

Methamphetamine use and HIV risk
Among severely mentally ill inpatients

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Thesis Abstract

Background

Sub-Saharan Africa accounts for 69% of the global HIV burden. Due to a variety of social, economic and behavioural factors, mentally ill patients are more likely to engage in high risk sexual behaviours. In turn, co-morbid substance use which is present in up to 75% of mentally ill patients is a leading risk factor for sexual risk behaviours. Worldwide methamphetamines are the most commonly used illicit stimulant. Both injectable and non-injectable methamphetamines have evidenced associations with high risk sexual behaviours. Smoking and inhalation of crystal methamphetamine is the predominant mode of use in South Africa. The use of crystal methamphetamine amongst mentally ill persons in Cape Town has escalated over the last decade. We aimed to determine the occurrence of methamphetamine use and risky sexual practices amongst mentally ill patients. In addition we aimed to explore the associations between methamphetamine use and HIV sexual risk behaviours in a sample of mentally ill inpatients in Cape Town, South Africa.

Methodology

A total of 100 participants were recruited between July 2010 and March 2012, from the adult in-patient population at a psychiatric hospital in the Western Cape Province of South Africa. Eligible participants included patients with a severe mental illness with and without co-morbid methamphetamine use. A structured interview schedule was used to gather data on demographic and clinical variables. The KAP-Q sexual risk assessment tool was used to assess sexual risk behaviours. The clinician alcohol and drug use scales (AUS, DUS) were used to assess alcohol and illicit drug use. A comparative analysis of sexual risk behaviours was conducted between methamphetamine users and non-methamphetamine users.

Results

The sample consisted of 100 participants made up of 54 males and 46 females. A total of 40 participants (N=40, 40%) reported methamphetamine use in the past 6 months. Co-morbid alcohol use was significantly higher among methamphetamine users (N=27, 67.5%) as compared to non-methamphetamine users (N=27, 45%) ($p=0.027$). Similarly, polysubstance use was also more common among methamphetamine users (N=34, 85%) as compared to non-methamphetamine users (N=12, 20%) ($p<0.001$). The mean age of sexual debut was significantly earlier among methamphetamine users (mean age in years: 15.75) compared to non-methamphetamine users (mean age in years: 18) ($p=0.003$). During the past 6 months, sexual intercourse following substance use was more frequent among methamphetamine users (N=19, 47.5%) compared to non-methamphetamine users (N=15, 25%) ($p=0.023$). Transactional sex was significantly more common among methamphetamine users (N=13, 32.5%) compared to non-methamphetamine users (N=4, 6.7%) ($p<0.001$). Sex with a stranger was also significantly more frequent among methamphetamine users (N=19; 47.5%) compared to non-methamphetamine users (N=16; 26.7%) ($p=0.032$).

Discussion

In this sample, methamphetamine using mentally ill patients as compared to non-methamphetamine users more commonly engaged in high risk sexual practices such as earlier age of sexual debut, intercourse after using drugs, intercourse with a stranger and transactional sex. These results are consistent with international evidence of elevated HIV associated sexual risk behaviours amongst patients with dual diagnosis. Furthermore our study specifically highlights the heightened HIV risk among methamphetamine using mentally ill patients. As such, there should be a greater impetus to screen mentally ill patients for HIV risk indicators and a greater frequency of HIV testing and treatment amongst the South African mentally ill population. Limitations of this study include the cross-sectional design. Substance use was assessed using self-report and not laboratory testing. As such bias from symptom minimization and recall inaccuracies among patients cannot be excluded. Similar to evidence in developed countries, polysubstance use among methamphetamine users is rife and the effect of other substances on HIV associated sexual risk behaviour cannot be excluded. The in-patient study population may restrict generalization of results to out-patient population groups.

Keywords

Mental illness, methamphetamine, sexual behaviour, sexual risk, HIV

Acknowledgements

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Part A: Study Protocol

1.0 Introduction

1.1 Background and Justification of the study:

Worldwide, HIV/AIDS remains a priority health concern. In 2011 UNAIDS estimated 34 million people worldwide were living with HIV. Sub-Saharan Africa continues to carry the greatest proportion of the global burden, accounting for 23 million people currently living with HIV/AIDS. Roughly translated, this suggests 69% of the world's total HIV positive population lives in Sub-Saharan Africa (Joint United Nations Programme on HIV and AIDS [UNAIDS], 2012). Despite the extent of the HIV pandemic, UNAIDS have reported significant success of their global preventative and treatment programs with a 50% decline of newly infected cases in at least 25 countries across the world. As such, UNAIDS has embarked on a mission to achieve zero new cases of HIV infection by 2015. In line with the UNAIDS goals, there has been global and local amplification of HIV preventative and treatment efforts towards "at risk" groups. In South Africa preventative and treatment efforts have been intensified towards young adults, teenage mothers, sex workers and intravenous substance users (UNAIDS, 2012).

There is progressive evidence that mentally ill people have an elevated risk for HIV and bear a disproportionate degree of the epidemic as compared to the general population (Meade & Sikkema, 2005). Depending on the sample studied, the HIV prevalence amongst mentally ill people in the US ranges from 3% to 23% compared to 1% in the general population (Senn & Carey, 2009). Of the limited prevalence data available in South Africa, one study reported an HIV prevalence rate of 29.1% amongst mentally ill people living in Kwa-Zulu Natal (Singh et al., 2002), a rate of almost three times that of the general population. A second study reported a 13% prevalence among female inpatients in the Eastern Cape Province (Uys, 2013) and a third study reported a prevalence of 11% among inpatients at a psychiatric hospital in Pretoria (Henning et al., 2012). Mentally ill people in South Africa may therefore also form part of a HIV vulnerable population who would benefit from robust HIV intervention programs.

Substance abuse plays a key role in the spread of HIV. HIV infection rates appear higher amongst mentally ill people who abuse either non-intravenous or intravenous substances compared to those mentally ill people who abstain from substances (Meade & Sikkema, 2005) The prevalence of alcohol and other illicit substance use disorders amongst mentally ill people has been estimated to range from 20% to as high as 75%, depending on the sample studied (McKinnon, Cournos, & Herman, 2001). Amongst the South African general population alcohol and cannabis remain the most frequently misused substances (Dada et al., 2012). Over the past decade, there has been tremendous escalation of methamphetamine use in South Africa (Plüddemann, Myers, & Parry, 2008). Approximately 30% of the treatment seeking substance using population in South Africa is using crystal methamphetamine (Degenhardt et al., 2010) whilst up to 10-13% of South African mentally ill persons experience methamphetamine use disorders (Weich & Pienaar, 2009). Co-morbid substance

use triples the risk for HIV infection and transmission amongst mentally ill patients (Meade et al., 2008). Both injectable and non-injectable methamphetamine use is associated with risky sexual practices (Degenhardt et al., 2010) and therefore also associated with elevated HIV risk.

Smoked crystal methamphetamine is the most common form of methamphetamine used in South Africa and produces a rapid, potent and long lasting euphoria (Degenhardt et al., 2010). Crystal methamphetamine intoxication is characterized by euphoria, elevated energy levels, social confidence and loss of inhibition including sexual disinhibition (Colfax et al., 2010). There are high rates of methamphetamine use by groups such as sex workers, homosexual and bisexual persons where methamphetamines are used for their ability to enhance erection, delay ejaculation and disinhibit the user to allow for greater sexual expression (Colfax et al., 2010). In turn, there are several high risk sexual practices found specifically among the mentally ill population including: erratic condom usage, multiple sexual partners, prolonged sexual sessions, intercourse with strangers and anal intercourse (Colfax et al., 2010). Of note, women intoxicated with methamphetamine may specifically experience higher rates of sexual coercion (Smit et al., 2006).

The characteristics of the mental illness itself such as low impulse control, mood lability, high hedonistic drives and impaired reality testing may impair ones' ability to accurately interpret events (Meade et al., 2008) and impede ones' ability to foresee consequences of one's' behaviour (Grassi, 1996). In this context, methamphetamine induced euphoria and sexual disinhibition may further impair one's ability to correctly interpret events, accurately assess sexual risk and ultimately make and execute decisions regarding safe sexual practices (Colfax et al., 2010). Avolition and apathy may result in social cognitive deficits where ones' ability to initiate romantic relations is impaired (Carey et al., 2004). As methamphetamines are stimulants, they may be used to enhance social confidence and assist in romantic partnering (Degenhardt et al., 2010). Where methamphetamines are used to facilitate sexual relationships, methamphetamine intoxication may impede ability to recognize and negotiate safer options, thereby increasing the chances of high risk sexual behaviours and therefore of HIV (Colfax et al., 2010). Mentally ill people continue to suffer a high degree of social stigmatization and economic marginalization (Grassi, 1996). High unemployment rates are common amongst the mentally ill and are frequently associated with impoverishment (Gordon, Carey, Carey, Maisto, & Weinhardt, 1999). Impecunious living conditions are in turn associated with illicit substance use, high rates of interpersonal violence and sexual victimization: - all of which elevate the mentally ill persons' risk of HIV (Kloos et al., 2005). The previously held myth of sexual inactivity amongst the mentally ill has in recent years been overturned (Grassi, 1996). Due to several inter-related social, cognitive and psychological factors mentally ill people often engage in high risk sexual practices (Meade & Sikkema, 2005) including: - irregular condoms usage (Randolph et al., 2007), intercourse with persons known for less than a day (Meade, 2006), multiple sexual partners (Randolph et al., 2007), transactional sex (McKinnon et al., 2001) and anal intercourse amongst men not usually engaging in such sexual acts (Carey et al., 2004). Owing to difficulty attaining and maintaining romantic relationships, mentally ill persons are often afraid to jeopardize their

relationships and as such they are hesitant to negotiate safe sexual practices (Gordon et al., 1999).

There is limited research exploring HIV sexual risk behaviours amongst mentally ill adults in South Africa. This sub-population may bear exceptional vulnerability to HIV and therefore be deserving of HIV screening and treatment programmes which are especially adjusted to meet their needs. Improved HIV detection and treatment programmes may enhance prognosis and quality of life as well as impact on global HIV epidemic rates. To our knowledge this is the first South African study examining HIV sexual risk behaviours amongst adult patients with both mental illness and co-morbid methamphetamine use.

1.2 Study aim:

We aim to examine the relationship between sexual risk taking behaviours and co-occurring methamphetamine use disorders in patients with severe mental illness.

1.3 Study Objectives:

1. To assess sexual risk for HIV/AIDS using a structured questionnaire in patients with severe mental illness.
2. To measure the presence of methamphetamine use disorder in a group of in-patients with severe mental illness.

1.4 Hypothesis:

We hypothesize that there will be an association between methamphetamine use and sexual risk behaviour, with methamphetamine using patients being more likely to engage in risk taking behaviours.

2. Method:

2.1(a) Study Design:

This will be a cross-sectional study.

2.1(b) Participants and procedures:

Participants will be recruited from the pre-discharge adult in-patient population at Valkenberg hospital, a tertiary psychiatric hospital in the Western Cape. Participants will be recruited from July 2010 to March 2012.

2.2(a) Study inclusion criteria

1. Participants must be inpatients in the pre-discharge wards between 18 and 59 years of age.
2. Participants must have a severe mental illness, including: - schizophreniform, schizophrenia, schizoaffective, brief psychotic disorder, bipolar mood disorders, unipolar mood disorders with and without psychotic features, substance induced psychotic or mood disorders or psychotic disorders not otherwise specified. A severe mental illness must also persist over time and be associated with severe and persistent disability in social, occupational and other important areas of functioning (Schinnar et al., 1990).
3. Patients must be able to give informed consent.

4. Participants must be conversational in English.
5. We will aim to include patients who have used methamphetamines in the past 6 months so that at least a third of the total sample included such participants. Methamphetamine use was defined by a score of 2 or more on the drug use scale. In addition to methamphetamine use they can have other substance use disorders.

2.2(b) Study Exclusion criteria:

1. Participants unable to understand the purpose of the study
2. Participants having an organic cognitive mental disorder (i.e. dementia, amnesic disorder).

2.3 Measures:

2.3(a) Demographic and clinical information

We will collect data on patient's demographics and related clinical information using a structured questionnaire including a record of patients' multi-axial diagnosis according to DSM-IV criteria.

2.3(b) Sexual risk behaviour:

We will use the KAP-Q sexual risk assessment tool (Smit et al., 2006). The KAP-Q is a structured clinician administered questionnaire that was developed in the Cape Town HIV Consortium in collaboration with the Desmond Tutu HIV Fund. It has proven validity among our local population. This questionnaire assesses sexual risk behaviour for the last 6 months, including the following:

1. Age of sexual debut
2. Number of sexual partners
3. Condom usage
4. Intercourse while intoxicated
5. High risk behaviours such as intercourse with stranger and transactional sex (intercourse in exchange for money/food/accommodation)
6. STD history
7. Self-perceived HIV risk

2.3(c) Drug and alcohol use:

1. We will use clinician administered rating scales: the clinician administered alcohol use scale (AUS) and drug use scale (DUS) (Mueser et al., 1995). These are each 5-point scales based on DSM III-R criteria and assess substance use for the past 6 months. The scale has proven reliability, sensitivity & specificity in populations of patients with serious mental illness (Mueser et al., 1995). All available information including the results from the interview, collateral reports, behavioural observations and laboratory results will be used obtain the final score on the AUS or DUS for the participant.
2. The score descriptions are: - 1= abstinence, 2= substance use **without** impairment, 3= substance **abuse**, 4= **dependence**, 5= dependence with institutionalization. Participants' substance use was rated using this scale. Amongst participants, methamphetamine use was noted as present if the participant scored 2 or greater on the clinician administered

drug use scale while methamphetamine use was noted as absent if the participant scored less than 2.

