Triple comorbidity of severe mental illness, HIV infection & alcohol abuse in a female population at a community psychiatric clinic in Cape Town: Prevalence and correlates

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DECLARATION

I, Lihtle Mawelo Beene, hereby declare that the work on which this dissertation/thesis is based is my original work (except where acknowledgements indicate otherwise) and that neither the whole work nor any part of it has been, is being, or is to be submitted for another degree in this or any other university.

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Signature: ____________________________ Signed

Date: ________________ 2016
Abstract
Introduction

Severe mental illness (SMI), Human immunodeficiency virus (HIV) infection and hazardous alcohol use are global epidemics. Each condition is independently associated with significant adverse health outcomes. The presence of two or more of these conditions in one individual may result in worse health outcomes. A key mediator of poor health outcomes are factors such as medication adherence. In resource-limited countries like South Africa, the impact of psycho-social factors may contribute further to worse health outcomes. These factors include poverty and unemployment; as well as gender. In South Africa, proportionately more women are infected with HIV than men; and they are also vulnerable to the problems of trauma and interpersonal violence. The main aim of this study was to investigate the prevalence of a triple co-morbidity of HIV infection and hazardous alcohol use in a female population living with a SMI at a community psychiatric clinic in Cape Town South Africa; and the impact of this triple comorbidity on medication adherence. Furthermore, we set out to identify demographic and clinical variables that are predictors of poor adherence to both psychotropic medication and ART where applicable.

Methods

We conducted a cross-sectional study of female patients presenting to Gugulethu psychiatric clinic over a ten-month period. Demographics and clinical variables were explored using the Alcohol Use Disorders Identification Test (AUDIT); the adapted Morisky Scale to Assess Adherence to Psychotropic Medications; and an adherence to HIV antiretroviral treatment self-assessment instrument. A descriptive analysis of the demographic and predictor variables was undertaken to explore the prevalence of concurrent HIV infection and hazardous alcohol use in out-patients with SMI; as well as to investigate whether co-morbidity is associated with poor levels of adherence to psychotropic medication, as well as antiretroviral treatment (ART) in HIV positive patients.

Results

We interviewed 127 patients, of whom 55 were HIV positive (43.3%). The overall prevalence of a triple comorbidity in this population was 7.9%. Only 20% within this triple comorbidity
group were adherent to their psychotropic medication. Out of the 10 participants with a triple comorbidity, only five were on ART. Of these 5 participants, only two were adherent. Individuals with hazardous alcohol use were less adherent to psychotropic medication compared to those without. The seven respondents in the dual diagnosis group (SMI and hazardous alcohol use) had the lowest overall psychotropic adherence levels compared to the other subgroups (0%). Furthermore, concurrent hazardous alcohol use predicted poorer levels of compliance to ART for those with HIV infection.

Conclusion

The presence of a triple diagnosis was not found to be a predictor of poorer medication adherence, compared to having one or two diagnoses. Nevertheless, there was evidence that concurrent hazardous drinking in SMI patients predicted poor compliance to both psychotropic and ART treatment regimens (for those living with HIV). These patients should be supported in future interventions to improve medication adherence and reduce hazardous drinking.

Keywords: Severe mental illness; Alcohol abuse; HIV; Adherence
Acknowledgements

1. Professor John Joska (Research supervisor)
2. Teboho Linda (Research assistant)
3. Jonathan Ipser (Statistician, Department of Psychiatry and Mental Health UCT)
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6. My family and colleagues for their ongoing encouragement and support
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Abbreviations

ART   Antiretroviral therapy
ARV   Antiretroviral
DSM   Diagnostic and statistical manual of psychiatric disorders
HIV   Human immunodeficiency virus
ICD   International Classification of Diseases
PLHIV People living with the Human Immunodeficiency virus
SMI   Severe mental illness
SU    Substance use
WHO   World Health Organisation
YDL   Years living with a disability
Chapter 1: Introduction and literature review

Background

SMI, HIV infection and alcohol abuse are global epidemics. Each are associated with significant adverse health outcomes. These disorders have complex relationships, such that each may be associated with the development or acquisition of others. Each disorder may also result in worsening of the other: alcohol may result in HIV acquisition or worsen SMI; HIV may result in SMI and aggravate alcohol abuse; and SMI may result in HIV acquisition and alcohol abuse.

Devieux et al (2007) reported the following with regards to patients living with a SMI. The patients who had a history of sexual abuse; engaging in sexual activities while high on substances; and lower cannabis use were found to be the most significant predictors of HIV sexual risk behaviours (1). Regarding SMI and alcohol abuse; one narrative review article found that low physical activity; poor diet; smoking; alcohol and substance abuse; and risky sexual behaviour are common in individuals with SMI (2). A systematic review conducted by Collins et al showed that the prevalence of HIV infection amongst people living with a chronic and persistent mental illness was between 3.1 -22.9% (3).

The presence of two or more of these abovementioned conditions in individuals is also known to occur. Where they occur in significant numbers in communities or sub-populations, a “syndemic” may exist. A syndemic is defined as the “synergistic co-occurrence of multiple epidemics and risk factors” (4). There is a paucity of data relating to the prevalence of syndemics in a South African context. The presence of two or more of these conditions may reasonably be thought to result in worse health outcomes, such as medication adherence, morbidity and even increased mortality.

A Cape Town based study conducted by Pitpitan et al found that out of the psychosocial problems they had assessed via a syndemic approach, alcohol related problems were the only factors remaining in terms of an association with HIV risk behaviour once they had
controlled for the other psychosocial factors (4). Their study highlights the significant role that alcohol use contributes to risky sexual behaviour. This finding relates well to our research question which seeks to explore this correlation.

**Definition and categorization of mental disorders**

Mental illness is commonly categorised into common mental disorders and severe mental illness. Our study will be focusing on severe mental illness only. With regards to defining and quantifying severe and persistent mental disorders, there is limited consensus in the literature (5). A definition of SMI consists generally of three criteria: Firstly, a psychiatric diagnosis according to DSM or ICD criteria; secondly duration of illness that is more than two years and thirdly disability in functioning according to measures such as the new WHO International Classification of Functioning, Disability and Health [ICF] (6). Estimates of the prevalence of people with SMI are 0.7% of the adult population (7). The literature suggests that this prevalence estimate has remained consistent over time. For the purposes of our study SMI includes Schizophrenia; Bipolar disorder; Schizoaffective disorder and severe depression with and without psychosis.

**Dual Diagnosis**

In recent times the term ‘dual diagnosis’ has been established. It is a term that relates to the co-occurrence of severe mental illness and substance use in one individual. International studies such as the European Schizophrenia Cohort Study have shown a high lifetime rate of comorbid substance dependence. The highest rate was found in the United Kingdom at 35% (8).

Globally mental illness and substance use disorders are currently the leading cause of disability, accounting for 23% of all YLD globally and 19% in Sub-Saharan Africa in 2010 (9). Predictions suggest that considerable population growth and ageing will result in
an approximately 130% increase in the burden of mental and substance use disorders in Sub-Saharan Africa by the year 2050. This estimate is predicted to translate into 45 million Years living with disability (9). The WHO states that globally, an estimated 450 million people currently suffer from a mental illness. These statistics place mental disorders, worldwide as being amongst the leading causes of ill health and disability. Despite treatment being available, only one third of people living with a mental illness ever seek help (10).

Saban and colleagues (2014) support the premise that comorbid substance use and mental disorders result in a major public health burden. These scholars also highlight that there is a scarcity of published South African data that relates to substance use and mental disorder comorbidity and its related contributing factors (11).

Substance use trends in South Africa vary across the different regions. In the Western Cape Methamphetamine is the substance for which help is often sought. On a national level, alcohol is the substance which carries the greatest risk of harm (12). Studies have consistently shown a migratory trend towards the more economically viable Provinces in South Africa, namely Gauteng Province and the Western Cape (13). These migratory patterns may thus be an additional factor to consider when assessing substance use trends in South Africa. Thus, although Methamphetamine use is highly prevalent in the Western Cape, alcohol use has far reaching public health implications and was thus chosen as the substance of focus for our study.

A local study conducted in the Western Cape found that methamphetamine use was low overall in their sample of African males and females across different drinking venues. The levels of use were even lower when men were compared to women within the sample. This finding suggests that within the female African population in the Western Cape, methamphetamine use levels are relatively low. Given that our study population consisted of African female participants, we decided to focus on alcohol use levels for the reasons stated above (14).
Gender matters

Pitpitan et al (2013) highlight the greater vulnerabilities faced by women. Women are more likely to be confronted with: food insecurity intimate partner violence; compromised mental health; substance use and childhood abuse (4). Olley et al (2004) observed that there were gender related differences to finding out about an HIV positive diagnosis. Men were found to be more likely to engage in risky sexual behaviour and substance use including alcohol (15). One study found that women with both HIV and mental illness experienced unique vulnerabilities especially in relation to being exposed to traumatic life events (16). A study conducted in Zambia concluded that alcohol use and poverty were significant risk factors for contracting HIV/AIDS amongst the group of women that they interviewed (17). In Sub-Saharan Africa 59% of people living with HIV/AIDS were women, across all age groups (18).

The literature that the researcher reviewed indicated a relative paucity of studies that looked specifically at a female population. Considering this observation and in view of the abovementioned vulnerabilities, we chose to specifically look at only female respondents for our study.

Cultural considerations

Strebel et al highlight (2006) that the associations between gender roles; gender based violence and HIV risk are “complex and culturally specific” (19). Their research findings showed that there was still a prominence of gender roles related to male dominance. However, they also found that there was a shift towards women becoming more empowered. These shifts did not translate into an increase in the extent to which negotiations around sex practices occurred between the two genders. They also placed emphasis on the need for more focused attention on “the powerful and complex intersection of gender violence, substance abuse and HIV/AIDS” (19). Van de Water et al (2016) highlighted the need to move towards a more culturally aligned approach to making psychiatric diagnosis (20). The DSM 5 has also
captured this move by adding a Culture Formulation Interview as a part of their proposed approach to conducting a psychiatric assessment (20).

