Common mental and substance use disorders among people seeking HIV testing

by

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Declaration

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Abstract

The baseline prevalence of common mental disorders (CMDs) and symptoms of distress, depression, anxiety and hazardous alcohol use prior to the receipt of a HIV diagnosis is unknown. The primary aim of this research was to determine the prevalence of CMDs, such as major depression, persistent depressive disorder, generalized anxiety, and alcohol use disorders among a sample of people seeking HIV testing. The second aim was to determine the extent of general distress among the sample of HIV test seekers. The third aim of the study was to determine the ability of the Hopkins Symptom Checklist (HSCL), Beck Depression Inventory (BDI), Beck Anxiety Inventory (BAI) and the Alcohol Use Disorder Identification Test (AUDIT) to discriminate between CMD caseness and non-caseness.

Utilizing a cross-sectional design, 500 participants were recruited while seeking HIV testing at five non-medical testing sites in the Western Cape, South Africa. The research version of the Structured Clinical Interview for the DSM-5 (SCID-RV) was administered to assess the CMDs. Furthermore, the extent of distress, depression, anxiety and hazardous alcohol use was assessed using the HSCL-25, BDI, BAI, and AUDIT, respectively. Descriptive statistics were used to evaluate the prevalence of CMDs and receiver operating characteristic (ROC) curve analysis was used to determine the effectiveness of the screening instruments in predicting CMD caseness against the SCID as gold standard.

The results demonstrated that 28.4% (95% CI [24.45, 32.35]) of the sample had at least one common mental disorder. Elevated prevalence rates for major depression (14.4%; 95% CI [11.32, 17.48]), persistent depressive disorder (7.2%; 95% CI [4.93, 9.47]), generalized anxiety disorder (3.4%; 95% CI [1.81%, 4.99%]) and alcohol use disorder (19.6%; 95% CI [16.12, 23.08]) were reported. The results further showed that the HSCL-25, BDI, BAI, and the AUDIT were effective in

identifying CMD caseness. Even the subscales of the HSCL-25 were successful in detecting most of the cases of depression (MDD, and PDD) and generalized anxiety. Of the sample, 41.2% were psychologically distressed, while 21% had moderate depression, 13.6% had moderate anxiety and 34.6% reported hazardous alcohol use.

The findings of the research indicated that it is important to screen people for CMDs and distress prior to communicating an HIV diagnosis as these disorders may have a negative impact on quality of life and adherence to ART. A further contribution of the study is that the screening instruments may be used as proxies in identifying people seeking HIV testing with a CMD. Given that HIV testing and mental health services are available independently, fragmented services are provided in public health facilities in South Africa. Future research may need to focus on the integration of referral trajectories with routine screening and HIV testing.

Opsomming

Die basislynvoorkoms van algemene geessteurings en simptome van depressie, angs en gevaarlike alkoholgebruik voor die ontvangs van 'n MIV-positiewe diagnose is nie bekend nie. Die primêre doelstelling van hierdie navorsing was om die voorkoms van algemene geessteurings te bepaal onder 'n steekproef van mense wat MIV-toetsing aanvra met insluiting van depressiewe versteuring, aanhoudende depressiewe versteuring, algemene angsversteuring, en alkoholgebruikversteuring. Die tweede doelstelling was om die vlakke van sielkundige nood onder mense wat 'n MIV-toets aanvra, te bepaal. Die derde doelstelling van die studie was om die effektiwiteit van die 'Hopkins Symptom Checklist (HSCL)', 'Beck Depression Inventory (BDI)', 'Beck Anxiety Inventory (BAI)' en die 'Alcohol Use Disorder Identification Test (AUDIT)' in die bepaling van algemene geestesiekte 'gevalmatigheid' en 'nie-gevalmatigheid' te ondersoek.

Die navorsing het 'n deursneenavorsingsontwerp gebruik. Vyfhonderd deelnemers is gewerf ten tyde van aanmelding vir MIV-toetsing by vyf nie-mediese toetsplekke in die Wes-Kaap, Suid-Afrika. Die navorsingsweergawe van die gestruktureerde kliniese onderhoud vir die DSM-5 (SCID-5), is gebruik om algemene geestessteurings te assesseer. Verder is die vlakke van sielkundige nood, depressie, angs en gevaarlike alkoholgebruik bepaal met behulp van onderskeidelik die HSCL-25, BDI, BAI en AUDIT. Beskrywende statistiek is gebruik om die voorkoms van algemene geessteurings te bepaal en 'Ontvanger bedryfseienskapkurwe' (OBE – ROC) analise is gebruik om die doeltreffendheid van die self-rapporteringsinstrumente te bepaal in die voorspelling van algemene geessteuring 'caseness' teen die SCID as goudstandaard.

Die resultate het getoon dat ten minste 28.4% (95% vertrouensinterval (VI) [24.45, 32.35]) van die steekproef 'n algemene geessteuring het. 'n Verhoogde voorkoms van depressie (14.4%; 95% VI [11.32, 17.48]), aanhoudende depressie (7.2%; 95% VI [4.93, 9.47]), algemene

angsversteuring (3.4%; 95% VI [1.81%, 4.99%]) en alkoholgebruikversteuring (19.6%; 95% VI [16.12, 23.08]) is aangemeld. Die resultate het verder getoon dat die HSCL-25, BDI, BAI, en die AUDIT effektief was vir die identifisering van gemeenskaplike geessteuring 'caseness'. Selfs die subskale van die HSCL-25 was suksesvol met die opsporing van depressie (MDD en PDD), en algemene angs. Van die steekproef het 41.2% van die deelnemers sielkundige nood gehad, terwyl 21% matige depressie, 13.6% matige angs en 34.6% gevaarlike alkoholgebruik gehad het.

Die bevindinge van die navorsing het aangedui dat dit belangrik is om mense vir algemene geessteurings en sielkundige nood te toets voor die bekendmaking van hulle MIV-diagnose, aangesien hierdie versteurings 'n negatiewe invloed op lewensgehalte en die nakoming van ARB kan hê. 'n Verdere bydrae van die studie is dat die graderingsinstrumente gebruik mag word vir die identifisering van mense met 'n hoe risiko vir algemene geessteurings wat MIV-toetsing ondergaan. Gegewe dat MIV-toetsing en geestesgesondheidsdienste onafhanklik is van mekaar, verskaf openbare gesondheidsfasiliteite in Suid-Afrika gefragmenteerde dienste. Toekomstige navorsing mag nodig wees om te fokus op die integrasie van verwysingstrajekte met roetine sifting en MIV-toetsing.