2.4 Data analysis:

We will conduct a comparative analysis between methamphetamine users and non-methamphetamine users for various items on the sexual risk questionnaire. We will assess the data for deviations from normality by means of the Shapiro-Wilk test for normality. Where appropriate, non-normal data will be log-transformed (log10) prior to analysis. Categorical data will be analysed using the Chi-square or Fisher's exact test where appropriate. Normally distributed continuous data will be analysed using student's t-test. Where log transformation did not normalise data, we will use the Wilcoxon rank-sum test to analyse non-normally distributed data. Significance levels will be set at the 5% level and two-sided tests will be used throughout. All data will be analysed using STATA version 11 for windows (StataCorp, 2009).

2.5 Sample size:

We aim for a sample size of a 100 adult inpatients from the pre-discharge wards at Valkenberg Hospital. We feel this will be sufficient for data analysis.

3. Ethics:

We will seek ethics approval from the Human Research Ethics committee of the University of Cape Town. For the purposes of this study Dr A Moodley will be registered as a co-investigator on a larger umbrella project investigating the presentation, associated risk factors and psychobiology of psychosis. This study is currently recruiting patients at Valkenberg hospital. Furthermore, this study has received ethics approval in 2008 (UCT Ethics number: 332/2008). We will therefore apply for ethics approval of an addendum to the latter study. The addendum will outline the specific objectives of the HIV risk behaviour sub-study described in this protocol, on which Dr Moodley is the main co-investigator. We will in turn apply for a separate ethics number for dissertation purposes linked to this sub-study.

3.1(a) Ethical considerations:

We considered the following points before seeking ethical approval for this study:

1. The study procedure should be individually explained and written informed consent is to be obtained from each participant.
2. Confidentiality of each participant shall be maintained by recording the individuals' hospital number (and not their names) as identification on the paper questionnaire. A register documenting patients' name, surname and correlating hospital number will be kept for record purposes.
3. All collated data is to be stored on a secure database on a password protected computer.
4. No incentive for participation is being offered, and the participant is free to decline and can withdraw at any point during the study
5. The assessment instruments offer minimal risk to the participants.

6. If the participant is assessed as high risk for HIV or voices a desire to receive voluntary counseling and testing (VCT), a note with permission of the patient, informing the primary clinician of this will be made in the patients hospital file.
7. Any affiliation or conflict of interest between the participant and interviewer (I) will be promptly declared.

3.2 Informed Consent:

Written informed consent will be obtained from every participant recruited. The study procedure will be verbally explained by the investigator to the participant. A written paragraph in both English and Afrikaans detailing the rationale behind the study will be available for the participant to read before consenting. The investigator will also be available to answer questions before and after consent is obtained.

3.3 Confidentiality:

All data captured onto our database will be anonymized to protect the confidentiality of our participants. There is only one investigator doing field work for this study.

3.4(a) Potential Benefits:

Few studies have explored the presence of HIV associated sexual risk behaviour amongst mentally ill patients in a South African context. As Sub-Saharan Africa carries the highest prevalence of HIV/AIDS in the world, greater preventative efforts must be made in an attempt to achieve global UNAIDS target of zero new HIV infection cases by 2015. Care must be taken in identifying groups at high risk of contracting HIV and time must be spent in examining factors that contribute to the elevated HIV risk of that particular group. It is internationally reported that mentally ill patients carry a higher prevalence of HIV/AIDS than the general population: - if this were true in South Africa, this would highlight a significant group of people whom should receive improved access to HIV testing and treatment and improved exposure to preventative efforts in an attempt to reduce South African HIV prevalence rates.

In addition, to the author's knowledge, there are no local studies, which look specifically at the association between methamphetamine use and risk for HIV. Locally methamphetamine use increased exponentially and as methamphetamine is known for its effects on sexual behaviour, any information regarding its effect on HIV associated high risk behaviours would be welcomed in the fight against HIV.

3.4(b) Potential harms:

Our questionnaire may prompt realization of one's HIV risk with subsequent initiation of feelings of guilt, anger or depression. We are aware that our participants' mental illness places them at greater emotional and psychological vulnerability and we have attempted to limit undue anxiety by selecting participants from pre-discharge wards and by rigorously informing and educating participants about the study procedure before participation.

In addition, all participation will be recorded in the participant's clinical notes. A note informing the treating team of participants HIV risk as gauged from the KAP-Q questionnaire will also be recorded in the clinical notes.

We will not offer voluntary counselling and testing to the participants ourselves but will encourage the participant to seek testing via the services provided at Valkenberg hospital.

4. Timelines:

We initiated this project in July 2009 and aim to hand in the final dissertation by 15 March 2013

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Part B: Literature Review

Introduction

Severe mental illness (SMI) refers to a range of major psychiatric disorders including but not exclusive to schizophrenia spectrum disorders, bipolar and unipolar mood disorders (Ruggeri et al., 2000; Joint United Nations Programme on HIV and AIDS [UNAIDS], 2012). A severe mental illness must persist over time and be associated with severe, persistent disability in social, work-related and other important areas of functioning (Schinnar et al., 1990). In the developed world, an estimated 30.5% of people are living with mental illness (Kessler et al., 2005) whilst the lifetime prevalence of common mental disorders in South Africa ranges between 9-30% (Stein et al., 2008).

Patients with severe mental illness have an exceptionally high co-morbidity of substance use with lifetime prevalence ranging between 20-70% (Koola et al., 2012; Regier et al., 1990). The phenomenon of mental illness co-occurring with substance use is termed “dual diagnosis” (Smith & Hucker, 1993). There may be individual and environmental factors which increase the likelihood of both dual diagnosis (Dixon et al., 1991) and risk taking behaviours. Among these risk taking behaviours are sexual risk behaviours which facilitate risk for sexually transmitted diseases including human immunodeficiency virus (HIV) (Devieux et al., 2007).

Since the early 1980's, HIV has rapidly progressed to pandemic proportion (UNAIDS, 2012). By 2011 there were 34 million people living with HIV worldwide. Approximately 69% of the global HIV positive population live in Sub-Saharan Africa (UNAIDS, 2011) within which, South Africa has the highest total population prevalence rate of 11% (UNAIDS, 2011).

The Joint United Nations HIV/AIDS Programme, UNAIDS, has envisioned a goal of zero new HIV infection cases by 2015 (UNAIDS, 2011). Consequently there has been an amplification of global HIV preventative and treatment efforts towards “at risk” populations (UNAIDS, 2011). Multiple mechanisms such as socio-demographic factors, characteristics of the mental illness and the phenomenon of dual diagnosis elevate the vulnerability of the mentally ill population to HIV (Carey et al., 2004; Meade, 2006). The presence of co-morbid physical illnesses such as HIV aggravates the disability associated with severe mental illness (Atkinson et al., 2009; Freeman, Patel, Collins, & Bertolote, 2005; UNAIDS, 2011). Prevention of HIV or early identification and treatment is essential in attaining overall wellbeing and improved prognosis in this vulnerable population (Grassi, 1996; Mamabolo et al., 2012; Meade & Sikkema, 2005).

Methamphetamine use in South Africa

Globally 15-60 million people use methamphetamines at least once in their lifetime, making methamphetamines the most frequently used illicit stimulant in the world (Rawson, Anglin, & Ling, 2002; UN office on Drugs and Crime [UNODC], 2009). The South African Community Epidemiology Network on Drug Use (SACENDU) which has monitored alcohol

and other illicit substance use among the general population since 1996 has reported that alcohol followed by cannabis are the most frequently used substances in South Africa (Dada et al., 2012). Since the abolishment of apartheid and restitution of international trade agreements, illicit methamphetamine use in South Africa has significantly increased (Dada et al., 2012). Among the South African treatment seeking population, the Western Cape has the fastest growing prevalence of methamphetamine use increasing from 0.3% in 2002 to more than 30% in 2011 (Dada et al., 2012; Degenhardt et al., 2010). Prevalence of methamphetamine use among mentally ill populations in Western Cape, South Africa ranges between 10-13% (Weich & Pienaar, 2009), which is comparable to the prevalence range of 10-25% among psychiatric populations in North-America and Asia (Koola et al., 2012). Since 1996, SACENDU has consistently recorded the highest methamphetamine use among young adults with the mean age for the period 2006-2013 ranging between 22-26 years of age (Dada et al., 2012). Gender trends among methamphetamine users have also remained consistent since the mid 1990's. SACENDU has recorded twice as many males compared to females seeking treatment for methamphetamine abuse in the Western Cape (Dada et al., 2012). The gender distribution for alcohol and cannabis users in the Western Cape is similar to that of methamphetamine users with males outnumbering females, 70%: 30% (Dada et al., 2012).

Globally methamphetamines are available in several forms ranging from powder to crystals. As a result there are several modes of use including, oral, snorting, inhalation, intravenous injection, intra-rectal and intra-vaginal application (Maxwell, 2005; Vearrier et al., 2012). In South Africa the crystalline form of methamphetamine is most widely used and smoking or inhalation is the favoured mode of use (Degenhardt et al., 2010). Crystal Methamphetamine is "colloquially named "tik" after the sound it makes when smoked (Peltzer et al., 2010). Compared to other modes of use, smoked crystal methamphetamine produces the quickest blood absorption followed by the fastest release of dopamine at the central nervous system. The dopamine released produces an intense euphoria with potent re-inforcing effect (Degenhardt et al., 2010). Crystal methamphetamine intoxication is characterised by euphoria, increased energy levels, hypervigilance, social gregariousness, hypersexuality and a sense of invulnerability (Colfax & Shoptaw, 2005).

Factors facilitating methamphetamine use amongst patients with severe mental illness

A variety of individual, environmental, social and biological factors facilitate methamphetamine use among mentally ill patients. Individual factors may include either endogenous factors such as age and gender or exogenous factors such as early life trauma, co-morbid psychiatric disorders, personality style, poor problem solving abilities and preceding use of gateway drugs (Gregg, Barrowclough, & Haddock, 2007). Current literature reports that majority of global methamphetamine use occurs among young people less than 20 years old (Dada et al., 2012; Marshall et al., 2011; Peltzer et al., 2010). In South Africa, young males more commonly use methamphetamines compared to females (Dada et al., 2012;

Peltzer et al., 2010). Therefore being a young male in South Africa may increase ones' proclivity for methamphetamine use. Reasons for methamphetamine use cited by both genders in the general population include: "wanting to get high", "to party" and "to experiment" (Semple et al., 2004). Female methamphetamine users were more likely than males to offer additional reasons such as: to lose weight, to feel attractive and to cope with depressed mood (Semple et al., 2004). These findings need to be replicated in psychiatric populations. The self-medication theory posits that illicit substances are used to alleviate unwanted symptoms. Negative psychotic symptoms, depressed mood and medication side effects particularly sexual side-effects are commonly self-medicated by psychiatric patients. There is evidence that methamphetamines are used by psychiatric patients to self-medicate anhedonia, avolition and low energy levels (Dixon et al., 1991). Methamphetamines are also used particularly by male patients (Dixon et al., 1991) to combat sexual inadequacies by enhancing erection, delaying ejaculation and increasing energy levels for prolonged intercourse (Colfax & Shoptaw, 2005). Primary or secondary negative symptoms may hinder one's social skills and impair ones' ability to initiate romantic relationships (Dixon et al., 1991; Gordon et al., 1999). Methamphetamine induced talkativeness and social gregariness may remedy impaired social interactional skills (Dixon et al., 1991) and thereby help secure romantic relationships (Meade, 2006). On the other hand, patients lacking assertiveness may be easily coerced into substance use (Gordon et al., 1999; Meade, 2006). There is evidence that users are commonly introduced to methamphetamine by their friends and romantic partners (Sheridan et al., 2009). The use of "gateway drugs" such as tobacco, alcohol and cannabis preceding methamphetamine use is reported by mentally ill populations (Reid et al., 2007). "Gateway drugs" are called so because they pave the way for use of "hard" drugs such as methamphetamine (Russell et al., 2008). The combined effect of several characteristics inherent to certain mental illnesses such as low impulse control, novelty seeking, mood lability, high hedonistic drives and impaired reality testing may intensify the salience of immediate substance induced euphoria and impair ones' ability to foresee distal consequences of substance using behaviour (Carey et al., 2004; Meade, Graff, Griffin, & Weiss, 2008). Early childhood trauma specifically childhood sexual abuse (CSA) is a recognized precipitant of both methamphetamine use (Marshall et al., 2011) and mental illness (Grubaugh et al., 2011). There may therefore be a proportion of mentally ill people with a history of CSA, where the CSA prompts methamphetamine use as a form of self-medication (Halkitis & Shrem, 2006).