**Researcher observations informing the study**

As a health care provider working at a local community clinic in Cape Town South Africa, the researcher made several casual observations. Firstly, there was an observation that there were a significant number of female patients in this outpatient setting as opposed to the inpatient setting in facilities such as Valkenberg psychiatric hospital acute wards. In such facilities, there was a predominance of male patients. Secondly it was noted that out of the eight to ten patients that were booked for the researcher each afternoon, at least one or two of these patients were also HIV positive. Thirdly it emerged that alcohol use and abuse was common amongst the patients presenting to Gugulethu psychiatric clinic.

This led the researcher to consider the plausibility of whether in general, a significant proportion of the female patients attending this clinic were suffering from a “triple diagnosis”. The researcher became increasingly interested in finding out what proportion of these female patients had a mental illness in combination with a diagnosis of HIV and significant alcohol use and abuse. What was also striking amongst these patients was that their condition was also coupled with high levels of poverty, unemployment and psychosocial distress. The researcher was interested in assessing whether social and economic factors had an impact on the likelihood of a triple diagnosis.

Significant vulnerabilities were apparent in the majority of the female patients at Gugulethu clinic. A lot of time during the interview was spent discussing the patient’s life stressors which often revolved around physical, emotional and other forms of abuse either from the spouse or their own children. There was also a lot of discussion related to unemployment and poverty. Linked to these factors was the apparent inaccessibility to a disability grant and other social grants for those who were most in need and were eligible for such benefits. Substance abuse and its repercussions was also a prominent feature during consultations.
**Triple diagnosis - Gap in the research**

For the purposes of this study, ‘triple comorbidity’ refers to the co-occurrence of mental illness, substance abuse, particularly alcohol abuse and HIV infection. The researcher of this study is unaware of any study, which investigates the prevalence and correlates of a triple diagnosis in a South African or Sub-Saharan African context. The study by Klinkenberg and Sacks (2004) that was conducted in the United States of America Missouri was a non-South African study that addressed the concept of a ‘triple comorbidity’ (16). There is an even more pronounced scarcity of data conducted in women in South Africa.

Ours is a resource-constrained setting and this group of patients represents a particularly vulnerable population with substantial needs and exposure to significant levels of stigmatisation. A South African study by Egbe et al (2014) added to the growing literature that indicates “how stigma and discrimination impacts negatively on the mental health of service users and marginalizes them from society as it inhibits their capacity to lead normal lives” (21). It is for these reasons that we set out to conduct research that would expand on the knowledge we have and gain insights into the factors that characterise the conditions of women living with a mental illness and other related comorbidities.

**Theoretical model of HIV risk behaviour among adults with SMI**
Figure 1. Theoretical model of HIV risk behaviour among adults with SMI. Solid lines represent associations between multiple domains of influence and sexual risk as identified in the study by Meade and Sikkema (2005). Dashed lines represent associations that have been reported in other studies. Dotted lines represent hypothetical associations that still need to be examined (22).

This theoretical model was developed as a component of a systematic review conducted by Meade and Sikkema. Their main area of focus was HIV risk behaviour in adults living with a SMI, and its associations. The model shows that substance abuse and psychiatric illness are both associated with increased HIV risk behaviour. A concerning conclusion from this review was the finding that many of the sexually active adults with SMI engaged in risky sexual behaviours. It is important that we gain insights into the reasons why this group of patients is particularly at risk for HIV infection. From this knowledge, appropriate interventions can then be proposed and implemented.

There is a less robust, bidirectional association between psychiatric illness and substance abuse. We propose that another element that would have implications for this model is medication adherence. We would put forward that medication adherence is a form of ‘risky behaviour’. Poor adherence to psychiatric medication may directly and indirectly impact on HIV risk behaviour. Poorly adherent people may relapse and become sexually disinhibited and more likely to engage in risky sexual practices as a part of their illness episode. We thus envisage a downward spiral of people living with an SMI, not being compliant on their medication; leading to an episode of mental illness. Such an episode being exacerbated or even triggered by concurrent substance use and abuse with the result of an increase in HIV sexual risk behaviour.

In this review, women were found to be more likely to have unprotected sex than their male counterparts. This finding is in keeping with National South African HIV statistics
which have demonstrated that there are more women who are testing HIV positive than men in our South African context (23). The outcomes of this review clearly illustrate that psychiatric illness; substance abuse; childhood abuse and cognitive behavioural factors are strongly associated with HIV risk behaviour. This has far reaching implications for both the affected individual, his/her family and the public health system in its entirety.

**Literature review**

The existing literature was searched for studies on clinic populations, where the presence of triple co-morbidity was established, together with the health outcome of medication adherence. PUBMED was searched using the following terms: mental illness; mental health; mental disorders; HIV; Human immunodeficiency virus; alcohol abuse; alcohol use disorder; substance abuse; outpatient clinic. Each term was searched separately and at the end the different search term results were combined using the advanced search option within PUBMED.

The following filters were applied: female; studies conducted less than five years ago; and adult population. There were 91 papers that were retrieved. The title and abstracts were reviewed for inclusion, using the following criteria: (i) the study used clear diagnostic or valid measures of SMI and alcohol abuse, and these were reported; (ii) the study established HIV sero-status; (iii) the study reported on self- or objective measures of medication adherence (iv) The study reported on quality of life related factors. Studies of children, persons older than 65, and in-patient populations were not included. After applying our inclusion and exclusion criteria, only five of the 91 studies were deemed appropriate and fitting for our literature review. Most of the studies were excluded for not meeting our criteria relating to measures of medication adherence. The included studies are presented in Table 1.
<table>
<thead>
<tr>
<th>Author &amp; date</th>
<th>Place &amp; setting</th>
<th>Sample size &amp; type</th>
<th>Measures used</th>
<th>Main findings</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peltzer K, 2012 (24)</td>
<td>Nationwide (SA) outpatient</td>
<td>1532 Male &amp; female, probability sample</td>
<td>AUDIT Social funct Health survey</td>
<td>Outpatients in this study did not experience a reduced quality of life related to their alcohol use compared with other attenders.</td>
<td>Surprising, one would have expected a reduced quality of life in alcohol dependent patients</td>
</tr>
<tr>
<td>Yehia BR et al (25)</td>
<td>Philadelphia, urban clinics</td>
<td>51 male &amp; female, purposive sampling</td>
<td>Semi structured interviews</td>
<td>Patients not retained in care faced more barriers. Developing care models where social and financial barriers are addressed, mental health and substance abuse treatment is integrated, and patient-friendly services are offered is important to keeping HIV-infected individuals engaged in care.</td>
<td>This study emphasised the need and importance of more integrated models of care to adequately manage PLWHA who have a mental illness and substance use problem.</td>
</tr>
<tr>
<td>Mutabazi-Mwesigire D, 2013 (26)</td>
<td>Uganda, OPD setting</td>
<td>1274 males &amp; females, random selection</td>
<td>Medical Outcomes Study (MOS-HIV) Health Survey &amp; Global Person Generated Index (GPGI)</td>
<td>Regardless of treatment status, PLHIV with depression or low education level and female gender were at risk of having a poor quality of life.</td>
<td>Study findings point towards the increased vulnerability that female patients have.</td>
</tr>
<tr>
<td>Marx KA et al 2011 (27)</td>
<td>Philadelphia, urban clinics</td>
<td>212 male &amp; female, random sample</td>
<td>Chart review</td>
<td>In the binary model, those with a history of substance use were about half as likely to be retained (OR 0.52, 95% CI 0.29-0.94) and</td>
<td>Substance use emerges as a predictor of poor retention to ARV treatment.</td>
</tr>
</tbody>
</table>
those with an AIDS diagnosis were more than twice as likely to be retained (OR 2.18, 95% CI 1.17-4.09).

<table>
<thead>
<tr>
<th>Study</th>
<th>Setting</th>
<th>Sample Size</th>
<th>Methods</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Murphy K et al 2011 (28)</td>
<td>California, two county HIV clinics</td>
<td>49 male &amp; female ID via Computerised problem lists</td>
<td>Clinician questionnaire</td>
<td>51% of whom achieved an undetectable HIV viral load. These patients tended to have less drug use, more ongoing psychiatric visits and were more apt to take psychiatric medicines. A surprising finding was that many patients were successful with HIV treatment despite substance abuse, uncontrolled psychiatric symptoms, and lack of psychiatric care.</td>
</tr>
</tbody>
</table>
It was noted that none of the studies reported on the prevalence of a triple comorbidity. This is mainly because the prevalence of a triple comorbidity was not the primary outcome measure for the abovementioned five studies. In essence, no study has been done up until now that looks at the prevalence of a triple comorbidity of HIV, SMI and alcohol abuse in a South African context. One of the studies reported an overall depression prevalence of 33% within their cohort of PLHIV, a figure which is in keeping with other similar studies (26). This figure highlights how common psychiatric comorbidity is in PLHIV. This same study quotes comorbid depression ranges between 30% and 53%. Although this study is commenting on one psychiatric disorder, the literature does support the notion that PLHIV have a higher prevalence of psychiatric comorbidity and vice versa. It has been estimated for example, that the prevalence of HIV infection in the SMI population in the United States of America ranges from 3.1 to 22.9% (29).

Regarding key health outcomes, two of the studies looked at quality of life as an outcome measure. Interestingly the study by Mutabazi-Mwesigire D. Et al (2013) found that PLHIV who also had comorbid depression or low education level and female gender were at higher risk of having a poor quality of life. They also concluded that PLHIV who were on antiretroviral treatment experienced greater quality of life. This finding holds relevance for our study. We are specifically conducting our study amongst female participants as they have been shown to have greater vulnerabilities than their male counterparts. Our study is also looking specifically at medication adherence. Based on our findings, we can begin to make inferences about the likely impact of poor versus good adherence on overall quality of life. The study by Peltzer and Pengpid (2012) found no reported reduced quality of life in alcohol dependent individuals. It is important to note though that these individuals did not have a triple comorbidity. This study was looking at alcohol using participants as their primary interest group in a general outpatient setting. On the other hand, alcohol dependence was found to be associated with compromised physical and mental health (24). This study reiterates the deleterious effect that harmful alcohol use has on the individual. This includes amongst other factors, an increase in physical and psychiatric comorbidities.