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List of Abbreviations

AIDS	Acquired immune deficiency syndrome
ART	Antiretroviral therapy
AUC	Area under the curve
AUD	Alcohol use disorder
AUDIT	Alcohol use disorders identification test
BDI	Beck depression inventory
BAI	Beck anxiety inventory
CAGE	Cut down, annoy, guilty and eye-opener index
CBT-AD	Cognitive behavioural therapy for adherence and depression
CES-D	Center for epidemiological studies depression scale
CIDI	Composite international diagnostic interview
CIS	Clinical interview schedule
CMD	Common mental disorder
CPRS	Comprehensive psychopathological rating scale
DALYs	Disability adjusted life years
DSM 5	Diagnostic and Statistical Manual of Mental Disorders
DT	Distress thermometer
DTTC	Desmond Tutu TB Centre

EPDS	Edinburg postnatal depression scale
GAD	Generalized anxiety disorder
GHQ	General health questionnaire
HADS	Hospital anxiety and depression scale
HIC	High income countries
HIV	Human immunodeficiency virus
HREC	Health research ethics committee
HSCL-25	Hopkins symptom checklist-25
K-10	Kessler mental distress scale
LMIC	Low- and middle-income countries
MDD	Major depressive disorder
PAS	Psychiatric assessment schedule
PDD	Persistent depressive disorder
PHQ	Patient health questionnaire
PPV	Positive predictive value
PLWH	People living with HIV
PSE	Present state examination
MHI	Mental health inventory
MI	Multiple imputation

MINI	Mini international neuropsychiatric interview
MSM	Men having sex with men
NCS-R	National comorbidity survey replication
NGO	Non-profit organizations
NPV	Negative predictive value
NSMHW	Nigerian survey of mental health and well-being
ROC	Receiver operating characteristic curve analysis
SASH	South African stress and health
SCAN	Schedules for clinical assessment in neuropsychiatry
SCID	Structured clinical interview for the DSM 5
SES	Socioeconomic status
SPSS	Statistical Package for the Social Sciences
SRQ	Self-reporting questionnaire
SSA	Sub-Saharan Africa
TB	Tuberculosis
TGW	Transgendered women
UK	United Kingdom
USA	United States of America
VCT	Voluntary counselling and testing facility

WHO   World Health Organization

WMH   World Mental Health

Glossary

Caseness	The extent to which a person meets or does not meet the diagnostic criteria for a certain condition.
Common mental disorder	Non-psychotic mental disorders experienced by individuals in the general population, including depression and anxiety
Lifetime prevalence	The individual has the condition or disorder at any time during their life.
Negative predictive value	The proportion of people who scored below the optimal cut-off point on a screening instrument who truly do not have the condition or illness.
Psychiatric nosology	Nosology refers to the classification of mental and behavioural disorders and can be used to help understand the prevalence of disorders.
Optimal cut-off point	The best cut-off point that can discriminate between whether an individual has a specific condition or not.
Period prevalence	The individual has the condition or illness at any time during a period of time.
Point prevalence	The individual has the disorder at a specific point in time.
Positive predictive value	The proportion of people who scored below the optimal cut-off point on a screening instrument who truly do have the condition or illness.

Psychological distress   A non-pathological mental health condition that is qualitatively and
                            quantitatively different from a psychiatric disorder.

ROC analysis   Displays a curve that shows all likely cut-off points that can yield
                            sensitivity and specificity values.

Screening   A recommended way to identify people with psychiatric morbidity
                            that would normally go unrecognized and untreated.

Sensitivity   The ability of a test to correctly identify individuals with a disease
                            or illness.

Specificity   The ability of a test to correctly identify individuals without a
                            disease or illness.

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Chapter 1: Introduction

This research aimed to determine the prevalence of common mental and substance use disorders among adult men and women seeking testing for the human immunodeficiency virus (HIV) in the Western Cape, South Africa. A second aim is to examine the level of general distress among this sample of HIV test-seekers. A third aim is to determine the effectiveness of specific self-report measures in determining caseness for psychological disorders using the Structured Clinical Interview for the DSM (SCID) as a gold standard.

Common mental disorders

Common mental disorders (CMDs) refer to non-psychotic psychiatric disorders in the general population (Tomson & Shiers, 2003). This term was coined by Goldberg and Huxley (1992) to describe "disorders which are commonly encountered in community settings, and whose occurrence signals a breakdown in normal functioning" (pp. 7-8). These include depressive, anxiety and post-traumatic stress disorders (PTSD), all of which cause significant morbidity and disability in primary care settings (Patel & Kleinman, 2003). CMDs have been shown to negatively affect a wide range of health, economic and social outcomes (Moussavi et al., 2007). Comorbidity, which refers to the occurrence of more than one disorder simultaneously (Maj, 2005), accounts for a significant percentage of mental disorder cases. For example, in the US National Comorbidity Survey Replication, which is a nationally representative study, the WHM-CIDI was used to determine the extent of comorbidity of 12-month DSM-IV anxiety, mood, impulse control, and substance disorders (Kessler, Chiu, Demler, & Walters, 2005). In the NSC-R, comorbidity accounted for more than 40% of the 12-month DSM-IV disorder cases (Kessler et al., 2005).

Mental and behavioural disorders represent 183.9 million disability-adjusted life years (DALYs) around the globe (Whiteford et al., 2013). The DALY is a measure of the burden of disease and is an assessment of the number of years lost to disability, illness or death (Whiteford et al., 2013). In general, mental and behavioural disorders account for 7.4% of the global burden of disease (Murray et al., 2012; Whiteford et al., 2013). According to Murray et al. (2012), the following mental disorders contributed to more than 15 million DALYs in 2010: major depressive disorders (2.5%), anxiety disorders (1.1%), drug use disorders (0.8%), alcohol use disorders (0.7%), and schizophrenia (0.6%). In sub-Saharan Africa, mental disorders contribute to 3.1% of DALYs (Lopez, Mathers, Ezzati, Jamison, & Murray, 2006). In South Africa, specifically, the 12-month prevalence of DSM-IV mental disorders was found to be 16.5% (Williams, et al., 2008). Williams et al. (2008) also found that 28% of their sample with a severe or moderately severe mental disorder received treatment, compared to 24.4% of those with mild cases. The most common treatment for depression includes antidepressants or psychological interventions such as cognitive-behavioural therapy and interpersonal therapies (Patel et al., 2007). Alcohol dependence can be treated effectively with pharmacological tools such as acamprosate, which lessens the frequency of drinking, and psychosocial interventions (Patel et al., 2007). Cognitive behavioural therapy has been effective in the treatment of anxiety disorders (Patel et al., 2007). Furthermore, the burden of CMDs in South Africa relates to stressors such as gender inequality, poverty, unemployment, conflict, high rates of HIV and AIDS (Stein et al., 2008; Hirschowitz & Orkin, 1997; Dunkle et al., 2004; Patel & Kleinman, 2003). Evidence suggests that gender, specifically the stressors that women experience, are linked to poverty (Patel & Kleinman, 2003). Compared to men, women may have less access to education, experience intimate partner violence, and have fewer job opportunities, which are subsequently associated with CMDs (Patel & Kleinman, 2003). For

example, in a population-based study of 2 494 women aged between 18 and 50 years, poorer women were found to suffer from difficult life events, have less job opportunities, and to have chronic illnesses (Patel, Kirkwood, Pednekar, Weiss, & Mabey, 2006).

Common mental disorders and HIV

Globally, it has been estimated that nearly 36.7 million people were living with HIV in 2015 (WHO, 2015). In Sub-Saharan Africa, the HIV prevalence was 4.4% in 2015, which accounts for nearly 70% of the people living with HIV globally (WHO, 2015). Moreover, in 2015 the estimated prevalence of HIV in South Africa was 11.2% (Statistics South Africa, 2015). The challenges related to HIV include stigma, loss of employment, and mortality (Simbayi et al., 2007). HIV testing has become readily available in South Africa. The most frequently used HIV test is the Rapid test, in a person's blood is tested in a small disposable container using an aseptic technique (Mkhulisi, 2010). The person usually receives the test result in about two minutes. If positive, more blood is drawn and a confirmatory test is run (the ELISA test). In this case, the test results are usually available in about seven days (Mkhulisi, 2010).