Social and environmental factors such as stigmatization and economic marginalisation which are common among patients with severe mental illness (Grassi, 1996; Kawakami et al., 2012; Kessler et al., 2008) may indirectly lead to substance use. Methamphetamine may be used to either induce euphoria and alleviate dysphoria or used to induce social gregariness in an attempt to forge friendships and alleviate social rejection (Dixon et al., 1991; Gottesman & Groome, 1997). Large proportions of mentally ill patients have cited wanting "to fit in with the crowd" and "to feel good" as main reasons motivating meth/amphetamine use (Baker et al., 2002; Gregg et al., 2007). Economic marginalisation associated with low education levels and loss of functioning due to chronic progressive course of severe mental illness may lead to patients moving into and residing in impoverished neighbourhoods where crime and substance use are

common (Kawakami et al., 2012; Kessler et al., 2008). The ease of access to illicit substances coupled with poor impulse control, a characteristic common to a variety of mental illnesses (Carey et al., 2004) elevates the risk for substance use (Mueser et al., 1995). Poverty and unemployment are associated with boredom, unfulfilled expectations and disillusionment. Methamphetamines among other psychoactive substances may provide temporary escapism from the harsh reality of poverty (UNODC, 1999). The relatively weak South African drug law enforcement (Gregg et al., 2007), cheap and easy manufacture process (Gregg et al., 2007) and increasing demand make methamphetamine one of the easiest accessible “hard” drugs in South Africa (Dada et al., 2012). As a result, there is increasing social exposure to methamphetamine use and decreasing societal discrimination against its use.

Methamphetamine use and HIV associated sexual risk behaviour

Both injectable and non-injectable methamphetamine use increases the likelihood of sexual risk behaviours with increased risk for sexually transmitted diseases including HIV (Maher et al., 2011; Parry et al., 2009; Treutlein & Rietschel, 2011). There are several direct and indirect mechanisms linking methamphetamine use with HIV associated sexual risk behaviours (HASRB). Methamphetamine intoxication produces physiological and behavioural effects which enhance likelihood of sexual encounters. Behavioural effects such as intoxication induced euphoria, social gregariousness and talkativeness (Colfax & Shoptaw, 2005; Maxwell et al., 2005) may promote interpersonal relationships whilst hypersexuality secondary to methamphetamine use (Colfax & Shoptaw, 2005; Reback, Larkins, & Shoptaw, 2004) may facilitate progression of interpersonal relations to sexual encounters. Direct sexual enhancing physiological effects of methamphetamine include enhanced erectile function, delayed ejaculation and prolonged intercourse ability. Whilst the majority of evidence of methamphetamines’ physiological sexual enhancing effects come from female sex worker (Maher et al., 2011), men who have sex with men (MSM) (Parry et al., 2008) and adolescents populations (Degenhardt et al., 2010; Plüddemann, Myers, & Parry, 2008) there is evidence of sexual enhancing effects motivating methamphetamine use emerging from mentally ill populations (Baker et al., 2002). There is more evidence of physiological male sexual enhancement as compared to female sexual enhancement (Plüddemann et al., 2008; Semple, Patterson, & Grant, 2002). As such, there may be gender differential sexual risk behaviours among methamphetamine users. Sex marathons, compulsive sexual behaviour where one appears unable to control ones sexual behaviour, multiple sexual partners (Semple et al., 2002), anal intercourse with a partner of unknown or opposite sero-status (Colfax et al., 2001) and unprotected anal intercourse (Colfax et al., 2010) have been reported by males, particularly MSM, using methamphetamines. Higher number of sexual partners, multiple partners, buying sex, using the same condom whilst exchanging partners and irregular condom use are reported more frequently among heterosexual males than heterosexual females using methamphetamine (Liu et al., 2013). Methamphetamine use among females increases likelihood of anal intercourse among women not usually participating in such sexual activities (Stockman & Strathdee, 2010). There is also higher rates of sexual coercion and forced intercourse among females abusing methamphetamine (Maher et al., 2011).

Methamphetamine use is also associated with earlier age of sexual debut (Plüddemann et al., 2008; Springer et al., 2007) and transactional sex, where sex is exchanged for money/drugs/accommodation (Colfax et al., 2010; Semple et al., 2011). Earlier sexual debut and transactional sex are referred to as contextual risk factors which carry increased risk of HIV (UNAIDS, 2011). Female methamphetamine users more commonly report exchanging sex for drugs/money (transactional sex) than male methamphetamine users (Semple et al., 2011). Trading sex is associated with several HIV risk behaviours including: having anal sex among those not usually participating in such practices (Reynolds, Latimore, & Fisher, 2008), sexual victimization as adults (Church et al., 2001) and childhood sexual abuse (Arriola et al., 2005). Female sex workers in South Africa frequently use methamphetamine before, during and after sexual activities (Parry et al., 2008). This is likely for its ability to prolong intercourse and reduce inhibitions (Colfax et al., 2010). Prolonged intercourse increases likelihood of vaginal or anal trauma which increases risk for sexually transmitted diseases including HIV (Colfax et al., 2010). Methamphetamine use is also independently linked to increased likelihood of condom breakage (Stone et al., 1999). Methamphetamine intoxication imparts a sense of invulnerability which when coupled with intoxication induced hypersexuality (Colfax & Shoptaw, 2005) may reduce concerns for safe sex practices (Colfax & Shoptaw, 2005). The pharmacological degrading effects of acute intoxication may further impair decision making skills around safe sex practices (Scott, 2012). Decision making may be additionally impaired by neuro-structural changes secondary to chronic methamphetamine use (Grant et al., 2012). Majority of methamphetamine associated sexual risk behaviour literature is based on MSM or sex worker populations with limited data available from mentally ill populations. It is therefore difficult to extrapolate findings to the mentally ill population.

Mental illness and HIV associated sexual risk behaviour

The HIV prevalence rate is as much as three times higher amongst mentally ill people than the general population (Rosenberg et al., 2001). North American HIV prevalence rates range between 4-23% among mentally ill patients compared to 1% among the general population (Meade & Sikkema, 2005). Depending on the sample studied, prevalence among mentally ill patients in South Africa range between 11-29% (Henning et al., 2012; Singh et al., 2002; Uys, 2013). Previously held myths of sexual inactivity amongst the mentally ill have been dispelled. In a review of HIV risk behaviour among mentally ill people, Meade and Sikkema (Meade & Sikkema, 2005) reported that 50-74% of all patients had been sexually active in the preceding year. Additional evidence show that the majority of sexual activity amongst mentally ill patients is unsafe conferring increased risk for HIV (Carey et al., 1997; Grassi, 1996). HIV associated sexual risk behaviours documented among severely mentally ill patients include; erratic condom usage (Carey et al., 1997; McKinnon, Cournos, & Herman, 2002), transactional sex (Kalichman et al., 1994; McKinnon et al., 2002; Meade & Sikkema, 2005), sexual intercourse with strangers/casual sex (Carey et al., 1997), forced sexual activity (Carey et al., 1997; McKinnon et al., 2002), having a non-HIV sexually transmitted disease (Meade & Sikkema, 2005) and encounters with multiple partners (Cournos, McKinnon, &

Meyer-Bahlburg, 1993; Gottesman & Groome, 1997). A systemic review of HIV risk behaviours among psychiatric patients in 2005 reported gender differences for several high risk behaviours (Meade & Sikkema, 2005). Women with SMI are more commonly sexually active within a steady relationship whilst men with SMI are more likely to have casual sexual relationships (Meade & Sikkema, 2005). Having a lifetime STD history, unprotected sex and transactional sex is more common among women with SMI whilst paying for sex is more common among men with SMI (Meade & Sikkema, 2005). Meade and Sikkema (Meade & Sikkema, 2005) did not find consistent gender differences for having multiple sexual partners. An earlier review by McKinnon, Cournos & Herman (McKinnon et al., 2002) also failed to demonstrate consistent gender differences for multiple partners and receptive anal sex. A recent study which sampled only women with SMI reported high rates of transactional sex, sexual coercion and sex with a partner known/suspected of being sexually unfaithful among participants (Randolph et al., 2007). Meade and Sikkema (Meade & Sikkema, 2005) reported significant negative correlation between age of patient and sexual activity but failed to significantly correlate age with multiple partners, condom usage and transactional sex.

Despite socio-occupational functional decline (Gould, Bowie, & Harvey, 2012) and presence of positive or negative symptoms, sexual interest persists among mentally ill patient (Hales et al., 2006). Negative symptoms and poor cognitive functioning among severely mentally ill patients may impair decision making and negotiation skills around safe sex practices (Gordon et al., 1999). Patients, particularly women with severe mental illness may lack assertiveness skills and in turn be easily coerced into unsafe sexual practices (Gordon et al., 1999; Randolph et al., 2007). Impaired social skills make it difficult for mentally ill patients to attain and maintain romantic relationships (Gordon et al., 1999). There may be gender differential effects on social skills and sexual behaviour. Men need social skills to initiate romantic relationships whilst women need social assertiveness skills to avoid sexual coercion (Weinhardt et al., 1999). Mentally ill patients struggling to attain romantic relations may negotiate sexual relationships with fellow patients whilst at mental health facilities (Kalichman et al., 1994). Periodic same-sex intercourse is more common among male psychiatric patients than female patients (McKinnon et al., 2002). There is limited access to condoms within psychiatric hospital setting resulting in higher rates of unprotected intercourse (McKinnon et al., 2002). Limited social skills among patients may also increase the likelihood of having casual sex and sexual encounters with strangers (Katz, Watts, & Santman, 1994). Hypersexuality and poor impulse control during a manic episode (American Psychiatric Association, 2000) may offer some explanation for the high rates of unprotected sex, transactional sex and multiple partners (Stewart et al., 2012) In psychosis, positive symptoms such as psychotic agitation and excitement are associated with increased rates of sexual behaviour (Meade & Sikkema, 2005). Depression may be associated with lack of motivation to change unsafe sexual practices whilst self-destructive behaviours (Grassi, 1996) may include deliberate practice of unsafe sex.

Knowledge of HIV transmission and sexual risk behaviours are significantly low among mentally ill patients (Carey et al., 2004; Koen et al., 2007). Negative symptoms are specifically associated with reduced awareness of HIV/AIDS and its transmission (Koen et

al., 2007). In addition, patients may have incorrect assumptions regarding HIV transmission such as that only men who have sex with men are at risk and that HIV infected sexual partners always look physically ill (Koen et al., 2007). Mentally ill patients therefore often underestimate their risk for HIV infection resulting in inadequate practice of safe sex (Koen et al., 2007).

Despite international mental illness awareness programmes, social stigmatization of mentally ill patients remains rife (Jackowska, 2009). Stigmatization may foster social isolation (Baumann, 2007). As a result sexual encounters among mentally ill people may serve to satisfy emotional needs thereby reducing likelihood of assertiveness around safe sex (Gordon et al., 1999). Economic marginalization secondary to stigma, progressive course of illness and low education level is common among the mentally ill (Kessler et al., 2008). Patients may hesitate to insist on safe sexual practices in fear of jeopardizing relationships which meet emotional and financial needs (Gordon et al., 1999). Poverty may motivate transactional sex among severely mentally ill patients (Gottesman & Groome, 1997; Kalichman et al., 1994; Meade & Sikkema, 2005).

HIV Risk amongst severely mentally ill patients who abuse methamphetamine

The high HIV prevalence rate among mentally ill patients is elevated three times further by co-occurring substance use (Rosenberg et al., 2001). Co-morbid substance use including methamphetamine use may reflect underlying personality characteristics associated with risk taking (Lejuez et al., 2004). Risk taking behaviours may extend beyond substance use and into HIV associated sexual risk behaviours such as sex with strangers and multiple partners (Meade, 2006). HIV associated sexual risk behaviours (HASRB) reported by psychiatric patients with substance use disorders (inclusive of but not exclusive to methamphetamine use) include unprotected intercourse, lifetime STD history (Meade & Sikkema, 2005), transactional sex (McKinnon et al., 2002), multiple partners (Gottesman & Groome, 1997), unprotected anal intercourse among heterosexual and homosexual mentally ill patients (Susser et al., 1995) and sexual coercion (Kalichman et al., 1994). Hampton et al. found that intravenous methamphetamine use among psychiatric patients was associated with poly-substance use and with having intercourse with anonymous partners (Hampton, Chafetz, & Portillo, 2012). In a review by Meade and Sikkema (Meade & Sikkema, 2005), a range of substances inclusive of but not exclusive to methamphetamine use, positively correlated to current sexual activity among mentally ill patients. This review found no specific associations between meth/amphetamine and sexual risk behaviours (Meade & Sikkema, 2005). An earlier review by McKinnon et al. reported that co-morbid alcohol or other substance abuse disorder was associated with transactional sex among psychiatric patients (McKinnon et al., 2002) where transactional sex was characterised by the following gender differences: men with SMI and substance use disorders were more likely to sell drugs for sex whilst female patients were more likely to sell sex in exchange for drugs. McKinnon et al. did not report any specific association between meth/amphetamine and sexual risk behaviours (McKinnon et al., 2001). Whilst there is a paucity of studies examining associations between meth/amphetamine and

HASRB among psychiatric patients, there are studies which report associations between other psycho-stimulants such as cocaine or crack cocaine and HASRB. Men with SMI who use crack cocaine have increased likelihood of having unprotected intercourse and sex with a high risk partner (McKinnon et al., 2002). Men with SMI who use cocaine report more erratic condom usage (McKinnon et al., 2002), multiple partners and buying sex (Meade et al., 2008) compared to women with SMI and cocaine use who reported higher rates of selling sex (Meade et al., 2008). Literature therefore does depict associations between HASRB and stimulant type psychoactive substances. Based on the similar intoxication effects of meth/amphetamine and cocaine, these two psycho-active substances may share common effects on sexual function but it would be inaccurate to generalise HASRB associations with cocaine to meth/amphetamine. Further research focusing on associations between meth/amphetamine use and HASRB among psychiatric patients is therefore needed.