The findings by Murphy K et al were surprising in that missing clinic appointments was found to have little impact on treatment outcomes. One would have deduced that poor clinical attendance correlated with poor medication adherence and subsequently poor treatment outcomes (28).
Common barriers to care that were reported by a group of HIV positive participants included the following: dealing with other life priorities such as looking after children; being physically unwell and feeling depressed (25). This is relevant to our study which looks at women only because women are often the ones who are unequally tasked with the responsibility of rearing children. Studies have also consistently shown that women have higher rates of depression than men with a ratio of 2:1 (30).

With regards to areas needing further research, the studies in general highlighted the need for increased HIV testing for patients with a severe mental illness (28). They also emphasised the importance of developing more integrated models of care to address some of the barriers that this patient group experience.

The consensus from the above studies is that people living with any one of the three disorders we are investigating (SMI; HIV; harmful alcohol use) face greater vulnerabilities. These vulnerabilities result in poorer outcomes in measures such as quality of life assessments. Stigma is another important aspect that has been found to correlate with reduced quality of life amongst people living with an SMI such as schizophrenia (31). Medication adherence is important with regards to all three disorders. Being on ART improves health related outcomes and adherence to psychiatric medication is likely to also result in better health outcomes. Assessing levels of adherence amongst triply affected individuals versus dual diagnosis and single diagnosis participants is thus vital to assist in the appropriate planning and allocation of health care resources.

**Aims and objectives**

The main aim of this study was to investigate the prevalence of a triple co-morbidity of HIV infection and alcohol abuse in a female population living with a SMI at a community psychiatric clinic in Cape Town South Africa; and their impact on medication adherence. The presence of potential contributing variables, such as psycho-social needs in a resource limited setting was also explored.


Tables and figures

Table 1 Group comparison of demographic and clinical variables in patients with SMI

<table>
<thead>
<tr>
<th></th>
<th>HIV+/SU+ (N = 10)</th>
<th>HIV+/SU- (N = 45)</th>
<th>HIV-/SU+ (N = 7)</th>
<th>HIV-/SU- (N = 65)</th>
<th>Test</th>
<th>Fisher exact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographics: total nr with % in brackets</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>37.70 (6.67)</td>
<td>43.29 (9.64)</td>
<td>40.71 (11.67)</td>
<td>44.35 (10.12)</td>
<td>Chisq = 5.847, df = 3, p = 0.120</td>
<td>P = 0.376</td>
</tr>
<tr>
<td>Education (% completing high school)</td>
<td>0 (0%)</td>
<td>10 (22.2%)</td>
<td>1 (14.29%)</td>
<td>16 (24.62%)</td>
<td>Chisq = 3.365, df = 3, p = 0.339</td>
<td>P = 0.362</td>
</tr>
<tr>
<td>Income (% &gt; R2000 per month)</td>
<td>2 (20%)</td>
<td>20 (44.44%)</td>
<td>2 (28.57%)</td>
<td>31 (47.69%)</td>
<td>Chisq = 3.364, df = 3, p = 0.339</td>
<td>P = 0.362</td>
</tr>
<tr>
<td>Stable relationship (%)</td>
<td>8 (80%)</td>
<td>22 (48.89%)</td>
<td>6 (85.71%)</td>
<td>25 (38.46%)</td>
<td>Chisq = 10.475, df = 3, p = 0.015</td>
<td>P = 0.014</td>
</tr>
<tr>
<td>Has children (%)</td>
<td>10 (100%)</td>
<td>39 (86.67%)</td>
<td>6 (85.71%)</td>
<td>50 (76.92%)</td>
<td>Chisq = 4.143, df = 3, p = 0.246</td>
<td>P = 0.270</td>
</tr>
<tr>
<td>% employed or in school (full/part-time)</td>
<td>1 (10%)</td>
<td>7 (15.56%)</td>
<td>1 (14.29%)</td>
<td>8 (12.31%)</td>
<td>Chisq = 0.352, df = 3, p-value = 0.95</td>
<td>P = 0.966</td>
</tr>
<tr>
<td>Clinical history: Total nr with % in brackets</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multiple admissions</td>
<td>5 (50.00%)</td>
<td>16 (35.56%)</td>
<td>1 (14.29%)</td>
<td>26 (40.00%)</td>
<td>Chisq = 2.509, df = 3, p-value = 0.474</td>
<td>P = 0.508</td>
</tr>
<tr>
<td>Psychotropic med. adherence (%)</td>
<td>2 (20%)</td>
<td>20 (45.46%)</td>
<td>0 (0%)</td>
<td>35 (54.10%)</td>
<td>Chisq = 7.655, df = 3, p = 0.054</td>
<td>P = 0.045</td>
</tr>
<tr>
<td>ARV adherence (100%)</td>
<td>40.00 (2/5)</td>
<td>88.46 (23/26)</td>
<td>NA</td>
<td>NA</td>
<td>Chisq = 6.31, df = 1, p = 0.012</td>
<td>P = 0.038</td>
</tr>
<tr>
<td>Not on ARVs (%)</td>
<td>5 (50.00%)</td>
<td>19 (42.20%)</td>
<td>NA</td>
<td>NA</td>
<td>Chisq = 0.201, df = 1, p = 0.654</td>
<td>P = 0.733</td>
</tr>
</tbody>
</table>
Table 2 Association of demographic & clinical variables with psychotropic adherence

<table>
<thead>
<tr>
<th></th>
<th>Adherent (N = 50)</th>
<th>Non-adherent (N = 72)</th>
<th>Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>43.70 (10.43)</td>
<td>42.83 (9.19)</td>
<td>t = 0.474, p: 0.637</td>
</tr>
<tr>
<td>Education (% completing high school)</td>
<td>17 (34.8%)</td>
<td>9 (12.5%)</td>
<td>Chisq=8.134, p=0.004</td>
</tr>
<tr>
<td>Income (% greater than R2000 per month)</td>
<td>25 (50.00%)</td>
<td>27 (37.50%)</td>
<td>Chisq=1.855, p=0.170</td>
</tr>
<tr>
<td>Stable relationship (%)</td>
<td>16 (32%)</td>
<td>43 (59.72%)</td>
<td>Chisq =9.081, p=0.003</td>
</tr>
<tr>
<td>Has children (%)</td>
<td>37 (74%)</td>
<td>65 (90.28%)</td>
<td>Chisq =5.705, p=0.017</td>
</tr>
<tr>
<td>% employed or in school (full/part time)</td>
<td>8 (16%)</td>
<td>8 (11.1%)</td>
<td>Chisq =0.619, p=0.431</td>
</tr>
<tr>
<td>Multiple admissions (%)</td>
<td>20 (40%)</td>
<td>27 (37.2%)</td>
<td>Chisq=0.353, p=0.552</td>
</tr>
<tr>
<td>Hazardous drinking (%)</td>
<td>27 (54.29%)</td>
<td>64 (88.24%)</td>
<td>Chisq =6.972, p=0.008</td>
</tr>
<tr>
<td>100% ARV adherent*</td>
<td>15 (93.75%)</td>
<td>10 (75%)</td>
<td>Odds ratio = 7.045, p = 0.083</td>
</tr>
</tbody>
</table>

* Fishers exact test comparing proportion of 31 seropositive individuals in sample self-reporting 100% ARV compliance by psychotropic medication compliance

Table 3 Results of linear model of predictors of psychotropic adherence

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Beta coefficient</th>
<th>Std. Error</th>
<th>Z value</th>
<th>Odds ratio</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazardous drinking</td>
<td>-1.2694</td>
<td>0.8149</td>
<td>-1.558</td>
<td>0.284</td>
<td>0.119</td>
</tr>
<tr>
<td>Education (Grade 12 + tertiary)</td>
<td>1.1998</td>
<td>0.5106</td>
<td>2.350</td>
<td>3.319</td>
<td>0.019</td>
</tr>
<tr>
<td>Stable relationship</td>
<td>-1.0112</td>
<td>0.4288</td>
<td>-2.358</td>
<td>0.364</td>
<td>0.018</td>
</tr>
<tr>
<td>Has children</td>
<td>-0.6322</td>
<td>0.5606</td>
<td>-1.128</td>
<td>0.531</td>
<td>0.260</td>
</tr>
</tbody>
</table>
Figure 1

Adherence to psychotropic medication (%)
Instructions for authors

AIDS and Behavior Journal

Manuscript Submission

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Chapter 2: Publication-ready Manuscript

Triple comorbidity of severe mental illness, HIV infection & alcohol abuse in a female population at a community psychiatric clinic in Cape Town: Prevalence and correlates

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Abstract

Introduction
Severe mental illness (SMI), Human immunodeficiency virus (HIV) infection and hazardous alcohol use are global epidemics. Each condition is independently associated with significant adverse health outcomes. The presence of two or more of these conditions in one individual may result in worse health outcomes. A key mediator of poor health outcomes are factors such as medication adherence. In resource-limited countries like South Africa, the impact of psycho-social factors may contribute further to worse health outcomes. These factors include poverty and unemployment; as well as gender. In South Africa, proportionately more women are infected with HIV than men; and they are also vulnerable to the problems of trauma and interpersonal violence. The main aim of this study was to investigate the prevalence of a triple co-morbidity of HIV infection and hazardous alcohol use in a female population living with a SMI at a community psychiatric clinic in Cape Town South Africa; and the impact of this triple comorbidity on medication adherence. Furthermore, we set out to identify demographic and clinical variables that are predictors of poor adherence to both psychotropic medication and ART where applicable.

Methods
We conducted a cross-sectional study of female patients presenting to Gugulethu psychiatric clinic over a ten-month period. Demographics and clinical variables were explored using the Alcohol Use Disorders Identification Test (AUDIT); the adapted Morisky Scale to Assess Adherence to Psychotropic Medications; and an adherence to HIV antiretroviral treatment self-assessment instrument. A descriptive analysis of the demographic and predictor variables was undertaken to explore the prevalence of concurrent HIV infection and hazardous alcohol use in out-patients with SMI; as well as to investigate whether co-morbidity is associated with poor levels of adherence to psychotropic medication, as well as antiretroviral treatment (ART) in HIV positive patients.