The major determinants for HIV testing include gender, age, education level, HIV status and marital status (Ziraba et al., 2011). Ziraba et al. (2011) for instance claim that there is evidence that women are in contact with the health care system more than men (Ziraba et al., 2011). Consequently, more women than men would be willing to have a HIV test. Mayston et al. (2016) further report that CMDs were related to increased odds of a delay of more than a month in testing for HIV.

Several studies (for example by Clucas, Sibley, Harding, Liu, Catalan, & Sherr, 2011; and Sherr, Clucas, Harding, Sibley, & Catalan, 2011) have suggested that disorders such as depression

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and anxiety can be diagnosed prior to an HIV infection, but can also follow an HIV diagnosis. Furthermore, CMDs can result in high risk behaviour, for example, unprotected sex, multiple sex partners, and contracting sexually transmitted diseases, which increase the risk of contracting HIV (Sterk, Theall, & Elifson, 2006; Hutton, Lyketsos, Zenilman, Thompson, & Erbelding, 2004).

Common mental disorders are prevalent among the subset of people living with HIV (PLWH), most commonly depression, anxiety and substance abuse (Bing et al., 2001; Ciesla & Roberts, 2001; Mayston et al., 2013; Nakasujja et al., 2010; Nakimuli-Mpungu, Musis, Katabira, Nachega, & Bass, 2013). Moreover, chronic depression, stressful life events and trauma may negatively affect HIV progression (Farinpour et al., 2003; Lesserman, Jackson, et al., 1999). These risk factors may adversely affect medication adherence, which may lead to a decrease in the CD4 (Cluster of Differentiation 4) cell count and an increase in viral load, both of which are markers of disease progression (Lesserman, 2008).

Problem statement and rationale

In South Africa, CMDs are understudied among persons seeking HIV testing. When persons with mental disorders and HIV report for healthcare, it is usually unknown whether a mental disorder existed prior to the receipt of an HIV-positive test result, or whether an HIV diagnosis stimulated the onset of a CMD. It is also not known whether screening for mental disorders is effective in identifying CMD caseness among individuals seeking HIV testing. However, due to poor screening routines and limited access to resources, most CMDs go undetected and therefore untreated (Siddiqi, & Siddiqi, 2007; Lusskin, Pundiak, & Habib, 2007). It can therefore be argued that adequate detection is necessary for access to treatment (Siddiqi, & Siddiqi, 2007; Lusskin, Pundiak, & Habib, 2007). Data regarding positive and negative predictive values and optimal cut-off points on self-report measures among HIV test-seekers are limited.

A number of studies (for example, Bing et al., 2001; Freeman, Nkomo, Kafaar, & Kelly, 2008a; Israelski et al., 2007; and Olley, Seedat, & Stein, 2006) have explored the prevalence of CMDs among PLWH. However, few studies have assessed the prevalence of CMDs and CMD caseness among persons seeking HIV testing. Only four such studies have been found in both local and international literature (e.g., Rochat et al., 2006; Sahay et al., 2007; Ramirez-Avila et al.; 2012; Cholera et al., 2014).

Three of these aforementioned studies (Rochet et al., 2006; Ramirez-Avila et al., 2012; Cholera et al., 2014) probed the prevalence of depression and depressive symptoms prior to the receipt of an HIV test in South Africa, whereas one study in Pune, India, measured the symptoms of depression and anxiety prior to the receipt of an HIV test (Sahay et al., 2007). In the most recent work by Ramirez-Avila et al. (2012) and Cholera et al. (2014), the prevalence rates of depressive symptoms were investigated among HIV test-seekers in Durban and Johannesburg, South Africa, respectively. Ramirez-Avila et al. (2012) reported that the prevalence of depressive symptoms was 55% among 1 545 participants seeking HIV testing (patient and provider initiated) using the five-item Mental Health Index (MHI-5), a domain of the SF-36. Cholera et al. (2014), on the other hand, found that 32 % of the study sample (n= 397) had no depression; 18 % reported moderate depression; 5 % had severe depression; and 1 % reported very severe depression on the Patient Health Questionnaire (PHQ). These authors also found that 11.8 % of their sample could be diagnosed with a current major depressive episode according to the MINI International Neuropsychiatric Interview (MINI) (Cholera et al., 2014). The reported prevalence rates of depression are diverse due to the design of the studies, the sample size, the use of different self-report measures and diagnostic criteria. Also, the diagnosis of these psychiatric disorders and of elevated distress among HIV test-seekers can have a negative impact on quality of life, family

functioning, adherence to ART, and even case management (Kagee, & Freeman, 2008; Sterk, Theall, & Elifson, 2006; Sahay et al., 2007).

Prior diagnosis of CMDs among HIV test-seekers can contribute to enhanced case management, in which the individual is linked to support services so that psychological counselling, psychosocial support and suitable clinical care may be provided to persons in need of such services. These findings may highlight the need for providing appropriate treatment services and coping strategies. The current study seeks to address the gap in evidence on the extent of CMDs among persons seeking HIV testing and to provide data on the utility of common screening instruments to detect CMDs prior to the receipt of a HIV positive test result.

Research Questions

The study addresses the following research questions:

1   What is the prevalence of the following CMDs: major depressive disorder (MDD), generalized anxiety disorder (GAD) and alcohol use disorders among people who are seeking an HIV test?

2   What is the reported level of psychological distress among people seeking HIV testing?

3   What are the optimal cut-off scores for specific self-report measures: Beck Depression Inventory (BDI), Beck Anxiety Inventory (BAI); the Hopkins Symptom Checklist (HSCL); and Alcohol Use Disorder Identification Test (AUDIT), in predicting caseness for MDD, GAD, depression and anxiety, and alcohol use, respectively?

Research Aims and objectives

The objectives of this research project are as follows:

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1   To determine the prevalence of the following CMDs: major depressive disorder (MDD),

      generalized anxiety disorder (GAD) and alcohol use disorders among people who are seeking

      an HIV testing;

2   To determine the level of general distress among people seeking HIV testing.

3   To determine the optimal cut-off scores for the following scales with respect to the gold

      standard of the structured clinical interview for the DSM (SCID): BDI for major depression;

      the BAI for anxiety; HSCL for depression and anxiety; AUDIT for alcohol use and DUDIT

      for drug use; and

Significance of the Research

The study has the potential to represent a baseline for CMDs and distress among HIV test-

seekers, so that statements can be made about whether or not an HIV diagnosis contributes to the

development of CMDs. Individuals who might benefit from psychological treatment can also be

identified and referred for such treatment. The findings of this study could also potentially

contribute to the modification of treatment interventions and making these available to those

individuals who have met the diagnostic criteria for a psychiatric disorder.

Scope/Limitations of the Research

In view of time constraints, the diagnostic interview excludes a number of mental disorders.

The Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM-5), criteria are used in

the current study (APA, 2013). In an attempt to shorten the interview, several DSM-5 disorders

were not assessed, for example, psychotic disorders, antenatal depression, postnatal depression, and

child mental disorders. Additionally, as the study forms part of a larger research project, which

included posttraumatic stress disorder, acute stress disorder, adjustment disorder among others,

these trauma-related disorders were not included in the present study. The common DSM-5 and ICD-10 mental disorders that are explored in the current study are major depression, generalized anxiety disorder and substance use disorders (e.g. alcohol use disorders).