Mania shares similar characteristics to methamphetamine intoxication: elevated mood/energy levels, hypervigilance, increased social confidence, hypersexuality and a sense of invulnerability (Colfax & Shoptaw., 2005; American Psychiatric Association, 2000). Methamphetamine intoxication may therefore exacerbate hypersexuality, impulsivity and poor judgement associated with mania thereby increasing likelihood of sexual risk behaviours such as transactional sex and multiple partners (Meade et al., 2008). Positive symptoms may be exacerbated by methamphetamine use (Bramness et al., 2012) thereby increasing the severity of mental illness. The greater the severity of the illness, the worse the social assertiveness and decision making skills become (Gordon et al., 1999) resulting in higher rates of sex after substance use and higher rates of erratic condom usage (Randolph et al. 2007). Negative symptom relief by methamphetamine may facilitate romantic partnering (Meade, 2006). Substance initiated relationships are characterised by conflict and instability which in turn may lead to relationship break-ups and rapid partner turnover (Meade, 2006) thereby elevating number of sexual contacts and HIV risk. The impaired cognitive skills of severe mental illness (Koen et al., 2007) may be worsened by acute methamphetamine intoxication (Scott et al., 2007) resulting in further impairment of decision making ability around safe sexual practices.

Stigma exists toward mental illness (Jackowska, 2009) and toward substance use (Link et al., 1997). Therefore dual diagnosis patients may be 'doubly marginalized'. These individuals may tolerate high risk sexual practices in an attempt to decrease social isolation and loneliness (Gordon et al., 1999; Stockman & Strathdee, 2010) Mental illness is associated with low earning potential (Kessler et al., 2008) while substance use is associated with low employment rates (Humensky et al., 2013), therefore poverty is common among dual diagnosis patients. As a result of poverty, substance using mentally ill patients commonly report transactional sex (Devieux et al., 2007).

Meth/amphetamine use in psychiatric patients frequently occurs in the context of polysubstance abuse (Hampton et al., 2012; Katz et al., 1994). It therefore is important to be aware of associations between other non-methamphetamine substances and HASRB in psychiatric patients. Alcohol use among psychiatric patients is common (Weich & Pienaar, 2009). Patients often drink alcohol before, during or after intercourse (Smit et al., 2006). Co-

morbid alcohol use among psychiatric patients is associated with unprotected sexual intercourse (Meade & Sikkema, 2005). Mentally ill women who use alcohol before or during sex are also more likely to participate in anal intercourse (McKinnon et al., 2002). Alcohol use by both genders is associated with higher likelihood of being sexually active (Devieux et al., 2007), transactional sex and casual sex (Smit et al., 2006). Lifetime substance use disorder (inclusive of but not exclusive to alcohol use) was associated with increased likelihood of having a STD (Meade & Sikkema, 2005; McKinnon et al., 2001). There are equivocal results for cannabis use in association with HASRB (Devieux et al., 2007). Psycho-stimulants such as crack cocaine were strongly associated with having sex with a high risk partner and unprotected intercourse among men with SMI (McKinnon et al., 2002). Overall, there is substantial evidence identifying mentally ill patients with co-morbid substance use disorder as having exceptional vulnerability for HIV infection (Meade, 2006).

Gaps in current research and areas in need of attention

Despite South Africa having one of the highest HIV prevalence rates in the world, there is a paucity of research on HIV trends among mentally ill South Africans (UNAIDS 2012). Additionally there is very limited South African information on methamphetamine use among mentally ill patients (Vos et al., 2010; Weich & Pienaar, 2009). Thus far, South African literature in contrast to American literature (Meade 2006; Randolph et al., 2007) has not clearly illustrated that the sexual effects of crystal methamphetamine are the primary motivation behind its use among mentally ill persons.

Although there is a multitude of studies examining the relationship between substance use, mental illness and HIV risk (McKinnon et al., 2002; Meade & Sikkema, 2005; Otto-Salaj et al., 1998), very few studies have looked specifically at the effect of non-intravenous methamphetamine use on HIV sexual risk behaviours among patients with SMI. Meade (Meade, 2006) and Randolph (Randolph et al., 2007) reported that substance use including amphetamine use among mentally ill patients was associated with elevated rates of HIV associated sexual risk behaviours such as erratic condom usage and multiple partners. However, neither Meade (Meade, 2006) nor Randolph (Randolph et al., 2007) distinguished methamphetamine using patients from non-users and neither reported HIV associated sexual risk behaviours specifically associated with methamphetamine usage. Hampton et al. (Hampton et al., 2012) examined sexual risk behaviours among dual and triple diagnosed mentally ill patients. Dual diagnosis referred to co-morbid substance use disorders including intravenous amphetamines whilst triple diagnosis referred to dual diagnosis and HIV or Hepatitis C (Hampton et al., 2012). Hampton et al. (Hampton et al., 2012) reported that intravenous amphetamine use was 2.6 times more frequent among those with triple diagnosis than those with dual diagnosis. Among patients with SMI, specific associations between intravenous amphetamine use and sex with a stranger were reported (Hampton et al., 2012). No further associations between amphetamine use and other HIV associated sexual risk behaviours were reported (Hampton et al., 2012). Intravenous methamphetamine use is uncommon in South Africa (Dada et al., 2012), therefore making it difficult to generalise results to our local setting. Given the large evidence base of methamphetamine associated

HIV sexual risk behaviours among other HIV vulnerable groups such as men who have sex with men (Colfax et al., 2010; Reback et al., 2004), there is an urgent need for exploration of the effects of non-intravenous methamphetamine use on sexual behaviour among mentally ill patients. There is emerging evidence of a high HIV prevalence among mentally ill patients in South Africa (Henning et al., 2012; Singh et al., 2002; Uys, 2013). There is therefore a vital need for improved HIV detection and management among local mentally ill patients. Greater exploration of the effect of substances such as methamphetamine on sexual behaviour among mentally ill patients may help tailor HIV prevention and treatment programmes to meet the specific needs of mentally ill patients.

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Part C: Journal Article

Methamphetamine use and HIV risk among inpatients with severe mental illness.

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Abstract of Journal Article

There is substantial evidence that persons with serious mental illness shoulder a disproportionate share of the HIV pandemic. In South Africa, and most notably, in the Western Cape, methamphetamine use has exponentially increased over the last decade. Use of methamphetamine among HIV vulnerable populations such as the mentally ill, has been associated with higher rates of sexual risk behaviours. The South African HIV epidemic is largely sexually transmitted and as such methamphetamine associated sexual risk behaviours may fuel the HIV epidemic among mentally ill patients. Recognition of methamphetamine associated sexual risk behaviours, may guide HIV prevention and treatment interventions. This study assessed methamphetamine use and explored the relationship between methamphetamine use and sexual risk behaviours among 100 psychiatric inpatients in the Western Cape. Results confirmed that compared to non-methamphetamine using patients, methamphetamine using mentally ill patients were significantly more likely to report sexual risk behaviours such as: earlier age of sexual debut, transactional sex, sex with a stranger and sex following substance use. The study highlights the urgent need for design and implementation of HIV intervention programmes which meet the special needs of the mentally ill. In the meantime, improving the frequency of voluntary testing and counselling to those with mental illness and ensuring delivery of HIV/AIDS awareness programmes at all levels of mental health care delivery in South Africa will assist mentally ill patients in the fight against HIV/AIDS.

Keywords: mental illness; HIV; methamphetamine; sexual risk behaviour; South Africa

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Introduction

For more than a decade there has been growing evidence that mentally ill people have an elevated risk for HIV (Campos et al., 2008; Grassi, 1996; Kalichman et al., 1994; McKinnon, Cournos, & Herman, 2002; Meade & Sikkema, 2005b). South Africa accounts for one of the highest HIV prevalence rates in the world with an estimated 11% total population prevalence rate (UNAIDS, 2011). Depending on the sample studied, the prevalence of HIV among South African mentally ill patients ranges between 11-29% (Henning, Kruger, & Fletcher, 2012; Singh et al., 2002; Uys, 2013). A study in 2002 reported a HIV prevalence in persons with severe mental illness (SMI) of up to three times that of the general population (Singh et al., 2002).

South African Community Epidemiology Network on Drug use, SACENDU, reports non-intravenous substance use is more frequent than intravenous substance use in South Africa (Dada et al., 2012). Since the renewal of international trade agreements in the early 1990's, illicit methamphetamine (MA) use in South Africa has exponentially increased (Pasche & Myers, 2012). The Western Cape province in South Africa has the highest rates of MA use where the estimated proportion of treatment seeking users increased from 0,3% in 2002 to 35% in 2011 (Degenhardt et al., 2010; Plüddemann, Myers, & Parry, 2008; Dada et al., 2012). Methamphetamine intoxication is characterised by euphoria, elevated energy levels, insomnia, anorexia, increased libido (Scott et al., 2012), elevated social confidence and sense of invulnerability (Colfax & Shoptaw, 2005).

In South Africa, HIV/AIDS is predominantly heterosexually transmitted (Gouws & Cuchi, 2012; UNAIDS, 2011). Non-intravenous MA use is associated with sexual risk behaviours such as earlier age of sexual debut (Springer et al., 2007), erratic condom usage (Halkitis, Parsons, & Stirratt, 2001), multiple partners (Semple et al., 2011), sexual intercourse with strangers and transactional sex where sex is exchanged for money/accommodation/substances (Semple et al., 2011). There is emerging reports particularly from male psychiatric patients (Dixons et al., 1991) backing the already substantial evidence base from sex worker (Maher et al., 2011) and homosexual populations (Degenhardt et al., 2010) that MA use is favoured for its sexual enhancing effects of sexual disinhibition, prolonged erection, delayed ejaculation and prolonged intercourse (Degenhardt et al., 2010; Maxwell, 2005). Prolonged intercourse may be associated with vaginal or anal trauma and HIV transmission (Colfax et al., 2010). Co-occurrence of MA use and sexual risk behaviours may be explained by a combination of: underlying personality traits such as impulsivity (Meade, 2006) and intoxication associated increased libido, impaired decision making ability (Grant et al., 2012) and sense of invulnerability (Colfax and Shoptaw, 2005). Among chronic MA users, decision making skills may be further impeded by structural neural changes secondary to chronic use (Grant et al., 2012).

Co-morbid substance use disorders occur in up to 70% of all individuals with severe mental illness (SMI) (Koola et al., 2012; Regier et al., 1990). A recent study in Western Cape, South Africa estimated between 10-13% of mentally ill inpatients use methamphetamine (Weich &

Pienaar, 2009), which is comparable to international methamphetamine prevalence rates of 10-25% amongst mentally ill persons (Kloos et al., 2005). Co-morbid substance use may be driven by novelty seeking and impulsive behaviour characteristic of mania (Meade et al., 2008). Alternatively, substances may be used to relieve negative symptoms and to enable display of emotions, enable patient to talk more, to be more creative (Dixon et al., 1991) and to facilitate romantic relationships (Meade, 2006). Substance initiated relationships are however, characterized by greater conflict (Meade, 2006) greater sexual infidelity and frequent partner turnover (Meade, 2006) thereby increasing the risk for HIV transmission. Additionally, a lack of negotiation skills among patients may allow coercion into substance use (Gordon et al., 1999). Assertiveness skills for safer sexual practices may be further impaired by intoxication (Gordon et al., 1999; Meade et al., 2005b). Fear of jeopardizing an emotionally or financially supportive relationship may reduce patient's insistence on safe sex practices (Gordon et al., 1999). There is substantial evidence of methamphetamine associated sexual risk behaviours amongst sex workers and men who have sex with men, but no local studies and few international studies were found assessing HIV associated sexual risk behaviours (HASRB) in the context of methamphetamine use amongst severely mentally ill persons. Meade (Meade, 2006) found that current or lifetime substance use including amphetamine use, significantly raised the likelihood of HASRB among mentally ill patients. Randolph et al. elicited that substances, including amphetamines, were associated with higher frequencies of unprotected sex and multiple partners among women with SMI (Randolph et al., 2007). Neither Meade (Meade, 2006) nor Randolph et al. (Randolph et al., 2007) distinguished amphetamine users from other substance users and neither reported HASRB specifically associated with methamphetamine use. Hampton et al. (Hampton, Chafetz, & Portillo, 2012) examined sexual risk behaviours among dual and triple diagnosed mentally ill patients where triple diagnosis referred to dual diagnosis (mental illness and co-morbid substance use disorder) and HIV or Hepatitis C (Hampton et al., 2012). Hampton et al. (Hampton et al., 2012) reported that intravenous amphetamine use was more frequent among those with triple diagnosis than those with dual diagnosis. Among patients with SMI, a strong association between intravenous amphetamine use and sex with a stranger were reported (Hampton et al., 2012). No further associations between amphetamine use and other HIV associated sexual risk behaviours were reported in the study by Hampton et al. (Hampton et al., 2012). There is substantial evidence that persons with severe mental illness who also misuse alcohol or illicit substances other than methamphetamines have as much as 3 times elevated risk of HIV (McKinnon, Cournois, & Herman, 2001; Meade et al., 2005b; Meade, 2006; Meade et al., 2008; Rosenberg et al., 2001). Given the paucity of research on methamphetamine use and HASRB, we aimed to describe methamphetamine use and HIV associated sexual risk behaviours (HASRB) amongst a South African population of mentally ill inpatients. We further aimed to explore the relationship between sexual risk behaviours and co-occurring methamphetamine use disorders among mentally ill patients. We hypothesized that there will be a significant association between sexual risk behaviours and methamphetamine use in persons with severe mental illness.