Results
We interviewed 127 patients, of whom 55 were HIV positive (43.3%). The overall prevalence of a triple comorbidity in this population was 7.9%. Only 20% within this triple comorbidity group were adherent to their psychotropic medication. Out of the 10 participants with a triple comorbidity, only five were on ART. Of these 5 participants, only two were adherent.
Individuals with hazardous alcohol use were less adherent to psychotropic medication compared to those without. The seven respondents in the dual diagnosis group (SMI and hazardous alcohol use) had the lowest overall psychotropic adherence levels compared to the other subgroups (0%). Furthermore, concurrent hazardous alcohol use predicted poorer levels of compliance to ART for those with HIV infection.

**Conclusion**

The presence of a triple diagnosis was not found to be a predictor of poorer medication adherence, compared to having one or two diagnoses. Nevertheless, there was evidence that concurrent hazardous drinking in SMI patients predicted poor compliance to both psychotropic and ART treatment regimens (for those living with HIV). These patients should be supported in future interventions to improve medication adherence and reduce hazardous drinking.
Introduction

Sub-Saharan Africa is plagued by several converging public health challenges. These include the HIV and tuberculosis epidemics, and a significantly high burden of morbidity and mortality resulting from violence and injury. There is also a significant proportion of the population that has chronic or non-communicable diseases (1). Mental health related disorders are a growing public health concern; linked to this is the ongoing problem of substance use and abuse in South Africa (SA). In addition to these challenges, South Africa has disproportionately higher levels of maternal, neonatal, and child mortality when compared to countries with larger population numbers and fewer resources (2).

Severe versus common mental disorders

Mental disorders are commonly categorised into common mental disorders and severe mental illness. This study will be focusing on severe mental illness (SMI) only. There is limited consensus within the literature with regards to defining and quantifying severe and persistent mental disorders (3). A definition of SMI consists generally of three criteria: firstly, a psychiatric diagnosis according to DSM or ICD criteria; secondly duration of illness that is more than two years and thirdly disability in functioning according to measures such as the new World Health Organisation (WHO) International Classification of Functioning, Disability and Health [ICF] (4). Global estimates of the prevalence of people with SMI are 0.7% of the adult population (3). The literature suggests that this prevalence estimate has remained consistent over time. For the purposes of our study SMI includes Schizophrenia; Bipolar disorder; Schizoaffective disorder and severe depression with and without psychosis.

HIV

The WHO reports that 63% of all HIV-positive adults and children globally are found within Sub-Saharan Africa. This region encompasses 24.7 million adults who are infected with the virus (5). The national HIV prevalence, Incidence and Behaviour Survey of 2012 estimated that the HIV prevalence in South Africa increased from 10.6% in 2008 to 12.2% in 2012 (6). A concerning statistic found by this same survey is that the highest incidence of HIV infection is found in African females between the ages of 20 and 35 years (6) . There are a few theories with regards to explaining how and why the prevalence has continued to
increase. There are also factors that are making young African females particularly vulnerable to HIV.

**Gender matters**

Pitpitan and colleagues (2013) highlight the greater vulnerabilities faced by women. In this regard, women are more likely to be confronted with: food insecurity intimate partner violence; compromised mental health; substance use and a history of childhood abuse (7). The WHO reported that in Sub-Saharan Africa 59% of people living with HIV/AIDS are women, across all age groups (5). In a South African context, research has shown that gender power imbalances in relationships and intimate partner violence places women at an increased risk of HIV infection (8). The literature that the researcher reviewed indicated a relative paucity of studies that looked specifically at a female population. Considering this observation and in view of the above-mentioned vulnerabilities, we chose to specifically assess only female respondents for our study.

**Alcohol use**

A South African national survey conducted in 2011, reported that 9% of their study population met the criteria for hazardous alcohol use (9). Hazardous drinking is defined as: “a quantity or pattern of alcohol consumption that places patients at risk for adverse health events, while harmful drinking is defined as alcohol consumption that results in adverse events (eg, physical or psychological harm)” (10). This survey also reported that 41.5% of the men and 17.1% of the women within this study reported current alcohol use (9). The survey also noted an increase in patterns of binge drinking and harmful alcohol use over a three-year period (2005 -2008). A randomised controlled trial conducted within a general outpatient population at a South African Academic Hospital, noted that 27.6% of their participants met the AUDIT criteria for harmful alcohol use (11). The AUDIT cut off score associated with a diagnosis of an alcohol use disorder (AUD) is eight and above (10).

Kader et al conducted a South African study in an HIV positive outpatient population. They noted that 37% of their participants reported harmful or hazardous drinking (12). This trend
has been found in other non-South African studies as well. This group of participants were also found to be less likely to be on ART (12).

**Co-morbid disorders**

SMI, HIV infection and alcohol abuse are global epidemics. Each of these conditions is associated with significant adverse health outcomes. These disorders have complex relationships, such that each may be associated with the development or acquisition of others. Each disorder may also result in worsening of the other in the following manner: behavioural changes associated with heavy alcohol intake may result in HIV acquisition, or worsened SMI; HIV may result in SMI and aggravate alcohol abuse, and SMI may result in HIV acquisition and alcohol abuse. The presence of two or more of these abovementioned conditions in individuals is also known to occur. Where they occur in significant numbers in communities or sub-populations, a ‘syndemic’ may exist. A syndemic is defined as the “synergistic co-occurrence of multiple epidemics and risk factors” (7). There is a general paucity of data relating to the prevalence of syndemics in a South African context. The presence of two or more of these conditions may reasonably be thought to result in worse health outcomes, such as medication adherence, morbidity and even increased mortality. Devieux and colleagues (2007) conducted a study amongst a range of individuals with SMI. They set out to determine the most significant predictors of HIV sexual risk behaviours within this population. Their findings showed that a history of sexual abuse; engaging in sexual activities while high on substances; and lower cannabis use were the most significant predictors (13). Regarding SMI and alcohol abuse, one narrative review article found that low physical activity; poor diet; smoking; substance abuse and risky sexual behaviour are common in individuals with SMI (14).

**Implications of co-morbidity**

Each of these disorders on their own has significant implications for the affected individuals. Having all three in one individual is thus likely to have a compounded deleterious effect on a person’s health-related outcomes. Saban and colleagues (2014) support the premise that comorbid substance use and mental disorders result in a major public health burden. These scholars also highlight the fact that there is a scarcity of published South African data that relates to substance use and mental disorder comorbidity and its related contributing factors (15).
Another implication which forms the basis of this study is how these co-occurring disorders may adversely impact on adherence to both psychotropic and where applicable, antiretroviral therapy (ART). Kader et al (2015) conducted an outpatient clinic-based study in Cape Town which concluded that harmful alcohol use was a statistically significant predictor of poor ART adherence. This was in terms of both missing doses and stopping ARTs completely (16). A cohort study of HIV positive participants, conducted by Dewing and colleagues (2015) highlighted that a high percentage of their participants screened positive for either substance abuse or a mental disorder. Both substance abuse and screening positive for a mental disorder were amongst the factors which were found to be significantly associated with non-adherence to ART (17).

The South African stress and health study found that out of all the respondents who received any mental health treatment in the preceding 12 months, 54% became non-adherent to their treatment regimen. The following demographic factors were not found to be predictors of non-adherence to treatment: age; sex; marital status; education and income. The existence of a substance use disorder was associated with higher odds (OR=3.7) (p< 0.05) of dropping out of treatment (18).

**Triple comorbidity**

For the purposes of this study, ‘triple comorbidity’ refers to the co-occurrence of severe mental illness, hazardous drinking and HIV infection in an individual. The researcher is unaware of any study which investigates the prevalence and correlates of a triple diagnosis or diagnosis in a South African context. A literature review conducted by Klinkenberg and Sacks in the United States of America Missouri, was one of the few articles we found that addressed the concept of a ‘triple diagnosis’(19). These scholars highlighted that within a group of people living with a mental illness, 20% to 50% will have a comorbid substance use disorder. Conversely, 50% to 75% of people with a substance use disorder meet criteria for a psychiatric disorder. The authors go further to suggest that co-occurring disorders (substance use and a mental disorder), may be more prevalent in women living with HIV than their HIV infected male counterparts. Triply diagnosed individuals are reported to have complex needs which pose significant clinical implications (19). Globally, there is a pronounced scarcity of data conducted solely in women and this scarcity is also apparent in South Africa.
The literature we reviewed points towards a South African national prevalence of alcohol use that is at 9.2%. We used the National HIV prevalence of 12.2% as a part of our calculation. South Africa’s national population currently stands at an estimated 54 million people (20), females constitute 51% of this estimate (27.64 million). Global estimates of SMI in the general population are approximately 0.7% (3).

The above figure is a schematic representation of the three conditions that are the focus of our study. Our area of interest is the square in the middle, which represents the area where all three conditions overlap. The figures are based on the estimated national population of South Africa which currently stands at 54 million people (20). As a means of further contextualizing our findings, we looked at the specific prevalence estimates within the Western Cape. The prevalence of HIV infection in the South African National HIV survey in 2012 in the Western Cape province was 5% across both genders. Amongst women in the Western Cape, the prevalence of hazardous or harmful drinking (AUDIT score greater than or equal to 8) is 5.6% in women (9). There is no current literature that points towards the extent of this overlap. Our study set out to determine this area of overlap and thus quantify the extent of a triple comorbidity.
Hypotheses
We aim to explore the prevalence of the triple co-morbidity of HIV infection and hazardous alcohol use among female patients living with a SMI within the community psychiatric health services. We further aim to explore whether factors such as substance use and HIV infection separately predict poorer medication adherence in this group of patients. We postulate that their combination in the form of a triple diagnostic group will be particularly prognostic of poor levels of medication adherence. This includes adherence to both psychotropic medication and where applicable, ART.

Implementation Objectives
We plan to provide feedback to the management team at Gugulethu Community health care centre and similar clinic settings. Our aim is to also raise awareness amongst people living with a mental illness, regarding these three diagnoses and their implications for their overall health and wellbeing.