Chapter Conclusion

Those individuals seeking HIV testing usually go undetected and untreated for common mental disorders. This research therefore aimed to determine whether individuals seeking HIV testing might have a common mental disorder before their receipt of their HIV test result. Following this chapter is the literature review, which provides information that serves as a context within which to understand and explain the results.

Thesis Layout

Chapter 1 of the thesis includes the background of the study, the research questions, problem statement and the research aims and objectives. Chapter 2 provides both international and South African literature pertaining to CMDs. The diagnostic features of CMDs are discussed and the prevalence of CMDs in HIV-positive persons are highlighted. The theoretical framework for the study is also examined.

Chapter 3 details the research design and methodology used, including the identification of participants, the demographic profile of the sample, the research procedures and measures used, and the method of data analysis. The results of the study are presented in Chapter 4. Chapter 5 comprises a discussion of the results, including implications of the study findings and the limitations of the study. Chapter 6 presents the conclusions and recommendations for future research.

Chapter 2: Literature Review

Introduction

This chapter gives an overview of relevant literature on common mental disorders and substance use disorders. Literature searches included the following databases: Medline, Science Direct, Google scholar, EBSCO Host, Scopus, Sciverse, SUNscholar, and Psych Info. Searches focused on empirical, peer reviewed, and published studies in English between 1987 and 2016. The period was chosen to include as many studies as possible related to common mental disorders (CMD's) and substance use disorders.

Initial literature searches focused on the following broad areas:

1   Common mental disorders, including key words such as 'depression', 'anxiety' AND/OR 'prevalence', 'common mental disorders', 'screening', 'psychiatric epidemiology';

2   HIV/AIDS and HIV testing, which included keywords such as, 'diagnosis', 'HIV test seekers', 'mental disorders', 'mental health problems', and 'PLWH'. In reviewing the resulting articles and abstracts, the reference lists of these publications were examined to identify further publications relevant to the thesis subject area.

All studies reporting on epidemiological data on common mental disorders and relationships between them in adults were included for review. The literature reviewed in this chapter is organized into two parts, namely, taxonomy and nosology of CMD and CMDs in the global and South African context.

Common Mental Disorders (CMDs)

Common mental disorders are described as "depressive (depression) and anxiety disorders that are classified in ICD-10 as neurotic, stress-related and somatoform disorders and mood disorders" (Patel & Kleinman, 2003, p. 609). Common mental disorders include the following: major depression, generalized anxiety disorder, post-traumatic stress disorder, panic disorder, obsessive-compulsive disorder (OCD) and social anxiety disorder (National Institute for Health and Care Excellence (NICE), 2011).

With regard to the prevalence of common mental disorders, the rates may vary depending on whether the numbers refer to point prevalence, period prevalence or lifetime prevalence (World Health Organization [WHO], 2001). Point prevalence refers to an individual having the illness or disorder at a particular point in time (WHO, 2001). Period prevalence refers to the person having the condition at any point during a period of time. Lifetime prevalence refers to the person having the condition any time during their life (WHO, 2001). Even though point prevalence has been documented in the literature, lifetime and 12-month prevalence rates of CMDs is more appropriate for providing a clear picture of the number of people who may benefit from mental health services in a year (WHO, 2001). The prevalence of CMDs among primary healthcare attendees ranges from 10% to 40% (Goldberg & Lecrubier, 1995). Furthermore, CMDs may affect up to 15% of the general population (NICE, 2011). In South Africa, it is estimated that the lifetime prevalence of anxiety, mood or substance-related disorders are 16%, 10% and 13%, respectively (Stein et al., 2008).

The symptoms of CMDs also appear to fluctuate in severity over time, which can thwart the assessment when it comes to reaching the threshold for a diagnosis of a mental disorder. Although subthreshold psychosocial symptoms may not be suitable for formal diagnosis, it may nevertheless

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be associated with negative health outcomes, significant impairment and disability (Gask, Klinkman, Fortes, & Dowrick, 2008).

Recognition and management of common mental disorders in primary care

Previous research has found that common mental disorders (CMDs) go undetected and untreated at primary care facilities because of poor screening routines and the scarcity of resources (Siddiqi & Siddiqi, 2007; Lusskin et al., 2007). Tomson and Shiers (2003) have found that the non-treatment of common mental disorders (CMDs) can result in significant social and economic burden for families, friends and superiors. Several reasons have been suggested for the non-treatment of CMDs, which include physician-related factors, patient-related factors and challenges associated with clinics.

First, physician recognition of CMD rates is influenced by the high number of patients attending primary healthcare facilities, poor training of health professionals, as well the association between stigma and mental illness (Patel et al., 2008). Stigma refers to an attribute that characterizes people as different and that leads to a ruined and discounted person (Goffman, 1963). When stigma is applied to individuals with psychiatric disorders, it can have an effect on the individual at different levels, namely public stigma, self-stigma and label avoidance (Ben-Zeev, Young, & Corrigan, 2010). Public stigma refers to a group of people advocating stereotypes about and consequently acting against the stigmatized group of people (Ben-Zeev et al., 2010). Self-stigma, on the other hand, refers to the loss of "self-esteem and self-efficacy" when the individuals internalize public stigma (Ben-Zeev et al., 2010, p.319). Label avoidance refers to people not looking for or attending mental health services in order to escape a stigmatizing label (Ben-Zeev et al., 2010). Strümpher, Van Rooyen, Topper, Andersson and Schierenback (2014) report that professional nurses, especially those working in primary healthcare clinics, lack the necessary

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knowledge and skills related to diagnose mental illness. Furthermore, data from previous research has shown a large treatment gap between psychologically disordered individuals in need of treatment, and those individuals already receiving treatment (Lund et al., 2015). A possible reason for this large treatment gap may be the severe shortage of mental health care professionals (Strümpher et al., 2014). Given this large treatment gap ranging between 75%-90% (Williams et al., 2008; Alem et al., 2009), mental health care specialists may not be able to meet the treatment needs of psychologically disordered patients (Lund et al., 2015). Consequently, persons with mental illness are sometimes misdiagnosed and, as a result, may be given inadequate treatment.

Secondly, patient-related factors include attitudinal/evaluative barriers and structural barriers. Attitudinal/evaluative barriers refer to the patient's unwillingness to access treatment (Elhai, Voorhees, Ford, Min, & Fruech, 2009), the presence of stigma or low perceived efficacy of treatments (Mojtabai et al., 2011). Stigma and discrimination, for example, may threaten people's personal lives, reputation and status within their communities. As a result, many people with mental illnesses worldwide may be reluctant to seek help (Saxena et al., 2007; Strümpher et al., 2014). The structural barriers, on the other hand, include lack of access to treatment, inability to obtain an appointment (Motjabai, 2005; Sareen et al., 2007) and/or lack of transportation (Motjabai, 2005). For example, many patients are unable to afford transport to and from the clinics, or to purchase medication from a private healthcare facility when the public healthcare facilities' drug supplies are depleted (Strümpher et al., 2014).