Methods

Sample and participants

This is a cross-sectional study which was conducted between July 2010 and March 2012 in the Western Cape, South Africa. This study received ethical approval from the ethical review board of the University of Cape Town, Medical School. A total of 100 participants were recruited from the adult inpatient population at Valkenberg Hospital which is a state secondary level psychiatric hospital operating in the central health district of the metro region of the city of Cape Town (www.westerncape.gov.za, 2012). Participants were aged between 18-59 years old and had to have a severe mental illness. All participants had to be conversational in English or Afrikaans and had to give written informed consent to enable participation.

Measures

Diagnosis

For the purposes of this study, severe mental illness was defined as having one of a range of major psychiatric disorders such as schizophrenia spectrum disorders, bipolar and unipolar mood disorders (Ruggeri et al., 2000). Schizophrenia spectrum disorders refer to schizophreniform, schizophrenia and schizoaffective disorders. The disorder must persist over time and be associated with severe, persistent disability in social, work-related and other important areas of functioning (Schinnar et al., 1990). All participants were interviewed by a clinician who collated demographic and clinical data using a structured questionnaire. Axis I diagnoses were assessed using diagnostic statistical manual (DSM) IV TR criteria.

Illicit substance and alcohol use

We screened potential participants for the presence or absence of methamphetamine use by perusal of clinical case records and by obtaining additional information from treating clinicians. For eligible patients who agreed to participate we then further assessed drug and alcohol use utilizing two clinician administered scales: the alcohol use scale (AUS) and drug use scale (DUS) (Mueser et al., 1995). These are each 5-point scales based on DSM III-R criteria and assess substance use in the past 6 months. The scales have proven reliability, sensitivity and specificity in patients with serious mental illness (Mueser et al., 1995). Participants with a SMI and methamphetamine use had to score 2 or more on the DUS. The comparison group consisted of participants with a SMI who were free of methamphetamine use.

HIV associated sexual risk behaviour

We used the KAP-Q sexual risk assessment tool, a structured clinician administered questionnaire that assesses sexual behaviour during the past 6 months. The KAP-Q sexual risk assessment tool (Smit et al., 2006) was developed in the Cape Town HIV Consortium in collaboration with the Desmond Tutu HIV Fund. It has proven validity in patients with psychiatric disorders in the South African population (Smit et al., 2006). In addition to the existing questions in this instrument we added a further 3 questions. These questions ascertain the presence of sexual behaviours after the use of substances including anal sex, oral sex, and sex with multiple partners.

Data analysis

We conducted a comparative analysis between methamphetamine users and non-methamphetamine users for various items on the sexual risk questionnaire. We assessed the data for deviations from normality by means of the Shapiro-Wilk test for normality. Where appropriate, non-normal data was log-transformed (log10) prior to analysis. Categorical data was analysed using the Chi-square or Fisher's exact test where appropriate. Normally distributed continuous data was analysed using the student's t-test. Where log transformation did not normalise data, we used the Wilcoxon rank-sum test to analyse non-normally distributed data. Significance levels were set at 5% level and tests were two-sided throughout. All data was analysed using STATA version 11 for windows (StataCorp, 2009).

Results

Sample characteristics

The sample consisted of 100 participants, 46 females and 54 males. Majority (N=70) of the participants were between 18-39 years old and single (N=75), with 11 participants reporting previous marriage and 13 participants currently living with a partner. All participants had attended formal education with 88 participants attaining some level of secondary education. Regarding ethnicity, 60% were of 'coloured' descent, 29% were black, 10% Caucasian and 1% Asian. The ethnic characteristics of the sample reflect the ethnic trends of the Western Cape Metro region where the sample was collected. The Western Cape population is characterised by 49% being 'coloured', 33% 'black', 16% Caucasian, 1% Asian (South African Population census, 2011). The terms 'black' and 'coloured' stem from the Apartheid era in South Africa. 'Coloured' refers to people of mixed European, black and/or Asian ancestry (Wechsberg et al., 2008). The terms do not infer inherent characteristics and for the majority, the term 'coloured' is not considered offensive and preferred to 'mixed race' (Wechsberg et al., 2008).

Participants with a SMI and MA use comprised 40% (N=40) of the total sample. Table 1 compares demographic characteristics between methamphetamine and non-methamphetamine users. There were significant differences between MA and non-MA users in terms of age, gender, marital status, ethnic group and level of education. The majority of MA users were between 18-29 years old (N= 27; 67.5%), single (never married: N=36; 90%), male (N=27; 67.5%), of 'coloured' ethnicity (N=31; 77.5%) and had significantly fewer years of education compared to non-MA users.

Table 1. Demographic characteristics of methamphetamine users and non-users

| Characteristic | Methamphetamine use | | | | Test statistic | Df | P value |
|--|---------------------|------|---------------|------|--------------------|----|---------|
| | Present (N=40) | | Absent (N=60) | | | | |
| | N | % | N | % | | | |
| Age | | | | | | | |
| 18 - 29 | 27 | 67.5 | 15 | 25 | $\chi^2 = 22.15$ | 3 | < 0.001 |
| 30 - 39 | 9 | 22.5 | 19 | 31.7 | | | |
| 40 - 49 | 4 | 10 | 11 | 18.3 | | | |
| 50 - 59 | 0 | 0 | 15 | 25 | | | |
| | | | | | | | |
| Gender | | | | | | | |
| Male | 27 | 67.5 | 27 | 45 | $\chi^2 = 4.89$ | 1 | 0.027 |
| Female | 13 | 32.5 | 33 | 55 | | | |
| Ethnicity | N | % | N | % | | | |
| Caucasian | 2 | 5 | 8 | 13.3 | Fishers exact test | - | 0.022 |
| African | 7 | 17.5 | 22 | 36.7 | | | |
| Coloured | 31 | 77.5 | 29 | 48.3 | | | |
| Asian | 0 | 0 | 1 | 1.67 | | | |
| | | | | | | | |
| Marital status | N | % | N | % | | | |
| never married | 36 | 90 | 39 | 66.1 | $\chi^2 = 7.43$ | 2 | 0.024 |
| past marriage | 2 | 5 | 9 | 15.3 | | | |
| with partner | 2 | 5 | 11 | 18.6 | | | |
| Education Level (Number of years) | | | | | | | |
| Median / iqr | 9 | 3 | 10 | 4 | Wilcoxon rank-sum | - | 0.017 |

Clinical and substance using characteristics of sample

Table 2 contains the diagnostic breakdown of MA compared to non-MA users. Although almost half (N=45) of the total sample received schizophrenia spectrum diagnoses, there were significant differences between the MA users and non-MA users with regards to the axis I psychiatric diagnosis. The majority of MA users (N=20; 50%) received a substance induced diagnosis whereas majority of non-MA users (N=33; 55%) received a schizophrenia spectrum diagnosis. Among the remaining MA users, a diagnosis of schizophrenia spectrum disorder (N=12; 30%) was more common compared to a diagnosis of bipolar mood disorder (N=5; 12.5%) whereas among the remaining non-methamphetamine users, a diagnosis of bipolar mood disorder (N=14; 23.3%) was more frequent compared to substance induced disorders (N=7; 11.7%). There were no significant differences between the MA users and non-MA users in terms of the occurrence of manic episodes in the past 6 months.

Table 3 compares co-morbid substance using trends amongst methamphetamine and non-methamphetamine users. Across both methamphetamine and non-methamphetamine users alcohol was the most frequently used co-morbid substance and was reported by just over half of the total sample (N= 54; 54%). However, methamphetamine users had significantly higher rates of co-morbid alcohol use (N=27; 67.5%) in comparison to non-methamphetamine users (N=27; 45%) (p=0.027). Co-morbid use of substances other than alcohol was also significantly higher among methamphetamine users (N=34; 85%) compared to non-methamphetamine users (N=17; 28.3%) (p<0.001). Among users of other (non-methamphetamine and non-alcohol substances) substances, cannabis was the most frequently used substance (N=51; 51%), followed by methaqualone (N=18; 32.3%), then cocaine (N=3; 5.8%) and lastly ecstasy (N=2; 3.9%). Polysubstance use, defined as concurrent use of 2 or more substances, occurred significantly more frequently in methamphetamine users (N=34, 85%) compared to non-methamphetamine users (N=12; 20%) (p<0.001).

Table 2: Comparison of Axis I diagnoses between methamphetamine and non-methamphetamine users

| Characteristic | Methamphetamine use | | | | Test statistic | df | P value |
|--|---------------------|----------|---------------|----------|------------------|----|---------|
| | Present (N=40) | | Absent (N=60) | | | | |
| Diagnosis | N | % | N | % | | | |
| Schizophrenia spectrum ¹ | 12 | 30 | 33 | 55 | $\chi^2 = 18.04$ | 3 | < 0.001 |
| Bipolar mood disorder type 1 | 5 | 12.5 | 14 | 23.3 | | | |
| Substance induced (SIPD/SIMD) ² | 20 | 50 | 7 | 11.7 | | | |
| Other ³ | 3 | 7.5 | 6 | 10 | | | |
| Mania in past 6 months | N | % | N | % | | | |
| Present | 7 | 17.5 | 14 | 23.3 | $\chi^2 = 0.49$ | 1 | 0.483 |

1 Schizophrenia spectrum disorders include schizophreniform, schizophrenia and schizoaffective disorders

2. SIPD: substance induced psychotic disorder, SIMD : substance induced mood disorder

3 Other diagnoses included: psychosis due to a general medical condition, major depressive disorder, psychosis not otherwise specified

Table 3: Co-morbid substance use amongst methamphetamine and non-methamphetamine users

| Co-morbid Substance use | Methamphetamine use | | | | OR | 95% CI | Test statistic | P value |
|--|---------------------|----------|---------------|----------|-------|--------------|------------------|---------|
| | Present (N=40) | | Absent (N=60) | | | | | |
| Comorbid Alcohol | N | % | N | % | | | | |
| Present | 27 | 67.5 | 27 | 45 | 2.54 | 1.02 - 6.40 | $\chi^2 = 4.89$ | 0.027 |
| Absent | 13 | 32.5 | 33 | 55 | | | | |
| Other Substance use¹ | | | | | | | | |
| Present | 34 | 85 | 17 | 28.3 | 14.33 | 4.68 - 48.06 | $\chi^2 = 30.83$ | <0.001 |
| Absent | 6 | 15 | 43 | 71.7 | | | | |

1 Other substances include cannabis (51%), methaqualone (32.3%), cocaine (5.8%), and ecstasy (3.9%)

Comparison of sexual risk behaviours between methamphetamine and non-methamphetamine users

Table 4 tabulates several high risk sexual behaviours which differed significantly between methamphetamine and non-methamphetamine users whilst table 5 depicts the sexual risk behaviours which did not differ significantly across methamphetamine and non-methamphetamine users. Overall, the majority of the total sample were sexually active during the past 6 months prior to admission (N=71; 71%). The average age of sexual debut was significantly younger among methamphetamine users (mean age in years: 15.75) compared to non-methamphetamine users (mean age in years: 18.0) (p=0.003). Transactional sex was significantly higher among methamphetamine users (N=13; 32.5%) compared to non-methamphetamine users (N=4; 6.7%) (p<0.001). A significantly greater proportion of methamphetamine users (N=19; 47.5%) reported sexual activity after using substances compared to non-methamphetamine users (N=15; 25%) (p=0.02). In addition, significantly greater proportion of methamphetamine users (N=19; 47.5%) reported sex with a stranger compared to non-methamphetamine users (N=16; 26.7%) (p=0.032).

There were no statistically significant differences between methamphetamine versus non-methamphetamine users when compared on other risk markers such as sexual activity in the 6 months preceding admission, the number of sexual partners, condom use, knowledge of STD and HIV, knowledge of male or female condoms, being pressurized into sex, reporting any

sexually transmitted disease in the past 6 months and engagement in oral, anal or multiple partners sex whilst intoxicated (see table 5).