Methods

Study setting and procedures
We conducted a cross-sectional, descriptive and analytical survey of female patients presenting to Gugulethu community psychiatric clinic. Data collection began in February 2015 and was concluded in November 2015. Selection of participants was carried out using convenience sampling methods. Clinical attendees who were presenting for their routine follow-up visits were screened to see if they meet our inclusion criteria. This was done by the trained psychiatric nurse at the facility who usually follows up the patients on a monthly basis. The nurse assessed their mental status on the day, acutely impaired/unwell patients were not referred to the research assistant. The research assistant conducted further screening and assessment for suitability to participate in the study. We first conducted a pilot of the study amongst two participants to ascertain the time it would take to complete the administration of the questionnaires for each respondent.
Inclusion criteria comprised of all females over the age of eighteen years with a diagnosis of a SMI. A diagnosis of a SMI was confirmed via reviewing the folder information. The following participants were excluded from our study: male patients and everyone either under the age of eighteen or over the age of sixty years; patients who were actively psychotic and unable to provide informed consent; those with a primary diagnosis of dementia or intellectual disability; and patients who declined to participate.

Our review of clinic records suggested that approximately 50 patients attend the Gugulethu Psychiatric clinic per day, from Monday to Thursday. Based on the South African national population statistics we estimated that approximately 50% of these patients will be female (20). Thus, out of the fifty daily attendees, an estimated 25 will be female. This rendered a maximum sample size of 25 (females) x 3 (data collection days per week) x 4 (weeks per month) x 5 (months) =1500. At the end of our data collection time, we had a total of 140 completed questionnaires.

**Measures**

We included measures to capture demographic and clinical information, as well as some intended to clarify hazardous alcohol use and our outcome variable of interest, namely psychotropic and ART adherence. Measures were translated into IsiXhosa, the indigenous language spoken in the area and were administered by an IsiXhosa - speaking research assistant. These measures were put in place to reduce the potential for confusion in terminology and to enhance the robustness of the responses, and thus the findings of the study. The combination of questionnaires used in the study included the following:

[1] Firstly, we compiled a demographic and social data questionnaire. This included basic demographic information such as age, marital status, education level and income. Information regarding the psychiatric diagnosis was also collected via the use of this questionnaire (Appendix 2).

[2] Secondly, we used the (AUDIT) Alcohol Use Disorders Identification Test (Appendix 5): The Audit is an instrument constructed by the WHO from a cross-national study. It provides a “simple method of early detection of hazardous and harmful alcohol use in primary health care settings”(21) . Volk and colleagues (1997) demonstrated that the AUDIT provided an unbiased measure of risky alcohol drinking in a family practice centre (22). These two
questionnaires formed the basis for our predictor variables. We defined current hazardous drinking as an AUDIT score greater than or equal to 8.

In terms of our outcome measure of psychotropic and or antiretroviral treatment adherence, we used the following questionnaires:

[3] Adherence to HIV antiretroviral treatment self-assessment instrument: (Appendix 3) Adapted from Machtinger EL, Bangsberg DR. (23) Non-adherence to ARVs in the study sample was defined by answering the Adherence self-assessment tool which rated adherence on a scale of 0 to 100%. Adherence was dichotomised into those who reported 100% adherence, with the other group containing those participants who were less than 100% adherent.

[4] Adapted Morisky Scale to Assess Adherence to Psychotropic Medications (Appendix 4): The original scale was based on adherence to antihypertensive medication. Results indicated that the scale had both concurrent and predictive validity with regard to blood pressure control over a specific time frame (24). Non-adherence to psychotropic medication in the study sample was defined by answering four questions. Non-adherence was assessed in the HIV positive group (both alcohol using and non-alcohol users).

HIV status and ARV treatment status were assessed via questions within the demographic questionnaire, and are therefore self-report measures. Although serological testing was not conducted by study personnel to determine HIV status, participant folders were reviewed to assess whether there was a documented previous HIV test result.

**Ethical considerations**

Ethics approval for the study was granted by the University of Cape Town’s Faculty of Health Sciences Human Research Ethics Committee (Appendix 7). Institutional approval was granted by the Facility manager at Gugulethu CHC (Appendix 6). All the participants were counselled about the purpose of the study and written consent was obtained (Appendix 1). The study was conducted in accordance with the Declaration of Helsinki ethical principles (25).
Data analysis
R statistical computing platform (version 3.2.3) was used to conduct the analyses (26). We calculated means/medians/numbers and percentages for demographic, and clinical variables. We compared four groups stratified by HIV and substance use status on these variables by means of non-parametric Kruskal-Wallis tests or chi-squared tests for continuous and categorical data, respectively. Exact tests were employed for comparisons of ARV adherence proportions in HIV positive patients, given the small sample size for this analysis. In addition, logistic regression models were conducted to test whether group differences in adherence to psychotropic medication was robust to demographic and clinical covariates that differed between the groups.

We calculated a post hoc power estimate to detect a medium effect with the sample size that we have of 127. For a medium-sized difference in adherence rates, we would have a power estimate of 0.82. This means that if the test were to be repeated 100 times in different samples of this population, we would detect a medium or larger difference in adherence between the four groups at least 82% of the time. Chi squared power calculation: pwr. chisq. test (w=0.3, N=127, df=3, sig. level=0.05)

Results

We obtained 140 completed questionnaires that met our inclusion criteria. However, thirteen of these participants did not know their HIV status. These thirteen people were thus excluded, resulting in a total of 127 participants that formed the basis of our analysis.

Our first objective was to explore the prevalence of a triple comorbidity and we had hypothesized that there would be a high prevalence of a triple comorbidity in this population. The overall prevalence of a triple comorbidity in this population was 10 out of the total of 127 participants who knew their HIV status (7.9%). In other words, our findings showed that 7.9% of our sample met the criteria for hazardous alcohol use and were also HIV positive, in the context of having SMI.

The overall prevalence of a triple comorbidity in this population was 7.9%. The prevalence of HIV within our entire group of participants was 43.3%. The total prevalence of hazardous
alcohol use was found to be 13.4% across our entire sample of patients. The correlates of non-adherence were not the presence of a triple comorbidity as we had hypothesized. The individual correlates which were of statistical significant (p value < 0.05) were the following: hazardous drinking; level of education and relationship status.

The second part of our research question was to determine the correlates of this triple comorbidity. Table 1 is a tabulated description of our findings. We divided our sample into four subgroups based on the number of comorbidities each participant met the criteria for. The first column (HIV+/SU+) represents our main group of interest, this is the triple comorbidity group. The mean age of the 10 women within this group was 37.70 years. None of these 10 participants had completed grade 12; and only 20% had a household income greater than R2000 per month (approximately 140 US dollars). The majority were in a stable relationship (80%) and all of them had children. Only 10% were employed or pursuing their studies, in other words one participant out of the total of ten was working or studying at the time of our study. In terms of clinical variables, 50% of these participants have had more than one admission to a psychiatric facility in their lifetime. Only 20% within this group were adherent to their psychotropic medication. Out of the 10 participants with a triple comorbidity, only five were on ART (50%). Of these 5 participants, only two were adherent to their ART. Good adherence was defined by self-reports of 100% adherence on the ARV adherence questionnaire and by a psychotropic medication related dichotomous answer questionnaire.

The second group consisted of 45 individuals, consisting of women with a SMI who are HIV positive but not using alcohol in a hazardous manner (HIV+/SU-). The most significant finding within this group was the higher proportion of adherence to psychotropic medication (45.46%) when compared to the triple comorbidity group (20%). Adherence to ART was also markedly greater in this group (88.46%), when compared to the triple comorbidity group (40%).

The third group is the classic ‘dual diagnosis’ group of women with a SMI, negative HIV status and hazardous alcohol use (HIV-/SU+). This was the smallest of the four sub-groups (n=7). Demographic variables within this group were generally comparable to the participants in the other three groups. Notably, 85.71% of participants within this group were in a stable
relationship. Psychotropic medication adherence was the lowest within this group when compared to the other three subgroups (14.29%).

The last subgroup consists of the single diagnostic participants, i.e. those who only met the criteria for an SMI (HIV-/SU-). Demographic variables were generally comparable to the other three groups. Interestingly, this group had the lowest proportion of participants who were in a stable relationship when compared to the other three subgroups (38.4%). This group was found to have the highest proportion of psychotropic medication adherence (54.10%) when compared to the other three groups.
Table 2 Group comparison of demographic and clinical variables in patients with SMI