Lastly, the major challenge within clinics is that of high patient loads (Avashti et al., 2008). According Strümpher et al. (2014), most clinics experience a shortage of professional nurses and other healthcare professionals, namely psychiatrists, psychologists, medical doctors and social workers. These staff shortages can lead to a heavy workload for professional nurses and long

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waiting periods for people with mental illnesses (Strümpher et al., 2014). Therefore, professional nurses become overwhelmed and insensitive when caring for individuals with mental disorders. As a result, individuals with mental disorders become despondent and leave the healthcare facility without treatment (Strümpher et al., 2014). Access to mental health services is a major challenge for many people in low and middle-income countries, which affects the detection of CMDs (Strümpher et al., 2014).

Screening for common mental disorders

Psychiatric screening questionnaires (SQs), such as self-reported measures, are useful in improving the recognition of CMDs (Berg et al., 2004). Screening is usually recommended as a way to identify individuals with "psychiatric morbidity" that would otherwise be undetected or untreated (Coyne, Palmer, Shapiro, Thompson, & DeMichele, 2004, p. 124). The effectiveness of screening measures can be assessed in terms of sensitivity (the proportion of people accurately recognized with the disorder) and specificity (the proportion of people accurately recognized without the disorder) (Halverson & Chan, 2004). Sensitivity and specificity are independent of the prevalence of the condition being screened for, in this instance CMDs (Zou, Liu, Bandos, Ohno-Machado, & Rockette, 2012). Screening is also associated with an instrument's positive-predictive and negative-predictive values (Coyne, Thompson, Palmer, & Kagee, 2000). The positive-predictive value (PPV) refers to the proportion of people who score above the optimal cut point on a screening instrument and therefore actually have the condition. The negative-predictive value (NPV), on the other hand, refers to the proportion of people who scored below the optimal cut point on a screening instrument who actually do not have the condition (Coyne et al., 2000; Zou, O'Malley, & Mauri, 2007). Notably, the PPV is dependent on the prevalence of the condition, in this case CMDs (Coyne et al.,

2000; Zou et al., 2007). Therefore, if the prevalence of CMDs were high, then the PPV would be high, while the NPV would be low.

Furthermore, according to Ali, Ryan and the De Silva (2016), screening instruments can help motivate researchers or healthcare providers to screen for CMDs early enough in their population of interest. This will more accurately inform them of the impact of untreated CMDs. The possible benefits of screening include increasing quality of life, reducing morbidity and mortality, and overall health costs (Halverson & Chan, 2004).

The major risk of screening, however, is the possibility of detecting high false positive and false negative cases (Coyne, Thompson, Palmer, Kagee, Maunsell, 2000). While the false negative cases go undetected, the false positive cases are unnecessarily referred for treatment (Kagee, 2012). The most commonly used screening instruments include the Edinburg Postnatal Depression Scale (EPDS), General Health Questionnaire (GHQ), Self-Reporting Questionnaire (SRQ), Hospital Anxiety and Depression Scale (HADS), Kessler Mental Distress Scale (K-10), Hopkins Symptom Checklist (HSCL-25), Becks Depression and Anxiety Scales (BDI and BAI), Patient Health Questionnaire (PHQ), Center for Epidemiological Studies Depression Scale (CES-D) and the Alcohol Use Disorder Identification Test (AUDIT) (Sweetland, Belkin, & Verdeli, 2014).

However, most self-reported measures assess whether or not respondents endorse emotional symptoms and therefore do not instantly measure the diagnostic criteria of a psychiatric disorder. Clinical and epidemiological studies make use of a "gold standard" in determining whether a psychiatric disorder is present or absent (Myer et al., 2008). In this context, the "gold standard" is a structured diagnostic instrument, such as the Structured Clinical Interview for the DSM (SCID) (Myer et al., 2008) that can be utilized to recognize cases of CMDs (Kagee, 2012). The limitation of the SCID is that it is resource- and time-intensive. The "gold standard" also includes the

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unstructured clinical interviews, MINI International Neuropsychiatric Interview (MINI), Composite International Diagnostic Interview (CIDI), Clinical Interview Schedule (CIS), Present State Examination (PSE), and the Comprehensive Psychopathological Rating Scale (CPRS) (Sweetland et al., 2014). Previous research has found that the prevalence estimation of self-reported measures is higher than that of diagnostic interviews (Coyne et al., 2000; Lustman et al., 2000). In a systematic review, for example, Anderson, Freedland, Clouse, and Lustman (2001) found that when using diagnostic interview methods, 11.4% of diabetic patients were diagnosed with a depressive disorder, while self-report measures yielded elevated depressive symptoms of 31.0%.

Comparison of Self-Report Measures with Structured Diagnostic Tests

Major depressive disorder. The predictive values of the Beck Depression Inventory (BDI) for the detection of depression in the general population in the UK were assessed using the Schedules for Clinical Assessment in Neuropsychiatry (SCAN) (Lasa, Ayuso-Mateos, Vazquez-Barquero, Diez-Manrique, & Dowrick, 2000). Lasa et al. (2000) reported that the AUC of 0.99 in their study showed that the BDI is a screening tool with good accuracy for identifying depression. Diagnostic accuracy describes the level of agreement between the findings from the diagnostic interview and the self-report measure (Bossuyt et al., 2003; van Stralen et al., 2009). Furthermore, it was found that the optimal cut-off point of 12/13 yielded sensitivity of 100% and specificity of 99% (Lasa et al., 2000). Therefore, these authors conclude that the BDI is a useful instrument for identifying depression in community settings (Lasa et al., 2000). In contrast, Nuevo, Lehtinen, Reyna-Liberato, and Ayuso-Mateos (2009) found that with a higher cut-off score of 17/18, the sensitivity (70.1%) and specificity (73.7%) values of the BDI-I against the SCAN as gold standard was lower than that of Lasa et al. (2000). However, the AUC value 0.81 was indicative that the BDI was a moderately useful scale in identifying depression in the Finnish community (Nuevo et al.,

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2009). In Germany, Forkmann et al. (2009) investigated the performance of the BDI in detecting depression among cardiac inpatients.

According to Hedayati, Bosworth, Kuchibhatla, Kimmel, and Szczech (2006), the Center for Epidemiological Study of Depression (CESD) cut-off point with the best diagnostic accuracy of 80% was determined to be 18. Using the SCID as gold standard, this cut-off score of 18 yielded a sensitivity of 69%, specificity of 83%, PPV of 60%, and NPV of 88%. On the other hand, the BDI cut-off point of 14 yielded a sensitivity of 62%, specificity of 81%, PPV of 53%, NPV of 85% (Hedayati et al., 2006). When compared with the CESD and the SCID, the agreement between this BDI cut-off against the SCID as gold standard was modest (Hedayati et al., 2006).

It has also been shown that among Australian 891 men and 1086 women, the sensitivity of the self-report medical condition questionnaire compared to the SCID-I/NP was 61.0%, specificity was 89.5%, PPV was 61.9%, NPV was 89.2% and the overall level of agreement (kappa) was 0.5 (Stuart et al., 2014). Therefore, the overall level of agreement between self-report depression and clinically determined depression using the SCID-I/NP was moderate to good (Stuart et al., 2014).