Table 4: Sexual risk characteristics which did differ between methamphetamine and non-methamphetamine users

| KAPQ Characteristics | Methamphetamine use | | | | OR | 95% CI | Test statistic | df | P value |
|---|---------------------|------|---------------|-------|------|--------------|------------------|----|---------|
| | Present (N=40) | | Absent (N=60) | | | | | | |
| Age of first intercourse | | | | | | | | | |
| mean / sd | 15.75 | 3.06 | 18 | 3.85 | - | 0.81 - 3.69 | t = 3.09 | 97 | 0.003 |
| median / iqr | 16 | 4 | 18 | 5 | | | | | |
| Transactional sex: past 6 months¹ | N | % | N | % | | | | | |
| Present | 13 | 32.5 | 4 | 6.7 | 6.74 | 1.82 - 30.46 | $\chi^2 = 11.35$ | 1 | < 0.001 |
| Absent | 27 | 67.5 | 56 | 93.3 | | | | | |
| Sexual activity after substance use: past 6 months | N | % | N | % | | | | | |
| Present | 19 | 47.5 | 15 | 25. | 2.71 | 1.06 - 6.96 | $\chi^2 = 5.41$ | 1 | 0.020 |
| Absent | 21 | 52.5 | 45 | 75. | | | | | |
| Sex with a stranger: past 6 months² | N | % | N | % | | | | | |
| Present | 19 | 47.5 | 16 | 26.7 | 2.49 | 0.98 - 6.31 | $\chi^2 = 4.58$ | 1 | 0.032 |
| Absent | 21 | 52.5 | 44 | 73.3. | | | | | |

1. Transactional sex: sex in exchange for money, drugs or shelter.

2. Sex with a stranger was defined as sexual intercourse with someone known for less than 24 hours

Table 5: Sexual risk behaviours which did not differ significantly between MA & non-MA users

| KAPQ Characteristics | Methamphetamine use | | | | OR | 95% CI | Test statistic | df | P value |
|---|---------------------|-------|---------------|------|------|--------------|--------------------|----|---------|
| | Present (N=40) | | Absent (N=60) | | | | | | |
| Number of sexual partners | | | | | | | | | |
| mean / sd | 6.9 | 5.1 | 5.5 | 5.4 | - | -0.22 - 0.15 | t = -1.73 | 97 | 0.086 |
| median / iqr | 5 | 7 | 4 | 5 | | | | | |
| Knowledge: male condom¹ | N | % | N | % | | | | | |
| Present | 39 | 97.5 | 57 | 96.6 | 1.37 | 0.07 - 82.77 | Fishers exact test | - | 0.799 |
| Absent | 1 | 2.5 | 2 | 3.4 | | | | | |
| Knowledge: female condom¹ | N | % | N | % | | | | | |
| Present | 30 | 75 | 33 | 55.9 | 2.36 | 0.91 - 6.40 | $\chi^2 = 3.75$ | 1 | 0.053 |
| Absent | 10 | 25 | 26 | 44.1 | | | | | |
| Sexual activity: past 6 months | N | % | N | % | | | | | |
| Present | 29 | 73% | 42 | 70% | 1.13 | 0.43 - 3.06 | $\chi^2 = 0.07$ | 1 | 0.787 |
| Absent | 11 | 27.5% | 18 | 30% | | | | | |
| Pressured/forced into sex | N | % | N | % | | | | | |
| Present | 12 | 30 | 14 | 23.3 | 1.41 | 0.51 - 3.81 | $\chi^2 = 0.55$ | 1 | 0.457 |
| Absent | 28 | 70 | 46 | 76.7 | | | | | |
| STD in past 6 months | N | % | N | % | | | | | |
| Present | 11 | 27.5 | 10 | 16.7 | 1.89 | 0.64 - 5.63 | $\chi^2 = 1.70$ | 1 | 0.193 |
| Absent | 29 | 72.5 | 50 | 83.3 | | | | | |
| Oral sex whilst intoxicated | N | % | N | % | | | | | |
| Present | 2 | 5 | 7 | 11.7 | 0.39 | 0.03 - 2.27 | Fishers exact test | - | 0.309 |
| Absent | 38 | 95 | 53 | 88.3 | | | | | |
| Anal sex whilst intoxicated | N | % | N | % | | | | | |
| Present | 1 | 2.5 | 3 | 5 | 0.48 | 0.01 - 6.36 | Fishers exact test | - | 0.648 |
| Absent | 39 | 97.5 | 57 | 95 | | | | | |
| Multiple partners whilst intoxicated | N | % | N | % | | | | | |
| Present | 2 | 5 | 2 | 3.3 | 1.52 | 0.10 - 21.79 | Fishers exact test | - | 1.000 |
| Absent | 38 | 95 | 58 | 96.7 | | | | | |

1. Data missing on one participant

Discussion

Forty percent of a total of 100 participants used MA. In keeping with local and international findings, most MA users within our sample were young (18-39years), single and male (Corsi & Booth, 2008; Meade et al., 2012). As reflected by provincial population trends (South African Population census, 2011) and local studies (Plüddemann et al., 2008), the majority (N=31) of MA users were of mixed ethnic 'coloured' background. MA users (N=34; 85%) were more likely than non-users (N=12; 20%) to report polysubstance use defined as concurrent use of 2 or more substances. Explanations thereof may include the need for 'downers' to enable relief of unwanted effects of MA intoxication such as insomnia (Bramness et al., 2012). Alternatively, polysubstance use may be secondary to underlying personality traits of impulsivity and novelty seeking in the mentally ill person (Meade, 2006). Similar to previous studies by Simbayi et al. (Simbayi et al., 2006) alcohol use was more frequent amongst MA users (67.5%) than non-users (45%).

Consistent with international findings, majority of our patient sample were sexually active (Grassi, 1996). Similar to other studies; we also found that HASRB were higher among mentally ill patients using illicit substances (Cournos & McKinnon, 1997; Meade, 2006; Meade et al., 2008), particularly among those using methamphetamine. Sexual risk behaviours were rife across MA and non-MA using mentally ill patients, reflecting global concerns of unsafe sexual practices amongst seriously mentally ill patients (Counos, McKinnon, & Meyer-Bahlburg., 1993; Cournos & McKinnon, 1997; Grassi, 1996; McDermott, Sautter, Winstead, & Quirk., 1994). This study illustrates the following HASRB were more common among methamphetamine using mentally ill patients compared to non-methamphetamine using patients: earlier age of sexual debut, transactional sex, sex with a stranger and sexual activity following substance use. Our findings of earlier age of sexual debut among methamphetamine users are similar to international findings among methamphetamine users from the general population (Plüddemann, Myers, & Parry, 2008). However it is difficult to make accurate comparisons across dissimilar study populations. Meade (Meade et al., 2006) and Randolph et al. (Randolph et al., 2007) elicited higher rates of HASRB amongst mentally ill patients with substance use inclusive of but not exclusive to amphetamine use. In a sample of female psychiatric patients Randolph et al. (Randolph et al., 2007) reported higher rates of unprotected intercourse and intercourse with multiple partners among substance using patients compared to non-using patients. However, it was difficult to compare our results with either Meade (Meade, 2006) or Randolph et al. (Randolph et al., 2007) because neither had separated amphetamine use from other substance use and neither reported specific HASRB associated with meth/amphetamine use. Hampton et al. (Hampton et al., 2012) explored sexual risk behaviours among dual and triple diagnosed mentally ill patients. Dual diagnosis referred to mental illness with co-morbid substance use disorders including intravenous amphetamines whilst triple diagnosis referred to dual diagnosis and HIV or Hepatitis C (Hampton et al., 2012). Similar to our findings, Hampton et al. described a strong association between amphetamine use and sex with a stranger (Hampton et al., 2012). However, our sample consisted of non-intravenous methamphetamine users whereas

Hampton et al. (Hampton et al., 2012) assessed only intravenous amphetamine use. No further associations between amphetamine use and other HIV associated sexual risk behaviours were reported by Hampton et al. (Hampton et al., 2012). In our study, the high prevalence of transactional sex amongst methamphetamine users (N=13; 32.5%) is particularly concerning. Impoverishment among mentally ill patients may drive sex trade for food or accommodation (Kawakami et al., 2012; Kessler et al., 2008) or patients may exchange sex for more illicit substance (Shannon et al., 2008). We are unaware of studies among patients with SMI, evidencing associations between meth/amphetamine use and intercourse following substance use. Impaired social interactional skills or poor assertiveness combined with sexual disinhibition following methamphetamine intoxication are possible explanations for the high rate of sexual intercourse following substance use among methamphetamine users (N=19; 47.5%) in our sample. Anal intercourse was infrequently reported and therefore varied significantly from reports of HASRB among other MA using populations (Beyrer, 2007; CDC, 2007; Shoptaw & Reback, 2007). Under reporting of anal intercourse may be secondary to stigmatization of homosexual behaviours in South Africa (Dietrich et al., 2011). Overall, this study suggests that methamphetamine use increases the risk of HASRB among people with SMI.

Strengths of this study include its large, ethnically diverse sample population and the inclusion of non-MA, non-substance using mentally ill participants who served as a comparison group to our MA using population. This study does have several limitations. Firstly the study was based on inpatients with SMI, making it difficult to generalise results to outpatient populations. Secondly, under-reporting of sexual behaviours by participants in an effort to avoid stigma (Dietrich et al., 2011) is possible. Thirdly, this study relied on self-reporting of substance using behaviour in the absence of confirmatory laboratory toxicology testing. Minimization of quantity/duration and types of substance use cannot be excluded. In turn, non-specific behaviours such as impulsivity, novelty seeking, and self-destructive behaviours among patients with SMI may act as confounders for HASRB. In addition, a large proportion of MA (N=27; 45%) and non-MA users (N=27; 67.5%) ($p=0.027$) were using alcohol. Alcohol use by itself is associated with sexual risk behaviour such as infrequent condom usage (Weinhardt et al., 2001) and transactional sex (Robertson & Plant, 1988) and may therefore also influence the risk for HASRB. Methamphetamine users had high rates of polysubstance use, where the effect of other substances may elevate risk of HASRB (McKinnon K et al., 2001; Meade et al., 2005b; Meade et al., 2008; Rosenberg, Bleiberg, Kosci, & Gross, 2003) and thereby potentially confound our results. After alcohol, cannabis was the most common concurrently used substance among our sample. There are equivocal results for HASRB and its association with cannabis use (Devieux et al., 2007). This was an exploratory study which examined sexual risk behaviours among MA using mentally ill people compared to non-MA users with SMI. Hence our finding of increased sexual risk behaviours in methamphetamine users compared to non-methamphetamine users needs to be interpreted with caution and can only be considered preliminary. Future research using multivariate statistical procedures examining the effects of MA use on HASRB in persons with SMI and adjusting for the effects of non-MA substance use, co-morbid alcohol use as

well as other potential covariates such as gender age and other demographic variables, is needed.

Conclusion

In conclusion, rates of particular HASRB such as transactional sex, younger age at sexual debut, sex with strangers and sex after drug intoxication are higher among methamphetamine using mentally ill patients as compared to non-users. MA users may therefore constitute a particularly 'high HIV risk group'. There is an urgent need for implementation of an HIV intervention programme designed to meet the needs of patients with SMI. Introduction of HIV/AIDS awareness programmes at all levels of mental health care delivery is an important first step. There is positive evidence for the use of small, intense, HIV risk reduction intervention groups (Berkman, Cerwonka, & Sohler, 2006) amongst mentally ill populations. We suggest continuous psycho-education around HASRB and regular HIV testing amongst this HIV vulnerable population.

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Appendix

Ethics Letter

UNIVERSITY OF CAPE TOWN



Faculty of Health Sciences
Human Research Ethics Committee
Room E52-24 Groote Schuur Hospital Old Main Building
Observatory 7925
Telephone [021] 406 6008 • Facsimile [021] 406 6411
e-mail: lamsses.emjed@uct.ac.za
Website address: <http://www.health.uct.ac.za/research/humanethics/forms/>

04 March 2013

HREC REF: 131/2013

Ms A Moodley
C/o Dr H Tembighi
Psychiatry & Mental Health
3 Block

Dear Ms Moodley

PROJECT TITLE: METHAMPHETAMINE USE AND HIV RISK IN PATIENTS WITH SERIOUS MENTAL ILLNESS: linked to 332/2008: THE PRESENTATION, RISK FACTORS AND PSYCHOBIOLOGY OF PSYCNOSIS

Thank you for your letter to the Faculty of Health Sciences Human Research Ethics Committee dated 25 February 2013.

It is a pleasure to inform you that the Ethics Committee has **formally approved** the above-mentioned study.

Approval is granted until 15 March 2014.

Please submit to the HREC a Progress Report Form if the study continues beyond the approval period. Please submit a Closure Report Form on completion of the study. (Forms can be found on our website: <http://www.health.uct.ac.za/research/humanethics/forms/>)

Please note that the ongoing ethical conduct of the study remains the responsibility of the principal investigator.

Please quote the REC. REF in all your correspondence.

Yours sincerely,

PROFESSOR MARC BLOCKMAN
CHAIRPERSON, FHS human research ethics committee

Federal Wide Assurance Number: FWA00001637.
Institutional Review Board (IRB) number: IRB00001936

Comph

This serves to confirm that the University of Cape Town Research Ethics Committee complies to the Ethics Standards for Clinical Research with a new drug in patients, based on the Medical Research Council (MRC-SA), Food and Drug Administration (FDA-USA), International Convention on Harmonisation Good Clinical Practice (ICH GCP) and Declaration of Helsinki guidelines.

The Research Ethics Committee granting this approval is in compliance with the ICH Harmonised Tripartite Guidelines E6: Note for Guidance on Good Clinical Practice (CPMP/ICH/135/95) and FDA Code Federal Regulation Part 312.56 and 312.61.

Lesedi



21 October 2009

REC REF: 332/2008

Dr H Temmingh
Psychiatry & Mental Health

Dear Dr Temmingh:

PROTOCOL TTTT E2: PRESENTATION AND RISK FACTORS IN THE PSYCHOBIOLOGY OF PSYCHOSIS.

Thank you for your letter to the Research Ethics Committee dated 30th September 2009.

It is a pleasure to inform you that the Ethics Committee has noted and approved the following amendments with reference to the above mentioned study:

- Amendment A: Inclusion of a control population of 200 participants. Controls will be selected according to the criteria specified in your letter dated 30 September 2009.
- Amendment B: Inclusion of a HIV Risk behaviour scale and capacity assessment instruments.