<table>
<thead>
<tr>
<th></th>
<th>HIV+/SU+ (N = 10)</th>
<th>HIV+/SU- (N = 45)</th>
<th>HIV-/SU+ (N = 7)</th>
<th>HIV-/SU- (N = 65)</th>
<th>Test</th>
<th>Fisher exact</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demographics: total nr with % in brackets</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>37.70 (6.67)</td>
<td>43.29 (9.64)</td>
<td>40.71 (11.67)</td>
<td>44.35 (10.12)</td>
<td>Chisq = 5.847, df = 3, p = 0.120</td>
<td>P = 0.376</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td>0 (0%)</td>
<td>10 (22.2%)</td>
<td>1 (14.29%)</td>
<td>16 (24.62%)</td>
<td>Chisq = 3.365, df = 3, p = 0.339</td>
<td>P = 0.362</td>
</tr>
<tr>
<td>(<strong>% completing high school</strong>)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Income (% &gt; R2000 per month)</strong></td>
<td>2 (20%)</td>
<td>20 (44.44%)</td>
<td>2 (28.57%)</td>
<td>31 (47.69%)</td>
<td>Chisq = 3.364, df = 3, p = 0.339</td>
<td>P = 0.362</td>
</tr>
<tr>
<td><strong>Stable relationship (%)</strong></td>
<td>8 (80%)</td>
<td>22 (48.89%)</td>
<td>6 (85.71%)</td>
<td>25 (38.46%)</td>
<td>Chisq = 10.475, df = 3, p = 0.015</td>
<td>P = 0.014</td>
</tr>
<tr>
<td><strong>Has children (%)</strong></td>
<td>10 (100%)</td>
<td>39 (86.67%)</td>
<td>6 (85.71%)</td>
<td>50 (76.92%)</td>
<td>Chisq = 4.143, df = 3, p = 0.246</td>
<td>P = 0.270</td>
</tr>
<tr>
<td>(<strong>% employed or in school (full/part-time)</strong></td>
<td>1 (10%)</td>
<td>7 (15.56%)</td>
<td>1 (14.29%)</td>
<td>8 (12.31%)</td>
<td>Chisq = 0.352, df = 3, p-value = 0.95</td>
<td>P = 0.966</td>
</tr>
<tr>
<td><strong>Clinical history: Total nr with % in brackets</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Multiple admissions</strong></td>
<td>5 (50.00%)</td>
<td>16 (35.56%)</td>
<td>1 (14.29%)</td>
<td>26 (40.00%)</td>
<td>Chisq = 2.509, df = 3, p-value = 0.474</td>
<td>P = 0.508</td>
</tr>
<tr>
<td><strong>Psychotropic med. adherence (%)</strong></td>
<td>2 (20%)</td>
<td>20 (45.46%)</td>
<td>0 (0%)</td>
<td>35 (54.10%)</td>
<td>Chisq = 7.655, df = 3, p = 0.054</td>
<td>P = 0.045</td>
</tr>
<tr>
<td><strong>ARV adherence (100%)</strong></td>
<td>40.00 (2/5)</td>
<td>88.46 (23/26)</td>
<td>NA</td>
<td>NA</td>
<td>Chisq = 6.31, df = 1, p = 0.012</td>
<td>P = 0.038</td>
</tr>
<tr>
<td><strong>Not on ARVs (%)</strong></td>
<td>5 (50.00%)</td>
<td>19 (42.20%)</td>
<td>NA</td>
<td>NA</td>
<td>Chisq = 0.201, df = 1, p = 0.654</td>
<td>P = 0.733</td>
</tr>
</tbody>
</table>
Non-adherence in the study sample was defined as patients either admitting that they had ever forgot to take their medications, that they were careless at times about taking their medication, that they sometimes stopped taking their medication when they felt better or when they felt worse.

Five patients were excluded from the psychotropic medication comparisons (the four who were on depot or injectable treatment and one participant who was not receiving any psychotropic treatment). A non-parametric Kruskall-Wallis test was employed for continuous covariates. The number of individuals diagnosed with Schizoaffective disorder was too small (N = 3) for statistical analysis.

**Figure 1. Bar graph comparing the four different groups by psychotropic medication compliance**

![Bar graph](image)

(Chisq = 7.655, df = 3, p = 0.054)

Figure 1 clearly illustrates that the HIV negative, non-substance using group (HIV-/SU-), had the highest level of self-reported psychotropic medication compliance (54.10%). This group was followed closely by the HIV positive non-substance using group (45.46%). The triple diagnosis group was the second most poorly adherent subgroup (20%). What emerged during the analysis was that the (HIV-/SU+) i.e. the ‘dual diagnosis group’, had the lowest self-reported level of psychotropic medication compliance (0%). It is important to note though that there were only 7 participants in this dual diagnosis group.
We subsequently tested bivariate predictors of psychotropic adherence, after excluding participants receiving injectable medication (N = 4) and those who were not receiving psychotropic medication (N = 1).

Table 2 Association of demographic & clinical variables with psychotropic adherence

<table>
<thead>
<tr>
<th></th>
<th>Adherent (N = 50)</th>
<th>Non-adherent (N = 72)</th>
<th>Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>43.70 (10.43)</td>
<td>42.83 (9.19)</td>
<td>t = 0.474, p: 0.637</td>
</tr>
<tr>
<td>Education (% completing high school)</td>
<td>17 (34.8%)</td>
<td>9 (12.5%)</td>
<td>Chisq=8.134, p=0.004</td>
</tr>
<tr>
<td>Income (% greater than R2000 per month)</td>
<td>25 (50.00%)</td>
<td>27 (37.50%)</td>
<td>Chisq =1.855, p=0.170</td>
</tr>
<tr>
<td>Stable relationship (%)</td>
<td>16 (32%)</td>
<td>43 (59.72%)</td>
<td>Chisq =9.081, p=0.003</td>
</tr>
<tr>
<td>Has children (%)</td>
<td>37 (74%)</td>
<td>65 (90.28%)</td>
<td>Chisq =5.705, p =0.017</td>
</tr>
<tr>
<td>% employed or in school (full/part time)</td>
<td>8 (16%)</td>
<td>8 (11.1%)</td>
<td>Chisq = 0.619, p = 0.431</td>
</tr>
<tr>
<td>Multiple admissions (%)</td>
<td>20 (40%)</td>
<td>27 (37.2%)</td>
<td>Chisq = 0.353, p= 0.552</td>
</tr>
<tr>
<td>Hazardous drinking (%)</td>
<td>27 (54.29%)</td>
<td>64 (88.24%)</td>
<td>Chisq = 6.972, p= 0.008</td>
</tr>
<tr>
<td>100% ARV adherent*</td>
<td>15 (93.75%)</td>
<td>10 (75%)</td>
<td>Odds ratio = 7.045, p = 0.083</td>
</tr>
</tbody>
</table>

*Fishers exact test comparing proportion of 31 seropositive individuals in sample self-reporting 100% ARV compliance by psychotropic medication compliance

As evident in Table 2, lower levels of education (not completing High School); being in a stable relationship; having children; and hazardous drinking was significantly associated with psychotropic medication non-adherence in our study sample. In other words, psychotropic medication adherent participants were more likely to have completed high school and not be in a stable relationship. They were also found to be less likely to have children when compared to the non-adherent group. They were also slightly more likely to be employed (16% versus 11.1%). The largest discrepancy between the adherent and the non-adherent group related to the extent of self-reported hazardous drinking (AUDIT score >8). The proportion of fully adherent hazardous drinkers was 54.29% compared to non-adherent hazardous drinkers (88.24%).

A Fisher’s exact test was conducted to compare the proportion of PLHIV and SMI who reported 100% ARV compliance, versus those who were not fully compliant to their ARV
regimen. It was found that 93.75% of these individuals who reported being adherent to their psychotropic medication, were also reporting full adherence to their ARVs. In comparison, only 75% of those individuals who were not fully adherent to their psychotropic medication reported full adherence to their ARVs. In other words, psychotropic adherence was associated with a higher likelihood of ARV adherence.

The third and final aspect of our study was to determine whether substance use and HIV infection separately predict poorer medication compliance. We had postulated that their combination in the form of a triple diagnostic group will be particularly prognostic of poor levels of medication adherence (both psychotropic and where applicable, ART). To identify which of these variables uniquely predicted adherence, a logistic regression model was subsequently tested. The results of this regression model are presented in Table 3.

Table 3 Results of linear model of predictors of psychotropic adherence

<table>
<thead>
<tr>
<th></th>
<th>Beta coefficient</th>
<th>Std. Error</th>
<th>Z value</th>
<th>Odds ratio</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazardous drinking</td>
<td>-1.2694</td>
<td>0.8149</td>
<td>-1.558</td>
<td>0.284</td>
<td>0.119</td>
</tr>
<tr>
<td>Education (Grade 12 + tertiary)</td>
<td>1.1998</td>
<td>0.5106</td>
<td>2.350</td>
<td>3.319</td>
<td>0.019</td>
</tr>
<tr>
<td>Stable relationship</td>
<td>-1.0112</td>
<td>0.4288</td>
<td>-2.358</td>
<td>0.364</td>
<td>0.018</td>
</tr>
<tr>
<td>Has children</td>
<td>-0.6322</td>
<td>0.5606</td>
<td>-1.128</td>
<td>0.531</td>
<td>0.260</td>
</tr>
</tbody>
</table>

From Table 3 above, it emerged that hazardous drinking did not survive as a predictor of psychotropic adherence, after adjusting for education, being in a stable relationship, and having children (p value 0.119). On the other hand, after controlling for hazardous drinking; relationship status and having children, a participant who had completed high school was 3.32 times more likely to be adherent (p value 0.019). We further noted that individuals who were married or in a long-term relationship were roughly a third as likely to be adherent, after adjusting for the other covariates. In other words, being in a stable relationship was associated with poorer psychotropic medication adherence.
Discussion

In this cross-sectional survey, we report a prevalence of a triple diagnosis in a primary care mental health clinic (SMI+ HIV+ hazardous drinking) of 7.9%. There are few studies that we can directly compare our findings to. One study conducted in a group of dually diagnosed inpatients at a New York centre noted the prevalence of a triple diagnosis to be 23% (27). Key differences between that population and ours were that the sample was predominantly male, while our study only included females. The review article conducted by Klinkenberg et al reported that within a group of people living with a mental illness, 20% to 50% will have a comorbid substance use disorder. Conversely, 50% to 75% of people with a substance use disorder meet the criteria for a psychiatric disorder (19). Their findings regarding the comorbidity range of mental illness and substance use disorders is higher that our own findings of a prevalence of 13.4%. Notably though, we mainly assessed hazardous alcohol use as opposed to all substances. Their sample consisted of men and women as opposed to our population of women only.

An interesting outcome from our analysis was in relation to the triply affected group. We had predicted that this group would have the worst outcomes in terms of medication adherence to both psychotropic medication and ART where applicable. Our findings did not support our initial hypothesis. Women with a triple comorbidity were more adherent (20%) to psychotropic medication than those with a dual diagnosis of SMI and hazardous alcohol (0%), although overall these are still low levels of adherence. One postulation for this finding is that participants who are on ART are already accustomed to taking medication.

Women in resource-limited settings such as in South Africa vulnerable to HIV infection, as well as to the psycho-social effects of poverty, gender inequality and violence. Unequal power balances related to gender have been reported to be a contributing factor in increasing HIV infection risk amongst women (8). In our sample, 55 out of the total 127 women were HIV infected (43.3%). This figure is markedly higher than the SA National HIV prevalence of 14.4% for women (6). It is also higher than the 13% HIV co-infection prevalence that was
reported in a female psychiatric inpatient population at Cecelia Makiwane Hospital (28). This figure is notably higher than the Western cape province survey prevalence for women aged 20-49, where the prevalence ranged from 17-36% (6).