Furthermore, within a nationally representative study in Australia (ages 32-37, and 52-58), the performance of the Patient Health Questionnaire (PHQ-9) was assessed against the WMH CIDI as gold standard. In the PATH study, the findings showed that the PHQ-9 cut-off point of 8 yielded sensitivity and specificity values of 0.79 and 0.86, respectively (Kiely & Butterworth). These authors reported that this cut-off point of 8 was lower than that found in medical studies (Kiely & Butterworth, 2015). For example, similar results of sensitivity and specificity were found using the PHQ cut point of 11, which is usually identified to be the optimal cut-off point in medical settings (Löwe et al., 2004). Considering that the PHQ-9 was designed to be used in medical populations,

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the diagnostic accuracy of the PHQ-9 in the PATH study appears to be somewhat poorer (Kiely & Butterworth, 2015).

The validity of the K-10 has been assessed among 429 HIV-positive individuals near Cape Town, South Africa, against the MINI as gold standard (Spies et al., 2009a). These authors showed that the K-10 was a useful screening measure for current major depression with an AUC value of 0.77, with a slightly declined AUC of 0.75 for past major depressive disorders (Spies et al., 2009). Moreover, the scale was able to correctly differentiate between true cases and non-cases of current major depression (sensitivity of 0.67; specificity of 0.77) and past major depression (sensitivity of 0.72; specificity of 0.75). For this reason, these authors established that the K-10 was an effective measure in determining both current and past major depressive episodes (Spies et al., 2009a). Among 129 pregnant women in the Western Cape, South Africa, the performance of the K-10 in detecting major depression was assessed against the SCID as gold standard (Spies et al., 2009b). The performance of the K-10 was found to be acceptable with an area under the curve of 0.66. The best cut-off point in identifying major depression (21.5), yielded optimal sensitivity (0.75) and specificity (0.54) values. Therefore, the K-10 was a useful screening tool in discriminating between major depression caseness and non-caseness in pregnant women (Spies et al., 2009). Spies et al. (2009b) argue that the small sample size of pregnant women restricted the K-10 in displaying higher sensitivity and specificity values.

Persistent depressive disorder. The performance of the depression subscale of the Hospital Anxiety and Depression scale (HADS-D) in recognizing dysthymia was assessed using the MINI as gold standard (Bunevicius, Peceliuniene, Mickuviene, Valius & Bunevicius, 2007). These authors showed that among 503 primary care patients in Lithuania, the HADS-D is not an optimal screening

instrument for dysthymia. The AUC value of 0.60 indicated poor accuracy of the HADS-D for dysthymia.

Generalized anxiety disorder. The performance of the K-10 in discriminating between generalized anxiety disorder caseness and non-caseness was also assessed within a sample of 429 HIV-positive persons in Cape Town, South Africa (Spies et al., 2009a). Consistent with other K-10 validation studies (e.g. Baillie, 2005; Cairney et al., 2007; Furukawa, Kessler, Slade & Andrews, 2003; Kessler et al., 2002), the K-10 against the MINI as gold standard was a useful proxy measure for generalized anxiety disorder with an AUC of 0.78 (Spies et al., 2009a). These authors found that a cut-off score of 30 yielded the best sensitivity (0.72) and specificity (0.80) values.

Alcohol use disorder. Using the AUDIT against the MINI as gold standard, the area under the curve of the AUDIT was 0.96, which suggests that the AUDIT was a useful screening tool in identifying alcohol abuse or dependence (Myer et al., 2008). Myer et al. (2008) also reported that with a sensitivity of 100%, all the individuals (n = 465) have met the diagnostic criteria for alcohol abuse or dependence. The AUDIT, however, only identified 79% of those individuals who did not meet the diagnostic criteria of alcohol abuse or dependence, in other words, true non-cases (Myer et al., 2008).

Taxonomy and Nosology of Common Mental Disorders

In this part of the chapter, the classification of the common mental disorders, namely major depressive disorder, persistent depressive disorder, generalized anxiety disorder, and alcohol use disorder, are outlined. An examination of the paradigm of nosology will also be presented.

Major depressive disorder (MDD): Single and recurrent episodes. Major depressive disorder, which is also known as clinical depression, major depression, unipolar depression and

unipolar disorder, is considered a common mental disorder with episodes of low mood, and a loss of

interest or pleasure in typically pleasurable activities. The lifetime prevalence of major depressive

disorder (MDD) ranges from 10% to 18.5% within American samples (Kessler, & Walters, 1998;

Lewinsohn, & Essau 2002; Lewinsohn, Hops, Roberts, & Seeley, 1993; Rohde, Beevers, Stice, &

O'Neil, 2009) and the age of onset is in adolescence or early childhood for MDD (Zisook, Lesser,

Stewart, et al., 2007). Specifically, as indicated by longitudinal studies, the age of onset for MDD is

almost 15 years, with episodes lasting six months (Lewinsohn, Clarke, Seeley, & Rhode, 1994).

The criteria used for the diagnosis of current major depressive episode are the same as the

diagnostic criteria for a recurrent major depressive episode. The diagnostic criteria for a major

depressive disorder are outlined in the DSM-5 (American Psychiatric Association (APA), 2013).

Persistent depressive disorder (PDD) (Dysthymia). Persistent depressive disorder, also

known as dysthymia, is associated with depressed mood and loss of sexual interest nearly every

day, for at least two years (APA, 2013). During these two years, the intervals with no depression

last no longer than two months (APA, 2013). Additionally, the persistently depressed mood is

accompanied by two (or more) of the following: appetite disturbance, sleep disturbance, low

energy, poor self-esteem, insufficient concentration or experiencing a challenge in making

decisions, and feelings of hopelessness (APA, 2013). Episodes of MDD may come before PDD and

occur during PDD; in which case, both are diagnosed (APA, 2013). Patients should report

significant impairment in their lives to be diagnosed, and this impairment must not be due to

cyclothymic disorder, bipolar disorder, a psychotic disorder, substance use disorder or any other

medical condition. Those individuals who experience major depressive disorder symptoms for two

years may be diagnosed with "double depression", therefore, they have met the diagnostic criteria

for both persistent depressive disorder and major depressive disorder. Additionally, the age of onset

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for PDD is in childhood, adolescence, or early adult life. The median age of onset is 31.1 (Kessler, Chiu, Demler, Walters, 2005). The diagnostic criteria for PDD are outlined in the DSM-5 (APA, 2013).

Generalized anxiety disorder (GAD). Previous research has shown that GAD is common in primary care facilities (Maier et al., 2000; Roy-Byrne, Katon, Broadhead, et al., 1994; Üstün, & Sartorius, 1995). According to the DSM-5, GAD is defined as severe anxiety and worry about events nearly every day for at least six months (APA, 2013) and the individual finds it difficult to control the worry. Generalized anxiety disorder is characterized by the following somatic symptoms: muscle tension, irritability, difficulty falling asleep or staying asleep and restlessness (APA, 2013). Psychical symptoms are also associated with GAD, including feelings of nervousness, fear, tremors, sweating, tension and light-headedness (Casey & Byng, 2011).

With regard to age of onset, Kessler et al. (2007) found that the distribution of ages of onset of GAD, with ages ranging between 24 and 50 years, was much later compared to MDD. In addition, the diagnostic criteria of GAD are delineated in DSM-5 (APA, 2013).