We note that the following co-investigators are included for this sub study:

- Dr J Van Jaarsveld (co-investigator and advisor)
- Dr A Moodley (Registered MMed student)

When submitting the next annual progress report please would the principal investigator include a comprehensive updated protocol which includes a list of all the amendments approved since the initiation of the study? It should also include the most recent version of the informed consent forms and additional necessary documents used in the study.

Guidelines for submitting amendments and annual progress reports are described in our Standard Operating Procedures and relevant forms are available electronically.

Please note that the ongoing ethical conduct of the study remains the responsibility of the principal investigator.

Yours

Yours sincerely

PROFESSOR M BLOCKMAN
CHAIRPERSON, ESE HUMAN ETHICS

6/10/11

Questionnaire

| | |
|---------------|-------|
| Date: | Time: |
| Patient code: | Ward: |

Section A: Demographics

First I'm going to ask you a few background questions.

1. Sex (Code by observation)

| | |
|------|--------|
| Male | Female |
|------|--------|

2. What is your date of birth?

| | |
|----------|-----------|
| dd/mm/yy | Age |
| | 10 – 20 : |
| | 21 – 30 : |
| | 31 – 40 : |
| | 41 – 50 : |
| | 51 – 60 : |

3. Which of the following best describes your race?

| | | | | | |
|-----------------|--|-------|--|----------|--|
| White/Caucasian | | Black | | Coloured | |
| Indian | | Asian | | Other | |
| Missing | | | | | |

4. What is your marital status?

| | | | | | |
|---------|--|---------------|--|-------------|--|
| Married | | Separated | | Divorced | |
| Widowed | | Never married | | Co-habiting | |

5. How many children do you have?

| | | |
|----------------|------|------------------|
| Number of Chn: | None | Refuse to answer |
|----------------|------|------------------|

6. How many of your children are under 18?

| | | |
|-----------------|------|------------------|
| Number of Chn.: | None | Refuse to answer |
|-----------------|------|------------------|

7. What is the highest grade in school you have completed?

8. Do you have a university degree or diploma?

| | | |
|-----|----|------------------|
| Yes | No | Refuse to answer |
|-----|----|------------------|

9. If Yes, what degree is that?

| |
|--|
| |
|--|

10. Do you have any other training? (SPECIFY HERE)

11. Have you been a student during the past year?

| | | |
|-----|----|------------------|
| Yes | No | Refuse to answer |
|-----|----|------------------|

12. What level are you studying at?

| | | | | | |
|------------------|--|-------------|--|------------------|--|
| Secondary school | | High school | | Undergraduate | |
| Postgraduate | | Technikon | | Technical school | |
| Trade school | | Other | | Refuse to answer | |

Section B: Substance use

Now I will ask you a few questions about substance use.

1. Have you used any of the following substances in the past 6 months? Circle the substance/s used.

| SUBSTANCE | TICK IF YES | DRUG OF CHOICE | AGE AT 1 ST USE | WHEN LAST USED | CURRENT USE ≤ 1 MONTH | WITHIN ≤ 6 MONTHS | LIFETIME USE | RATE ON DUS |
|-----------------|-------------|----------------|----------------------------|----------------|-----------------------|-------------------|--------------|-------------|
| CANNABIS | | | | | | | | |
| METH/TIK | | | | | | | | |
| METHAQUALONE | | | | | | | | |
| CRACK COCAINE | | | | | | | | |
| COCAINE HCL | | | | | | | | |
| HEROIN | | | | | | | | |
| ECSTACY/LSD | | | | | | | | |
| BENZOS/SEDATIVE | | | | | | | | |
| ANALGESIAC | | | | | | | | |
| OCP | | | | | | | | |
| OTHER | | | | | | | | |

2. Regarding alcohol use:

| | TICK IF YES | DRUG OF CHOICE | AGE OF 1 ST USE | WHEN LAST USED | CURRENT USE ≤ 1 MONTH | USE WITHIN ≤ 6 MONTHS | LIFETIME USE | RATE ON AUS |
|---------|-------------|----------------|----------------------------|----------------|-----------------------|-----------------------|--------------|-------------|
| ALCOHOL | | | | | | | | |

Section C: HIV status and physical health:

1. Have you ever had an HIV test? YES / NO

2. If YES, when was the test done?

| | | |
|--------------------------|----------------|--------------------------------|
| DURING CURRENT ADMISSION | ≤ 3 MONTHS AGO | IF > 3 MONTHS AGO SPECIFY WHEN |
|--------------------------|----------------|--------------------------------|

a. If YES, what was the result?

Positive /Negative / Unknown

3. Regarding HIV status:

| | | | |
|--|----------|----------|---------|
| HIV status known by patient on current interview | Yes | No | |
| HIV status known by treating team on admission | Yes | No | |
| Present day HIV status | Positive | Negative | Unknown |
| Result of the most recent CD4+ count | | | Unknown |

University of Cape Town

KAP-Q Questionnaire

Section D: HIV Risk behaviour scale: KAP- Q scale.

This section will ask you some personal questions about your sexual experiences, condom-use and other issues that have been known to increase the risk of contracting the HIV virus. Some of these questions are very personal and may cause discomfort. You can refuse to answer any question you are not comfortable with but we would appreciate it if you try to answer all questions as honestly as possible. Remember that all answers are CONFIDENTIAL.

| Risk Behaviours | |
|---|--|
| Please note that the word sex refers to vaginal, anal and oral sex | |
| 1. At what age did you first have sex? | Age in years _____ |
| 2. Who was the first person you had sex with? please choose only one | <input type="checkbox"/> Husband / Steady partner <input type="checkbox"/> Friend <input type="checkbox"/> Stranger – consensual ('one-night stand') <input type="checkbox"/> Stranger – non-consensual (Rape) <input type="checkbox"/> Other <input type="checkbox"/> Refuse to answer |
| 3. How many people have you had sex with in your life? | Number _____ |
| 4. Do you know what a male condom is? | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unsure <input type="checkbox"/> Refuse to answer |
| 5. Do you know what a female condom is? | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unsure <input type="checkbox"/> Refuse to answer |
| 6. Have you EVER used a male or female condom during sex? | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Refuse to answer |
| 7. Have you had sex in the last 6 months ? | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Refuse to answer |
| 8. Have you used a male or female condom during sex in the last 6 months ? | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Refuse to answer |
| 8a. If YES, where do you get your condoms? | <input type="checkbox"/> Shop <input type="checkbox"/> Pharmacy <input type="checkbox"/> Hospital <input type="checkbox"/> Community clinic <input type="checkbox"/> Bar/hotel/restaurant/shebeen |

| | |
|---|--|
| <p>please only tick ONE or TWO that MOSTLY apply to you</p> | <input type="checkbox"/> Friend <input type="checkbox"/> Other <input type="checkbox"/> Refuse to answer |
| <p>9. During the past 6 months, did you have sex in exchange for money, drugs or a place to stay?</p> | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Refuse to answer |
| <p>10. During the past 6 months have you had sex after heavily using alcohol, dagga (ganja) or other drugs?</p> | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Refuse to answer |
| <p>11. During the past 6 months have you had sex with a person you had known for less than one day?</p> | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Refuse to answer |
| <p>12. Have you ever been raped or pressured into unwanted sex?</p> | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Refuse to answer |
| <p>13. Have you ever heard of sexually transmitted diseases (or STDs) other than HIV that can be transmitted through sexual intercourse?</p> | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Refuse to answer |
| <p>14. During the past 6 months, have you had a sexually transmitted disease, where you had a genital discharge and/or sores/ulcers that needed treatment at the hospital or clinic?</p> | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Refuse to answer |
| <p>15. Have you ever been part of a traditional practice, where a group of people shared the same knife/needle for cutting (circumcision or scarification for example)?</p> | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Refuse to answer |
| <p>16. In the past year, have you been to any of the following health providers for any health problem?</p> | <input type="checkbox"/> Nurse / doctor at a hospital <input type="checkbox"/> Private doctor or GP <input type="checkbox"/> Chemist / Pharmacist <input type="checkbox"/> Traditional healer <input type="checkbox"/> Healing church <input type="checkbox"/> Other <input type="checkbox"/> I was not sick during the last year <input type="checkbox"/> Refuse to answer |
| <p>17. Do you know if the person or people you are currently having sex with are HIV positive?</p> | <input type="checkbox"/> Yes, one of them is definitely HIV positive <input type="checkbox"/> No, all of them were tested and are HIV negative <input type="checkbox"/> Unsure, some of them may be HIV positive but I cannot say for sure <input type="checkbox"/> Refuse to answer |

| | |
|---|---|
| 17a) If YES, do you use a condom during sex? | <input type="checkbox"/> All of the time <input type="checkbox"/> Most of the time <input type="checkbox"/> Some of the time <input type="checkbox"/> Never <input type="checkbox"/> Refuse to answer |
| 18. Do you think that any of the people you are currently having sex with may be at risk for becoming HIV positive? | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unsure <input type="checkbox"/> Refuse to answer |
| 19. Do you think you may be at risk for becoming HIV positive? | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unsure <input type="checkbox"/> Refuse to answer |
| 20. Do you think someone else, such as a friend for example, who has the same lifestyle that you have may be at risk of becoming infected with HIV? | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unsure <input type="checkbox"/> Refuse to answer |

Sexual Risk Questionnaire, prepared by Joalida Smit and Keren Middelkoop of the Cape Town HIV Consortium

Translated: July 2003

In addition to KAPQ questions, ask the following question:

Have you, while intoxicated, engaged in any of the following sexual behaviours that you otherwise (i.e. had not been intoxicated) would not have participated in?

| | | | | | | | | |
|-------------------|-----|--------------------------|----|--------------------------|--------|--------------------------|-----------|--------------------------|
| Oral intercourse | YES | <input type="checkbox"/> | NO | <input type="checkbox"/> | UNSURE | <input type="checkbox"/> | NO ANSWER | <input type="checkbox"/> |
| Anal intercourse | YES | <input type="checkbox"/> | NO | <input type="checkbox"/> | UNSURE | <input type="checkbox"/> | NO ANSWER | <input type="checkbox"/> |
| Multiple partners | YES | <input type="checkbox"/> | NO | <input type="checkbox"/> | UNSURE | <input type="checkbox"/> | NO ANSWER | <input type="checkbox"/> |
| Other | YES | <input type="checkbox"/> | NO | <input type="checkbox"/> | UNSURE | <input type="checkbox"/> | NO ANSWER | <input type="checkbox"/> |

Section E: Clinical data.

1. Age of onset of illness(in years) :

| | | | | |
|------|---------|---------|---------|---------|
| ≤ 20 | 21 – 30 | 31 – 40 | 41 – 50 | 51 – 60 |
| | | | | |

2. Principle Axis I diagnosis according to DSM-IV (Working/clinical team diagnosis)

| DSM-IV diagnosis: | Comments/subtype/specs | X |
|--------------------------------------|------------------------|---|
| Schizophrenia | | |
| Schizophreniform disorder | | |
| Bipolar type I mood disorder | | |
| Schizoaffective disorder | | |
| Brief psychotic disorder | | |
| Delusional disorder | | |
| Major depressive disorder | | |
| Psychotic disorder due to GMC | | |
| Substance induced psychotic disorder | | |
| Substance induced mood disorder | | |
| Other: Specify | | |

3. Number of previous hospital admissions for mental illness:

4. Have you had any hospital admissions prior to the current admission in past 6 months?

| | |
|------------------------------|-----------------------------|
| YES <input type="checkbox"/> | NO <input type="checkbox"/> |
|------------------------------|-----------------------------|

5. Is the patient, based on clinical judgment & treating team, currently manic?

| | |
|------------------------------|-----------------------------|
| YES <input type="checkbox"/> | NO <input type="checkbox"/> |
|------------------------------|-----------------------------|

6. Have you had any previous episodes of mania prior to the current admission in past 6 months?

| | |
|------------------------------|-----------------------------|
| YES <input type="checkbox"/> | NO <input type="checkbox"/> |
|------------------------------|-----------------------------|

7. Is impulsivity reported by patient?

| | |
|------------------------------|-----------------------------|
| YES <input type="checkbox"/> | NO <input type="checkbox"/> |
|------------------------------|-----------------------------|

8. Is impulsivity observed during this interview?

| | |
|------------------------------|-----------------------------|
| YES <input type="checkbox"/> | NO <input type="checkbox"/> |
|------------------------------|-----------------------------|

9. Is patient currently psychotic (but able to consent)?

| | |
|------------------------------|-----------------------------|
| YES <input type="checkbox"/> | NO <input type="checkbox"/> |
|------------------------------|-----------------------------|

10. Have you had any previous episodes of psychosis prior to the current admission during the past 6 months?

| | |
|------------------------------|-----------------------------|
| YES <input type="checkbox"/> | NO <input type="checkbox"/> |
|------------------------------|-----------------------------|

11. Is the patient, based on clinical judgment/ treating team, currently depressed?

| | |
|------------------------------|-----------------------------|
| YES <input type="checkbox"/> | NO <input type="checkbox"/> |
|------------------------------|-----------------------------|

12. Is cognitive slowing observed during the interview?

| | | |
|------------------------------|-----------------------------|--------------------------|
| YES <input type="checkbox"/> | NO <input type="checkbox"/> | <input type="checkbox"/> |
|------------------------------|-----------------------------|--------------------------|

13. Is there evidence of an Axis II diagnosis OR Axis II Traits?

| | | |
|--|---|--|
| On History YES <input type="checkbox"/> NO <input type="checkbox"/> | On record in clinical notes YES <input type="checkbox"/> NO <input type="checkbox"/> | On clinical suspicion during interview YES <input type="checkbox"/> NO <input type="checkbox"/> |
|--|---|--|

14. If present, record the Axis II diagnosis/traits:

| |
|----------|
| |
|----------|

Clinician administered Alcohol Use Scale

FORM C.2

Alcohol Use Scale—Revised (AUS-R)

Client name:

Rater:

Date:

INSTRUCTIONS

This scale pertains to your client's use of alcohol over the past 6 months. Rate the *worst* period of alcohol use during this interval. If the client is in an institution, the reporting interval is the time period prior to institutionalization. Complete the information-gathering portion of this form, and then rate your client on the 5-point Rating Scale at the end of this form.

