (SDS) was greater among men who traded sex and significantly greater among women who traded sex (OR=1.10, 95% CI=1.01-1.20). Increased average years of methamphetamine use was significantly correlated with sex trading only in men (OR=1.07, 95% CI=1.00-1.15). Poly-substance use was frequently observed in both those who traded sex and those who did not, but marijuana, methaqualone, and heavy alcohol use in the past 3 months were not significantly correlated with sex trading. Concurrent heroin use was greater among women who traded sex (OR=2.15, 95% CI=0.71-6.50) and significantly greater among men who traded sex (OR=2.58, 95% CI=1.06-6.28).

Every sexual risk behavior was significantly correlated with trading sex for tik
or money among men and women. In the past 3 months, having same sex partners was significantly correlated with sex trading in both men (OR=9.50, 95% CI=3.91-23.05) and women (OR=3.45, 95% CI=1.41-8.42). Unprotected sex was also positively correlated with trading sex for tik or money. Men who had any unprotected sex with any type of partner (OR=2.33, 95% CI=1.29-4.21) and had unprotected sex with a casual partner specifically (OR=3.57, 95% 1.66-7.69) were significantly more likely to trade sex. Similarly, women who had any unprotected sex (OR=3.49, 95% CI=1.63-8.29) and had unprotected sex with a casual partner (OR=3.68, 95% 1.63-8.29) were significantly more likely to endorse sex trading.

The mental health status was very poor with high rates of depression, PTSD, and experiences of trauma. While men who experienced physical assault and sexual assault in the past 3 months were more likely to trade sex, women were affected by extensive histories of violence at a much higher proportion than men. Women who reported a childhood history of sexual abuse (OR=4.33, 95% CI=1.89-7.59) and met the screening criteria for PTSD (OR=2.95, 95% CI=1.45-5.99) were more likely to trade sex. Among women, being a victim of sexual assault in the past 3 months was also a very strong predictor of selling sex (OR=4.33, 95% CI=2.05-9.17).

3.4 Gender interactions

Each variable in table 3 was run in an additional set of logistic regressions predicting sex trading with gender and an interaction term between gender and the
predictor variable. There was a gender by childhood sexual trauma interaction (Wald=5.53, p=0.019) and a gender by race interaction (Wald=7.74, p=0.005). No other gender interactions were statistically significant for these variables.
4. Discussion

This study examined sex trading and its correlates in a large sample of community-recruited methamphetamine users in Cape Town, South Africa. Trading sex in exchange for tik or money in the past 3 months was common (37%). Across the sample, high-risk sexual behaviors and drug use severity were key correlates of sex trading. Among men specifically, identifying as Coloured and gay were associated with sex trading. Although recent violence was also correlated with sex trading in men, these factors were greater in women engaging in sex trading. Severe trauma histories and the psychosocial symptoms of PTSD were significant predictors of sex trading among women.

4.1 Dependence and drug use

Results suggest that more severe methamphetamine addiction was strongly associated with sex trading among both men and women. Specifically, more years of regular use, greater severity of dependence, and diagnosis of amphetamine dependence were significant predictors of engaging in sex trading. This is consistent with other research suggesting heavier drug use can be a motivator of transactional sex (J. M. Edwards et al., 2006; Ouellet et al., 1993). It is also compatible with the sentiments expressed in the qualitative data among methamphetamine users trading sex in South Africa (Watt et al., 2015). These interviews highlighted how any act of sex trading was motivated by the desperate need to obtain drugs. Although substance use treatment was
available for free in the study community (K. Johnson et al., 2014), these indicators illustrate the need for more concerted addiction treatment in this population of methamphetamine users. Targeted interventions that link this population to evidence-based addiction care could be an effective solution to reduce the motivation for this kind of transactional sex. The completion of such a program may reduce the influence of addiction as a coercive driver to engage in sex trading.

It is further concerning how heroin was associated with selling 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 notes how heroin is observed among commercial sex workers in South Africa as a popular means to calm nerves after sex (Floyd et al., 2010). As heroin is extremely 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.
4.2 HIV risk