Substance use disorder. The DSM-5 (APA, 2013) category for substance use disorders lists combined substance abuse and substance dependence as one disorder. Substances can be classified as separate disorders, for example, alcohol use disorders, cannabis use disorders and stimulant use disorders. The abovementioned substances share similar overarching criteria (APA, 2013). A substance use disorder is diagnosed when an individual has two or three symptoms from a list of 11 for a 12-month period. Examples of such symptoms include the following:

1   recurrent substance use in situations that cause physical danger to the user;

2   social impairment in school or work situations, or after these, resulting in social, interpersonal or legal problems; and

3   craving for the substance, which manifests itself in a persistent desire for the substance (APA, 2013).

The age of onset for substance use has been shown to be between 14 and 15 years (Richter et al., 2006).

In South Africa, the lifetime prevalence of substance use disorders is high, with 13.3% of the population meeting the diagnostic criteria for a substance use disorder (Herman et al., 2009). In addition, the most frequently used substance in South Africa, excluding the Western Cape and the Northern region (Mpumalanga and Limpopo), is alcohol. The percentage of patients in treatment for alcohol abuse in the Western Cape is 20%, compared to 51% of patients in the Central Region, which includes Gauteng, Free State, Northern Cape, and North-West (Dada et al., 2013). Also, the criteria used for the diagnosis of alcohol used disorder are delineated in the DSM-5 (APA, 2013).

Psychological distress. Psychological distress is associated with depression and anxiety and further refers to the emotional state of an individual (Mirowsky & Ross, 2002). Psychological distress can be viewed as an emotional state that can negatively influence an individual's social functioning and daily life (Wheaton, 2007). The symptoms commonly associated with psychological distress include difficulty sleeping, feeling sad or down, lack of excitement, hopelessness about the future and feeling emotional (e.g., crying easily) (Burnette, & Mui, 1997; Decker, 1997; Lincoln, Taylor, Watkins, & Chatters, 2011; Kleinman, 1991; Kirmayer, 1989; Drapeau et al., 2012).

Therefore, psychological distress is most commonly described as a non-pathological mental health condition (Drapeau et al., 2012; Dohrenwend, & Dohrenwend, 1982). Subsequently, ordinary non-mentally ill persons also experience distress. Distress is defined by elevated scores on a self-report measure of mental health symptoms, whereas a CMD is an actual psychiatric diagnosis, in other words an illness.

Classification of Mental Disorders

The present study rests on the assumption of a nosological understanding of psychiatric disorders, that is, that psychiatric conditions are circumscribed and are identifiable as separate from one another. Yet, "although DSM-5 remains a categorical classification of separate disorders, we recognize that mental disorders do not always fit completely within the boundaries of a single disorder" (APA, 2013, p. xIi)

Psychiatric nosology refers to the classification of mental illnesses and behavioural disorders (APA, 2013). In addition, nosology serves several purposes, for example, it is essential for the "communication" between clinicians and researchers about what indicates a specific "disease and what does not" (Avashti, Sarkar, & Grover, 2014; p. 301). Nosology "is also useful in understanding the prevalence of the problems and disorders, so that suitable healthcare planning can be done" (Avashti et al., 2014, p. 301).

The DSM-5 classification of major depression, persistent depressive, generalized anxiety and alcohol use disorders is used in the present study. This classification incorporates both a categorical and a dimensional approach to nosology, namely a hybrid approach. The categorical approach draws clear boundaries between disorders and normality and does not account for clinical experience or scientific observations (APA, 2013).

The dimensional approach, on the other hand, postulates that the "symptoms of disorder exist on a dimension which is a continuum from normal to severely ill" (Avashti et al., 2014, p. 303). The dimensional approach transcends the boundaries set by a categorical approach and accommodates the notion that the symptoms present in a single disorder may occur in many other disorders (APA, 2013). An advantage of this approach is an increase in the validity of a diagnosis.

However, dimensional approaches are converted back to categorical approaches by means of cut-points to determine common mental disorder caseness or non-caseness (Nesse & Stein, 2012). Patients with scores above a certain cut-off point on a self-report measure may be viewed as having a specific disorder, while those with scores below this cut-off point may be viewed as not having this condition (Stein, 2012). Therefore, for the purposes of the current study, both dimensional and categorical approaches (hybrid approach) are incorporated, as the DSM-5 reflects both.

Criticism on the Paradigm of Nosology.

The categorical approach of nosology is confronted with several problems. For example, one of the issues is the threshold of a diagnosis. It is not always clear at which threshold the person should be diagnosed with the disorder (Avashti et al., 2014). Furthermore, those symptoms that fall below the threshold, namely syndromal symptoms, are not diagnosed with the categorical approach of nosology. These sub-syndromal symptoms are coupled with dysfunction and disability and treatment may improve health outcomes (Avashti et al., 2014).

The dimensional approach is also confronted with some challenges. For example, it is unknown whether a large number of separate dimensions are warranted for each disorder, or if all mental health disorders can be explained by means of fewer dimensions (Avashti et al., 2014).

The hybrid approach, which combines both the categorical and dimensional approach, also faces some challenges as it can be seen as a collaborated approach that does not have distinct biological understanding (Avashti et al., 2014). The use of cut-off points to identify an illness or disorder relies on the decision of a healthcare professional and therefore does not determine the true presence and absence of illness or disorder (Avashti et al., 2014).

Although the hybrid approach is not without challenges, it is still the most useful approach for clinicians in diagnosing an individual with an illness or disorder (categorical approach). Furthermore, researchers who are more interested in the dimensional aspect of nosology can evaluate an individual's reaction to a specific treatment and determine aetiology (Avashti et al., 2014).

Summary of common mental disorders, recognition, screening and taxonomy.

The research on common mental disorder uses a wide range of terminology. Literature makes use of the following terms regularly: common mental disorders (CMDs), lifetime prevalence, 12-month prevalence, screening instruments, sensitivity, specificity, positive predictive value, negative predictive value, optimal cut-off points, caseness, etc.

With regard to screening, literature has shown that sensitivity, specificity, PPV, NPV as well as optimal cut-off scores can be used to determine the effectiveness of the screening instruments in predicting CMD caseness or non-caseness.

The hybrid approach (e.g., combination of categorical and dimensional approaches) of psychological nosology has been adopted for the purposes of the current study. More recent evidence suggests that this approach contributes to clinicians being able to determine whether an

individual has an illness or not (categorical) and that the symptoms of one illness/disorder can overlap with another illness/disorder.

Common Mental Disorders in the Global and Sub-Saharan Context

This part of the review presents literature on the prevalence and risks of CMDs in the global and sub-Saharan context.

Prevalence of common mental disorders (CMDs). In the global context, the lifetime prevalence rate of CMDs was reported to range between 12.0% and 47.4% across 17 countries (Kessler et al., 2007). There was a prevalence of 37% for common mental disorders among participants in the United Kingdom (Maginn et al., 2004). Similarly, in a Qatari population attending a primary healthcare setting, the overall prevalence of mental disorders was 36.6% (Ghuloum, Bener, & Abou-Saleh, 2011). Common mental disorders are also related to considerable disability and consequently present a major public health problem (Ormel et al., 1994; Srinivasan, Isaacs, Villanueva, Luca & Raghunath, 2010). In addition, in developing countries, high rates of CMDs have also been found in several studies (Bradshaw et al., 2003; Desajarlais, Eisenberg, Good, & Kleinman, 1995; Herman et al., 2009; Lopez et al., 2006).