A United States based review reported an HIV seroprevalence range between 4.0% to 22.9% amongst people living with an SMI (29). This range is also much less than our findings. There are several possible reasons for this high prevalence. Firstly, we conducted a cross-sectional study, we are thus unable to ascertain a temporal relationship between the different diagnoses. Thus, several these participants may primarily have been diagnosed with HIV and developed a SMI secondary to the HIV diagnosis. Secondly, in our setting HIV testing is commonly done as part of the initial medical investigations for a patient presenting with signs and symptoms of mental illness. This group may thus have had an increased likelihood of being tested for HIV due to their SMI status. In resource-rich settings, the prevalence of HIV among SMI is estimated to be more than 10 times that of the background community prevalence (29).

A Brazilian National multicentre clinic based study of assessing HIV risk behaviour found the following: patients who were married; of older age; female gender; had multiple partners and living with children or partners only and those with mild psychiatric diagnoses, were more likely to engage in risky sexual practices (30). Brazil is an appropriate country for comparison, it has a socioeconomic context that is similar to that of South Africa. Both countries are classified as ‘developing nations’(31). Anecdotally the female patients who presented for their follow-up appointments at Gugulethu psychiatric clinic, regularly reported psychosocial stress related to amongst other factors; verbal and physical abuse from their intimate partner commonly fuelled by alcohol use. One can infer that this abuse may extend to coercive methods with regards to sexual relations and consequently result in an increased risk of contracting HIV.

The classic ‘dual diagnosis’ group of patients who have both SMI and comorbid hazardous alcohol use (HIV-/SU+), was found to have the lowest overall level of self-reported psychotropic medication adherence (0%). It is important to note though that there were only 7 participants in this dual comorbidity group. Psychotropic medication adherence was found to be 20% in the triple comorbidity group. Hazardous drinking was therefore associated with poorer psychotropic medication adherence in our study. This finding is consistent with results from the literature we reviewed.
A study conducted in the USA amongst a group of 2770 HIV positive women between the year 1995 and 2006, reported that 14%–24% of those women met the criteria for hazardous drinking (32). This prevalence rate is 2 to 3 times greater than the 7.9% of women found to have a triple comorbidity in our study. However, our cohort of women all had a diagnosis of an SMI at baseline unlike those in this USA study who only had a baseline diagnosis of HIV. What this USA study highlights is the high level of hazardous drinking in a population of HIV positive females. They went on to describe the profile of these women at baseline. This group of women had a greater likelihood of being older than 40 years of age; be unemployed; not have completed high school and have higher levels of symptoms of depression. They were also more likely to smoke cigarettes and to use other substances (32). This profile is in keeping with our own findings in terms of average age, education levels and employment status.

Our study further found that HIV positive, substance using participants were more likely not to be on ARVs than their non- substance using HIV-positive counterparts. These findings are in keeping with those of Kader and colleagues (16). They screened a cohort of HIV positive participants attending HIV clinics in Cape Town for problematic substance use. Their results showed that harmful substance use (which included alcohol) was a predictor of ART non-adherence. This was subsequently associated with a reduction in CD4 count and accelerated disease progression (16). This finding of poorer ART adherence amongst substance using participants is similar to our own study results.

There were several limitations to our study. Firstly, we did not use random sampling methods. We used a combination of a sequential and convenience sampling approach. Our sampling method limits the extent to which we can generalise our findings to the general population. Convenience sampling also tends towards introducing bias into a sample (33). One manner in which this bias may manifest is in our findings. Our results may be skewed as a consequence of regular clinic attendees being the ones who are also more likely to be adherent to their treatment as opposed to non-regular attendees. Secondly, we did not have an objective measure of HIV status, relying instead on patient recall and folder review. There is a potential risk that some respondents who reported being HIV negative might have seroconverted since they last tested. The respondents could also have been in the ‘window period’ at the time of testing and thus obtained a falsely negative result on that basis. Our total sample size of 127 participants was also relatively small. This has probable implications for the power of our study (34). Thirdly, we relied on self-reported medication adherence,
rather than an objective measure. This method is likely an under-estimate of non-adherence. Self-report measures are prone to recall bias and are influenced by “social desirability” (35). Despite these limitations, we propose that our findings meaningfully add to the existing literature relating to our initial research question.

**Conclusion**

In this study, we were not able to confirm that female SMI patients with dual comorbidities of hazardous alcohol use and HIV infection, are less adherent than SMI patients who are either HIV positive or who use alcohol in a hazardous manner. Instead, our findings suggest that hazardous drinking on its own is a risk factor for poorer psychotropic and HIV medication adherence in this SMI population.

We thus recommend that an emphasis should be placed on integrated substance abuse and mental health programmes at a primary care level. Future studies should consider focusing on the causal nature of the relationship between substance use and treatment adherence for both psychotropic and ARV interventions in patients with SMIs.

In principle, brief interventions; training in motivational interviewing and access to out-patient alcohol rehabilitation are critical to the holistic care of patients living with a SMI. These programmes should also include providing information to patients with a SMI about their increased risk of both HIV infection and substance abuse. A systematic review assessing HIV/Alcohol risk reduction strategies in Sub-Saharan Africa, concluded with the recommendation that alcohol risk reduction strategies need to be integrated into current HIV prevention programmes (36). The high prevalence of HIV co-infection in our SMI population, supports the necessity of offering voluntary counselling and testing for HIV in people living with a severe mental illness on a regular basis. Potential and actual barriers to accessing care should also be addressed as these barriers impact on levels of medication adherence amongst outpatient populations.
Appendices

Appendix 1

PARTICIPANT INFORMATION LEAFLET AND CONSENT FORM

PRINCIPAL INVESTIGATOR: Dr Lihle Mgweba
CONTACT NUMBER: 021-370 1111
ADDRESS: Valkenberg Hospital, Observatory Road, Observatory Cape Town 7925
SUPERVISOR: Professor John Joska

You are being interviewed today in order to find out if you have any alcohol related problems and other social problems which may affect your health. This is part of the care you receive at this clinic. We would like to use the information you give us to study the problems that people with a serious mental illness might have. It will be kept private and not linked to your name. We plan to speak to female patients who have a diagnosis of a serious mental illness. You should feel free not to answer any question you are uncomfortable with. We would like you to sign this page to say that you allow us to use this information, but you are free NOT to. This will not affect your care and treatment in any way. It remains between you and the interviewer.

This study received approval by the Research Ethics Committee of the Faculty of Health Sciences of the University of Cape Town.

Please answer the questions as honestly as possible. If it is found that you have an alcohol problem, the researcher will arrange for you to have any treatment you need, and arrange a referral to a rehabilitation centre where appropriate. This will help you in your overall treatment. Some people may be asked to go to a special clinic for treatment if they have a complicated problem. We will discuss this with you if it happens.

yokuba singathetha nawe kodwa ukuba awufuni ungalalonto ayizukutshintsha indlela ophathwa ngayo apha eclinic.Ukungavumi kwakho kuyakuhlala phakathi kwakho nalomntu ebezakubuza lemibuzo.


**Patient:** “I understand what this interview is about and agree that the information may be used to study alcohol related and other problems in people with HIV and mental illness”

**Isigulane:** “Ndiyayiqonda ukuba yemibuzo ndizakuyibuza imayelane nantoni kwaye ndiyavuma ukuba isetyenziswe ukufunda ngabantu abanengxaki notywala nezinye ingxaki ezidibene nokuphazamiseka ngokwengqondo nesifo sengculaza”

Signed at (place) ……………………………………………….. on (date) ………………….20__.

.......................................................... ..........................................................

Signature of participant Signature of witness

**Investigator/nurse/counsellor:** “I have explained this study to the patient in a way that they understand and allowed them to ask questions”

I (name) …………………………………………………………. declare that:

.......................................................... ..........................................................

Signature of investigator Signature of witness
Appendix 2
Demographics

a) Today’s Date ____________ (mo/day/4-digit year)

b) Date of Birth _____/____/____ (mo/day/4-digit year)

1. Age (in years) at point of interview ______________

Please tick the appropriate box or boxes

2. Province of origin (where were you born?)
   1. ☐ Eastern Cape
   2. ☐ Western Cape
   3. ☐ Kwazulu Natal
   4. ☐ Gauteng
   5. ☐ Other, please specify ______________

3. Education Level
   Please indicate your highest or current education level
   1. ☐ Below grade three (Standard one)
   2. ☐ Partial primary school (Grade four to seven/Standard two to five)
   3. ☐ Partial high school
   4. ☐ Passed Matric
   5. ☐ Partial college/University
   6. ☐ College/University graduate

4. Finances – What is the estimated total monthly income in your household
   1. ☐ Less than R500
   2. ☐ R501 – R1500
   4. ☐ R2001 – R3000
   5. ☐ R3001 – R5000
   6. ☐ More than R5000

5. Relationship Status
   1. ☐ Married or living with someone as if married
   2. ☐ Non-cohabiting relationship (in a relationship but we do not live together)
   3. ☐ Single
   4. ☐ Divorced or separated
   5. ☐ Loss of long-term partner/widowed

6. Do you have children?
0. ☐ No
1. ☐ Yes
   If YES, number of children: ___________

7. Please indicate who (if anyone) you live with (you may check more than one box)
   1. ☐ Self
   2. ☐ Partner/Spouse
   3. ☐ Extended family
   4. ☐ Children
   5. ☐ Group home / residential treatment
   6. ☐ Other- Please specify: ___________________

8. Work /School: Please check all that apply to you:
   1. ☐ Full time work
   2. ☐ Part time work
   3. ☐ Full or part time in school
   4. ☐ Neither work nor in school
   5. ☐ On disability
   6. ☐ Other- Please specify: ___________________

9. Do you know your HIV status?
   1. ☐ Yes
   2. ☐ No

10. Are you on ARVS
    1. ☐ Yes
    2. ☐ No
    3. ☐ Not applicable

11. What is your diagnosis (mental illness)
    1. ☐ Schizophrenia
    2. ☐ Major depressive disorder
    3. ☐ Schizoaffective disorder
    4. ☐ Bipolar disorder
    5. ☐ I do not know
    6. ☐ Other, please specify______________

12. How many admissions have you had to a psychiatric hospital?
    1. ☐ None
    2. ☐ One
    3. ☐ Two
    4. ☐ Three to Six
    5. ☐ Seven to Ten
6. □ More than Ten

13. Which of the following substances have you used on more than one occasion in the past:
   1. □ Cigarettes/tobacco
   2. □ Alcohol
   3. □ Cannabis
   4. □ Methamphetamine (tik)
   5. □ Mandrax
   6. □ Other, please specify__________________

14. Which of the following substances are you currently using (used within the last week):
   1. □ Cigarettes/tobacco
   2. □ Alcohol
   3. □ Cannabis
   4. □ Methamphetamine (tik)
   5. □ Mandrax
   6. □ Other, please specify__________________
Appendix 3

**Adherence Self Assessment Instrument**

**Instructions for Patient:** Put an "X" on the line below at the point showing your best guess about how much of each drug you have taken in the last 3 to 4 weeks.