The higher rates of unprotected sex acts amongst those selling sex are particularly concerning as it 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 population is still at risk. The prevalence in the sample is likely much larger given the substantial percentage that has never been tested for HIV or had not been tested for HIV in the past year. Interventions are needed to encourage safer sex practices in this vulnerable community. Challenges to condom utilization include impaired memory from drug use and limited negotiating power, particularly among women (Watt et al., 2015; Watt et al., 2013). In particularly difficult to reach groups such as these, peer education interventions have demonstrated to be effective in increasing condom use in those who sell sex in a LMIC setting (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 (Kimani et al., 2014), respondent-driven sampling may be a suitable strategy to reach people for a targeted intervention in the community. Mobile technologies may also be a successful mode for HIV preventions interventions, which have seen success in South Africa (de Tolly, Skinner, Nembaware, & Benjamin, 2012). Cash transfer programs as well have been associated with a decrease in unprotected sex and transactional sex in South African communities (Cluver et al.,
Cash transfer interventions could address the socioeconomic constraints that drive an individual to sex trading in this particularly poor community. However, in drug using communities, food vouchers would be much more suitable as money may increase drug consumption. Innovative strategies emphasizing safe sex may help to decrease the transmission of new HIV infections and risky sexual behaviors, but must be tailored to the unique characteristics and needs of methamphetamine users who trade sex.

4.3 MSM (Men who have sex with men)

This sample is unique in that men were equally likely to trade sex for tik or money, contrary to the international literature. Although the majority of men who exchanged sex did so with other women, there was a substantial proportion of MSM in the sample, where 81% of the MSM had traded sex. This is consistent with the literature where sex trading amongst men who have sex with men 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 the qualitative study of sex trading in South African methamphetamine users (Watt et al., 2015). The personal anecdotes of sex trading among the men in this sample only reflected trading sex with women, often opportunistically or within the context of an ongoing relationship. This sampling strategy could have excluded this population, as a hesitancy to discuss a taboo behavior like MSM sex trading may exist. 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). Drug use has been observed among MSM to facilitate sexual encounters and increase sexual pleasure during intercourse (Parry et al., 2008). There is, however, a notable lack of research investigating the interpersonal experiences and sexual culture of men who have sex with men in South Africa. More exploratory studies are needed to analyze the factors, motivations, and dynamics of sex trading in this group. In Sub-Saharan Africa and South Africa specifically, 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 is also associated with high risk sexual practices (Arnold, Struthers, McIntyre, & Lane, 2013; Tucker et al., 2014). This leaves this population particularly vulnerable to the HIV risks of sex trading. Any intervention trying to impact sex trading in methamphetamine users must be cognizant of MSM behavior.

4.4 Violence, trauma, and mental health

Women in this community still face unique vulnerabilities. Given gender power dynamics in South Africa, men have much more power in transactional sex exchanges between men and women. Women who traded sex reported higher levels of violence in the form of physical and sexual assault while actively engaging in transactional sex or meeting with a partner to do so. These experiences of violence are consistent with the
content of the qualitative analysis of methamphetamine users who exchange sex (Watt et al., 2015). Women in this sample reported forced sex acts and physical assault, and in the context of methamphetamine use, this violence against women appeared remarkably accepted and normative. 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. South African female sex workers and other at-risk women that received a women-focused education intervention experienced a decrease in acts of violence as well as an increase in condom utilization (Wechsberg, Luseno, Kline, Browne, & Zule, 2010; Wechsberg, Luseno, Lam, Parry, & Morojele, 2006).

There is support to 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 preventative against transactional sex. 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 been victims of violence (J. E. Johnson et al., 2014). As many of these
individuals were sexually assaulted at a young age, addressing these issues as early as possible with a cognitive behavioral approach may thwart the development of PTSD symptoms and initiation of sex trading. A short-term intervention for children who experience trauma has successfully been used in South Africa and may offer therapeutic healing if it is accessible in this type of low-income peri-urban community (Leibowitz-Levy, 2005).

4.5 **Strengths and limitations**

The noteworthy strength of this study is that this is the largest sample of methamphetamine users recruited from the community in South Africa. The use of respondent-driven sampling enabled us to reach a broad sampling of heavy methamphetamine users in the context. This is one of the first quantitative studies identifying correlates of sex trading among active drug users from within a LMIC context. The cross-sectional design of the study limits the scope to one specific point of time. As such, these are associations where causation cannot be inferred. Additionally, a notable limitation is that onsite rapid HIV testing was unavailable in this study. HIV prevalence in the sample was thus likely underreported as self-reported HIV status was relied upon. Some questions are also raised as to the generalizability of these results as this sample of participants was from one peri-urban township. 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.
5. Conclusion

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 an HIV epidemic, the high prevalence of sex trading and its associated HIV risks in this population points to a tremendous need to target this population. Researchers and policy makers can use these results to construct targeted interventions to engage this community. Any 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 individuals in this large community of active methamphetamine users. These targeted interventions can also reduce current sex trading and the harmful behaviors in its practice.
References


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