Use

Inquire whether the client has used alcohol over the past 6 months.

No

Yes

If no, give the client a 1 on the Rating Scale and complete the "Sources of Information" section at the end of this form. If yes, complete the rest of the form.

Abuse

Consequences of use in past 6 months. Check all recurrent problems related to the alcohol use that have persisted for *at least 1 month*. Use client report, plus any other sources of information (i.e., urine screens, collateral reports).

Social functioning and legal status

Family problems

Housing instability

Social difficulties (e.g., arguments, threats of violence, or violent behavior)

Social isolation

Difficulty budgeting funds

Prostitution

Other legal problems

(continued)

From *Integrated Treatment for Dual Disorders* by Kim T. Mueser, Douglas L. Noordsy, Robert E. Drake, and Lindy Fox. Copyright 2003 by The

Guilford Press. Permission to photocopy this form is granted to purchasers of this book for personal use only (see copyright page for details).

Role functioning

Employment difficulties (e.g., loss of job, accidents on the job)

Difficulty attending or keeping up in school

Parenting difficulties (e.g., failure to care for children)

Physical status

Hygiene problems

Change in physical appearance

Health problems

Injuries

Psychiatric status

Treatment nonadherence

Suicidal thoughts

Cognitive impairment

Symptom relapses

Sudden mood shifts

Appearance of new symptoms

Use in dangerous situations

When driving

When operating machinery

If no problems are noted for abuse, stop here and rate client a 2 on the Rating Scale. If problems are noted, check for dependence (below).

Dependence

The client needs to have at least one symptom present in three out of the following seven categories to meet criteria for dependence. If not, rate the client a 3 on the Rating Scale for abuse.

1. Greater amounts or intervals of use than intended

Drinking more than planned

Drinking longer than planned

Repeated unsuccessful attempts to cut down

2. Frequent intoxication, or withdrawal, interferes with other activities

Spending most of the time drinking

Frequent hangovers

(continued)

3. Important activities given up because of alcohol use

Drinking instead of working

Drinking instead of spending time on leisure activities

Drinking instead of spending time with family or friends

4. Continued use despite knowledge of alcohol-related problems

Drinking is causing problems, but client continues to drink

5. Marked tolerance

Needing to drink a lot more to get high

Diminished effect with use of same amount of alcohol

6. Characteristic withdrawal symptoms

Sweating

Racing heart

Hands shaking

Trouble sleeping

Feeling nauseated or vomiting

Feeling agitated

Feeling anxious

7. Alcohol taken to relieve or avoid withdrawal symptoms

Drinking to keep from getting sick from withdrawal symptoms

Drinking to stop the shakes or other withdrawal symptoms

If the client meets the criteria for dependence, move on to see whether the client has severe dependence, where problems are so severe that living in the community is difficult.

DEPENDENCE WITH INSTITUTIONALIZATION

Psychiatric hospitalization(s)

Inpatient treatment(s) for substance abuse

Incarceration(s)

If the client has had more than one psychiatric hospitalization, inpatient treatment for substance abuse, or incarceration, or if the client has spent 3 or more months of the past 6 institutionalized, rate the client a 5 on the Rating Scale. If none of these apply, rate the client a 4.

(continued)

All

Rating Scale

Based on the information summarized on the previous pages, rate your client's use of alcohol during the worst period over the past 6 months, according to the following scale.

1 = Abstinence. Client has not used alcohol over the past 6 months.

2 = Use without impairment. Client has used alcohol over the past 6 months, but there is no evidence of persistent or recurrent problems in social functioning, legal status, role functioning, psychiatric status, or physical problems related to use, and no evidence of recurrent dangerous use.

3 = Abuse. Client has used alcohol over the past 6 months, and there is evidence of persistent or recurrent problems in social functioning, legal status, role functioning, psychiatric status, or physical problems related to use, or evidence of recurrent dangerous use. For example, recurrent alcohol use leads to disruptive behavior and housing problems. Problems have persisted for at least 1 month.

4 = Dependence. Client meets criteria for abuse, plus at least three of the following: greater amounts of use than intended; much of time spent obtaining or using alcohol; frequent intoxication or withdrawal interferes with other activities; important activities given up because of alcohol use; continued use despite knowledge of alcohol-related problems; marked tolerance; characteristic withdrawal symptoms; or alcohol taken to relieve or avoid withdrawal symptoms. For example, drinking binges and preoccupation with drinking have caused client to drop out of job training and non-drinking-related social activities.

5 = Dependence with institutionalization. Client meets criteria for dependence, plus related problems are so severe that they make noninstitutional living difficult. For example, constant drinking leads to disruptive behavior resulting in incarceration.

Sources of Information

Client self-report

Observations by clinician(s)

Lab tests

Collateral sources (specify):

Mother

Father

Sibling

Spouse/boyfriend/girlfriend

Child

Other relative

Friend

Landlord

Police/probation/parole officer

Other ()

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Clinician administered Drug Use Scale

FORM C.3

Drug Use Scale—Revised (DUS-R)

Client name:

Rater:

Date:

INSTRUCTIONS

This scale pertains to your client's drug use over the past 6 months. Rate the *worst* period of drug use during this interval. If the client is in an institution, the reporting interval is the time period prior to institutionalization. Complete the information-gathering portion of this form, and then rate your client on the 5-point Rating Scale at the end of this form.

Use

Inquire whether the client has used drugs (other than as prescribed) over the past 6 months.

No

Yes

If no, give the client a 1 on the Rating Scale and complete the "Sources of Information" section at the end of this form. If yes, complete the rest of the form.

Mark drugs used:

Sedatives/hypnotics/anxiolytics

Cannabis

Stimulants

Opioids

Cocaine

Hallucinogens

Over-the-counter (specify)

Other (specify)

See last page of form for specific drugs within each category and slang words.

(continued)

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FORM C.3. Drug Use Scale—Revised (*page 2 of 6*)

Abuse

Consequences of use in past 6 months. Check all recurrent problems related to the drug use that have persisted for *at least 1 month*. Use client report, plus any other sources of information (i.e., urine screens, collateral reports).

Social functioning and legal status

Family problems

Housing instability

Social difficulties (e.g., arguments, threats of violence, or violent behavior)

Social isolation

Prostitution

Difficulty budgeting funds

Other legal problems

Role functioning

Employment difficulties (e.g., loss of job, accidents on the job)

Difficulty attending or keeping up in school

Parenting difficulties (e.g., failure to care for children)

Physical status

Hygiene problems

Change in physical appearance

Health problems

Injuries

Psychiatric status

Treatment nonadherence

Suicidal thoughts

Cognitive impairment

Symptom relapses

Sudden mood shifts

Appearance of new symptoms

n dangerous situations

When driving

When operating machinery

problems are noted for abuse, stop here and rate client a 2 on the Rating Scale. If problems are

I, check for dependence (below).

(continued)

Dependence

The client needs to have at least one symptom present in three out of the seven categories to meet criteria for dependence. If not, rate the client a 3 on the Rating Scale for abuse.

1. Greater amounts or intervals of drug use than intended

Using more drugs than planned

Using drugs longer than planned

Repeated unsuccessful attempts to cut down use of drugs

2. Frequent drug use or withdrawal interferes with other activities

Spending most of the time using drugs

Lengthy time spent recovering from effects

3. Important activities given up because of drug use

Using drugs instead of working

Using drugs instead of spending time on leisure activities

Using drugs instead of spending time with family or friends

4. Continued use despite knowledge of drug-related problems

Drug use is causing problems, but client continues to use

5. Marked tolerance

Needing to use a lot more drugs to achieve desired effect

Diminished effect with use of same amount of drug

6. Characteristic withdrawal symptoms

Sedatives/hypnotics/anxiolytics

Sweating or increased pulse rate

Increased hand tremor

Insomnia

Nausea or vomiting

Transient visual, tactile, or auditory hallucinations or illusions

Anxiety

Grand mal seizures

Stimulants/cocaine

Dysphoric mood

Fatigue

Vivid, unpleasant dreams

Insomnia or hypersomnia

Increased appetite

Psychomotor retardation or agitation

(continued)

Alb

FORM C.3. Drug Use Scale—Revised (*page 4 of 6*)

Opiates

Dysphoric mood

Nausea or vomiting

Muscle aches

Pupillary dilation

Diarrhea

Fever

Insomnia

Sweating

7. Drug taken to relieve or avoid withdrawal symptoms

Use to keep from getting sick from withdrawal symptoms

Use when feeling sick with withdrawal symptoms

If the client meets the criteria for dependence, move on to see if the client has severe dependence, where problems are so severe that living in the community is difficult.

Dependence with Institutionalization

Psychiatric hospitalization(s)

Inpatient treatment(s) for substance abuse

Incarceration(s)

If the client has had more than one psychiatric hospitalization, inpatient treatment for substance abuse, or incarceration, or if the client has spent 3 or more months of the past 6 institutionalized, rate the client a 5 on the Rating Scale. If none of these apply, rate the client a 4.

Rating Scale

Based on the information summarized on the previous pages, rate your client's use of drugs during the worst period over the past 6 months according to the following scale.

1 = Abstinence. Client has not used drugs over the past 6 months.

2 = Use without impairment. Client has used drugs over the past 6 months, but there is no evidence of persistent or recurrent problems in social functioning, legal status, role functioning, psychiatric status, or physical status related to use, and no evidence of recurrent dangerous

use.

3 = Abuse. Client has used drugs over the past 6 months, and there is evidence of persistent or recurrent problems in social functioning, legal status, role functioning, psychiatric status, or physical status related to use, or evidence of recurrent dangerous use. For example, recurrent drug use leads to disruptive behavior and housing problems. Problems have persisted for at least 1 month.

(continued)

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FORM C.3. Drug Use Scale—Revised (*page 5 of 6*)

4 = Dependence. Client meets criteria for abuse, plus at least three of the following: greater amounts of use than intended; much of time spent obtaining or using drugs; frequent intoxication or withdrawal interferes with other activities; important activities given up because of drug use; continued use despite knowledge of substance-related problems; marked tolerance; characteristic withdrawal symptoms; or drugs taken to relieve or avoid withdrawal symptoms. For example, binges and preoccupation with drugs have caused client to drop out of job training and non-drug-related social activities.

5 = Dependence with institutionalization. Client meets criteria for dependence, plus related problems are so severe that they make noninstitutional living difficult. For example, constant drug use leads to disruptive behavior resulting in incarceration.

Sources of Information

Client self-report

Observations by clinician(s)

Lab tests

Collateral sources (specify):

Mother

Father

Sibling

Spouse/boyfriend/girlfriend

Child

Other relative

Friend

Landlord

Police/probation/parole officer

Other ()

(continued)

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FORM C.3. Drug Use Scale—Revised (*page 6 of 6*)

DRUG NAMES AND SLANG WORDS

Sedatives/hypnotics/anxiolytics:

"Downers," Quaalude ("ludes"), Seconal ("reds"), Valium, Xanax, Librium, barbiturates ("barbs"),
Miltown, Ativan, Dalmane, Halcion, Restoril, Klonopin, "Special K," "roofies," "tranks."

Cannabis:

Marijuana ("pot," "grass," "weed," "reefer," "smoke," "dope," "joint," "ganga," "doobie," "wacky
tobacky," "Mary Jane"), hashish ("hash"), THC.

Stimulants:

"Uppers," amphetamine, "speed," "crystal meth," Dexedrine, Ritalin, "ice," "crank," "black beauties,"
"crosses," "hearts," STP, Ecstasy ("XTC," "X-file"), MDMA, MOA, DOM, DOB.

Opiates:

Heroin ("smack," "horse," "H"), morphine, opium (laudanum, paregoric, "Dover's powder"), methadone,
Darvon, codeine, Percodan, Demerol, Dilaudid.

Cocaine:

"coke," "crack," "speedball," "freebase," "rock," "snow," "8-ball," "flake"

Hallucinogens ("psychedelics"):

LSD ("acid," "windowpane," "blotter," "microdot"), mescaline (peyote, "buttons," "cactus," "mesc"),
psilocybin (mushrooms, "shrooms," "purple passion").

Over-the-counter:

Sleeping pills, diet pills, antihistamines.

Other:

PCP ("angel dust," "boat," "hog," "love boat"), steroids, "glue," ethyl chloride, paint, inhalants, nitrous
oxide ("laughing gas"), amyl or butyl nitrate ("poppers"), White-Out, cough medicine.

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