- 0% means you have taken none of the drug
- 50% means you have taken half of the drug
- 100% means you have taken every single dose of the drug

<table>
<thead>
<tr>
<th>DRUG A:</th>
<th>0%</th>
<th>10%</th>
<th>20%</th>
<th>30%</th>
<th>40%</th>
<th>50%</th>
<th>60%</th>
<th>70%</th>
<th>80%</th>
<th>90%</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRUG B:</td>
<td>0%</td>
<td>10%</td>
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<td>DRUG D:</td>
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</tr>
</tbody>
</table>

Adapted from Machtinger EL, Bansberg DR. *Adherence to HIV Antiretroviral Therapy*. HIV InSite, May 2005. Available online at hivinsite.ucsf.edu.
Appendix 4

Morisky Scale to Assess Adherence to Psychotropic Medications: Dichotomous Response Options (Modified)

<table>
<thead>
<tr>
<th>Subjects were asked:</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Thinking about the medications PRESCRIBED to you by your doctor(s), please answer the following questions.&quot;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question</th>
<th>NO</th>
<th>YES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you ever forget to take your medications?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are you careless at times about taking your medications?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>When you feel better, do you sometimes stop taking your medications?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sometimes if you feel worse when you take your medications, do you stop taking them?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Appendix 5

AUDIT questionnaire: screen for alcohol misuse

1. How often do you have a drink containing alcohol?
   - Never
   - Monthly or less
   - 2-4 times a month
   - 2-3 times a week
   - 4 or more times a week

2. How many standard drinks containing alcohol do you have on a typical day when drinking?
   - 1 or 2
   - 3 or 4
   - 5 or 6
   - 7 to 9
   - 10 or more

3. How often do you have six or more drinks on one occasion?
   - Never
   - Less than monthly
   - Monthly
   - Weekly
   - Daily or almost daily

4. During the past year, how often have you found that you were not able to stop drinking once you had started?
   - Never
   - Less than monthly
   - Monthly
   - Weekly
   - Daily or almost daily

5. During the past year, how often have you failed to do what was normally expected of you because of drinking?
   - Never
   - Less than monthly
   - Monthly
   - Weekly
   - Daily or almost daily

6. During the past year, how often have you needed a drink in the morning to get yourself going after a heavy drinking session?
   - Never
   - Less than monthly
   - Monthly
   - Weekly
   - Daily or almost daily

7. During the past year, how often have you had a feeling of guilt or remorse after
drinking?
· Never
· Less than monthly
· Monthly
· Weekly
· Daily or almost daily

8. During the past year, have you been unable to remember what happened the night before because you had been drinking?
· Never
· Less than monthly
· Monthly
· Weekly
· Daily or almost daily

9. Have you or someone else been injured as a result of your drinking?
· No
· Yes, but not in the past year
· Yes, during the past year

10. Has a relative or friend, doctor or other health worker been concerned about your drinking or suggested you cut down?
· No
· Yes, but not in the past year
· Yes, during the past year

Scoring the audit
Scores for each question range from 0 to 4, with the first response for each question (eg never) scoring 0, the second (eg less than monthly) scoring 1, the third (eg monthly) scoring 2, the fourth (eg weekly) scoring 3, and the last response (eg. daily or almost daily) scoring 4. For questions 9 and 10, which only have three responses, the scoring is 0, 2 and 4 (from left to right).
A score of 8 or more is associated with harmful or hazardous drinking, a score of 13 or more in women, and 15 or more in men, is likely to indicate alcohol dependence.
**THE AUDIT**

<table>
<thead>
<tr>
<th>A1. Usisela kangaphi isiselo esinxilisayo?</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Andizange</td>
</tr>
<tr>
<td>□ 4 okanye ngaphezulu ngeveki</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A2. Zingaphi iziselo oziselayo ezinxilisayo ngosuku nje olulodwa xa uziselela?</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ 1 okanye 2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A3. Ingaba ukhe uthababathe iziselo ezithandathu okanye nangaphezulu ngelixi elinye?</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Andizange</td>
</tr>
<tr>
<td>□ Yonk’ imihla okanye phantse yonk’ imihla</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A4. Ingaba kukangaphi kulu nyaka uphelileyo ufumanise ukuba awukwazi ukuyeka ukusela xa sele uqalile?</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Andizange</td>
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<tr>
<td>□ Yonk’ imihla okanye phantse yonk’ imihla</td>
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</tbody>
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<thead>
<tr>
<th>A5. Ingaba kukangaphi kulu nyaka uphelileyo ufumanise ukuba awuphumeleli ekwenzeni izinto omele okanye ekulingeleke ukuba uyazenza kodwa ungakwazi ngenxa yokusela kwakho?</th>
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</thead>
<tbody>
<tr>
<td>□ Andizange</td>
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<tr>
<td>□ Yonk’ imihla okanye phantse yonk’ imihla</td>
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</tbody>
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<tr>
<th>A6. Ingaba kukangaphi kulu nyaka uphelileyo ufumanise ukuba ufuna utywa la ukuze uqale usuku lakho emveni kosuku olunjima lentselo?</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Andizange</td>
</tr>
<tr>
<td>□ Yonk’ imihla okanye phantse yonk’ imihla</td>
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</tbody>
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<thead>
<tr>
<th>A7. Ingaba kukangaphi kulu nyaka uphelileyo ufumanise ukuba uziva unesazela okanye umvandedwa emva kokuba usele?</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Andizange</td>
</tr>
<tr>
<td>□ Yonk’ imihla okanye phantse yonk’ imihla</td>
</tr>
</tbody>
</table>
A8. Ingaba kukangaphi kulo nyaka uphelileyo ufumanise ukuba awukwazi ukukhumbula into ibiyenzekile ngobusuku obudlulileyo ngenxa yokusela kwakho?

- Andizange
- Andikhange kulenyanga iphelileyo
- Ngenyanga
- Ngeveki
- Yonk’ imihla okanye phantse yonk’ imihla

A9. Ingaba wakha wonzakala okanye kwabakho ubani othe wonzakala ngenxa yokusela kwakho?

- Andizange
- Andikhange kulenyanga iphelileyo
- Ngenyanga
- Ngeveki
- Yonk’ imihla okanye phantse yonk’ imihla

A10. Ingaba isizalwane okanye isihlobo, okanye ugqirha okanye omnye umntu wezempilo bakha bakhathazeka kukusela kwakho okanye bacela ukhe uthothise izinga lokusela?

- Hayi
- Ewe, kodwa hayi lo nyaka nje
- Ewe kulo nyaka

<table>
<thead>
<tr>
<th>320</th>
<th>Kwezi nyanga ziyi 12 zidlulileyo, ingaba ukhe wathabatha iziyobisi ezingezine ngaphandle kotywala, ukuze uzive ungcono okanye utshintshe indlela oziva ngayo?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ewe</td>
<td>Hayi</td>
</tr>
</tbody>
</table>

**UKUBA NGU EWE**, nceda *cacisa* ukuba zeziphi iziyobisis obukhe wazisebenzisa

- Marijuana (intsangu, weed, ganja, umya)
- Cocaine (mandrax, pills)
- Inhalants (glue, poppers, ebenzine, epetroli)
- Narcotics (heroin, morphine, opium)
- Stimulants (speed, ecstasy, “8-hour pills”)
- Sleeping, stress pills, depression pills
- Other
To whom it may concern,

Project title: the prevalence and correlates of a triple comorbidity of severe mental illness, HIV infection and alcohol abuse in a female population at a local psychiatric clinic in Cape Town.

Please note that Masters Candidate – L Mgweba collected data for the above mentioned project from February 2015 and completed data collection in October 2015. She has completed her data collection.

Yours Sincerely

JM Morgan
MBChB, DCH, DA, FCFP, MMed Fam Med
Family Physician
Gugulethu CHC
31 October 2014

HREC REF: 666/2014

Prof J Jaske
Psychiatry & Mental Health
J Block

Dear Prof Jaske

PROJECT TITLE: THE PREVALENCE AND CORRELATES OF A TRIPLE COMORBIDITY OF SEVERE MENTAL ILLNESS, HIV INFECTION & ALCOHOL ABUSE IN A FEMALE POPULATION AT A LOCAL PSYCHIATRIC CLINIC IN CAPE TOWN (Masters Candidate - L Mgwbe)

Thank you for submitting your study to the Faculty of Health Sciences Human Research Ethics Committee for review.

It is a pleasure to inform you that the HREC has正式批准 the above-mentioned study.

Please refer to the correct name for the UCT Faculty of Health Sciences Human Research Ethics Committee (HREC) throughout the informed consent document.

In addition, please add the contact details of the HREC to the informed consent document, together with a statement that participants may contact the HREC if they have any questions or concerns about their rights or welfare as research participants.

Approval is granted for one year until the 30th November 2015.

Please submit a progress form, using the standardised Annual Report Form if the study continues beyond the approval period. Please submit a Standard Closure Form if the study is completed within the approval period.

Please quote the HREC REF in all your correspondence.

We acknowledge that the student, Lihle Mgwbe also be involved in this study.

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

Yours sincerely

[Signature]

PROFESSOR H BLOCKHAN
CHAIRPERSON, THE HUMAN RESEARCH ETHICS COMMITTEE

Federal Wide Assurance Number: FWA00001637.

HREC 666/2014
References