However, a paucity of studies has measured the prevalence of CMDs in sub-Saharan countries, even though these countries contribute to a high burden of disease across the globe. A previous review of the literature has shown that in Africa the prevalence of CMDs ranges between 8% and 43% depending on the measuring instrument used and population of interest (Jablensky et al., 2001). In Tanzania among 178 primary clinic attendees, the prevalence of CMDs was estimated at 24% (Ngoma, Prince, & Mann, 2003). Also, two studies in Zimbabwe found the prevalence of CMDs at 25% and 26% respectively in primary care settings (Patel, 1998; Reeler, Williams, &

Todd, 1993a). On the other hand, a lower prevalence rate of 3.1% for CMDs was found within an urban setting in Tanzania using the Clinical Interview Schedule-Revised (CIS-R) (Jenkins et al., 2010).

Few studies have assessed the prevalence, incidence and duration of CMDs in general and specifically among those living with HIV in South Africa. The first population-based study of psychiatric morbidity was conducted among 4351 adults, the South African Stress and Health Study (SASH) (Herman et al., 2009; Seedat et al., 2009; Seedat et al., 2008). The SASH study has shown that approximately 30.3% of the sample has been diagnosed with a psychiatric disorder in their lifetime that has gone untreated (Herman et al., 2009; Seedat et al., 2009; Seedat et al., 2008). The SASH further showed that 16.5% of the sample has experienced a CMD over a twelve-month period, but only 25% of the adults were treated for this condition (Seedat et al., 2008). In the SASH study, the most common DSM-IV mental disorders among 4351 adults in the general population over a twelve-month period, were major depressive disorder (4.9%), agoraphobia without panic (4.8%) and alcohol abuse (4.5%) (Herman et al., 2009). These authors also found that women tend to report mood and anxiety disorders more often, while men report substance use disorders more frequently (Herman et al., 2009). In addition, the prevalence of CMDs among people living with HIV is high (Breuer, Myer, Struthers & Joska., 2011; Nakimuli-Mpungu et al., 2012; Breuer et al., 2014). For example, 43.7% of people living with HIV attending public health facilities had a psychiatric disorder as assessed by the CIDI (Freeman et al., 2008).

Regarding mental health and HIV, there is an assumption that an HIV-positive diagnosis may be a risk factor for an individual to become depressed, traumatized or have any of the CMDs (Brandt, 2009; Freeman, 2004; Olley et al., 2003). Yet, mental health disorders, such as depression,

may precede an HIV-positive test result (Smart, 2009). It is also assumed that among people living with HIV (PLWH), the prevalence rates of CMDs are higher than in the general population.

Furthermore, the representation of CMDs differs according to different study settings, screening tools, recruitment procedures, and illness perceptions. For example, in Spain among 5473 participants attending a general medical practice, 22.5% and 14.8% of the sample met the diagnostic criteria for depression and generalized anxiety disorder, respectively (Fernández et al., 2006). Several studies have acknowledged CMDs in primary care settings in India (Murthy, Kuruvilla, Verghese & Pulimood, 1976; Harding et al., 1980; Shamsunder, Krishnamurthy, Prakash, Prabhakar & Krishna, 1986; Seshadri, Kumar, Moily & Gangadhar, 1988; Patel et al., 1998; Pothen, Kuruvilla, Philip, Joseph, & Jacob, 2003). The findings from these studies indicate that the prevalence of CMDs ranges from 17% to 46% among patients attending primary care facilities. For example, in the study by Pothen et al. (2003), the results indicated that among primary care patients, 33.9% were diagnosed with CMDs using a standardized semi-structured interview, the Revised Clinical Interview Schedule (CIS-R). The authors further found that depression was the most common diagnosis with a high prevalence rate of 83.8% (Pothen et al., 2003). Subsequently, in an Israeli study, the CIDI_SF (short form) was administered to evaluate the prevalence of psychiatric disorders among primary care patients (n = 976) (Cwikel, Zilber, Feinson, & Lerner, 2008). These authors found that depression was most prevalent at 20.6%, followed by generalized anxiety disorder at 11.2%, and with panic disorder the lowest at 7.2% (Cwikel et al., 2008).

In the next section, the prevalence of major depression, persistent depressive, generalized anxiety, and alcohol use disorder are organized as follows: First in the general population, and then among people living with HIV. The World Bank Development Index was utilized to differentiate high from low-middle income countries (World Bank, 2016). The studies further deal with a wide

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range of epidemiological measurements (e.g. structured and self-report instruments) and include population, primary care facilities, medical, and people living with HIV (PLWH) samples.

Prevalence of major depressive disorders (MDD).

Prevalence of MDD in the general population. In high-income countries, numerous studies have reported the prevalence of major depression within the general population (e.g., Kessler et al., 2005; Bing et al., 2001; Caron et al., 2012; Morrison et al., 2002; Kessler & Bromet, 2013). Kessler et al. (2005), for example, found a 12-month prevalence rate of 6.7%% for MDD among an American sample of 9 282 respondents in the general population using the World Mental Health Survey Initiative version of the World Mental Health Organization Composite International Diagnostic Interview (WHO-CIDI). The first Epidemiological Catchment Area Study on mental health has been conducted in Canada recently. The prevalence of MDD as assessed by the Community Health survey questionnaire (CCHS) 1.2 version of the Composite International Diagnostic Interview (CIDI) was 9% (Caron et al., 2012).

In Australia, data collected as part of the Geelong Osteoporosis Study (GOS), made use of the structured clinical interview for the DSM-IV Non-patient edition (SCID-I/NP) to assess major depression. In this population-based study, among a total of 1086 women and 891 men, 26.2% of the women and 16.4% of the men met SCID-I/NP criteria for lifetime depression; the most common being major depressive disorder (87%, n = 375) (Stuart et al., 2014).

The WHO World Mental Health survey initiative also estimated the prevalence of MDD in low- and middle-income countries (Kessler, & Ustun, 2004; Kessler, & Ustun, 2008). For example, in Brazil, using the CIDI, 18.4% of the individuals in the community met the diagnostic criteria for MDD, while 10.4% of the sample was diagnosed with MDD the 12-months preceding the

questionnaire (Kessler; & Üstün, 2004, Kessler; & Üstün, 2008). A lower lifetime and 12-month prevalence rate of 13.3% and 6.2% respectively was found within in the general population in Columbia (Kessler; & Üstün, 2004, Kessler; & Üstün, 2008). In China, however, using the CIDI, the prevalence of MDD was much lower than that in Brazil and Columbia (Shen et al., 2006). Shen et al. (2006) found that 2.0% of the sample in the community-based study was diagnosed with MDD. The authors conjectured that the low prevalence rate in China might have been because of methodological problems, which include the under-reporting of symptoms due to stigma (Shen et al., 2006).

In Nigeria, measurement was done as part of the Nigerian Survey of Mental Health and Well-being (NSMHW), a population-based survey using the WMH-CIDI (Gureje, Lasebikan, Kola, & Makanjuola, 2006). Gureje et al. (2006) indicate that 3.3% of their sample (n = 4 984) had lifetime major depressive disorder, whereas the 12-month prevalence was estimated at 1.0%. These authors argue that a possible reason for the low prevalence rates might be the variance in the age of onset of the population (Gureje et al., 2006). For example, the age of onset of 45 years for any mood disorder (Gureje et al., 2006) was higher than the commonly recommended age of onset in adolescence or childhood (Zisook et al., 2007). In Uganda, however, using the criteria of the Diagnostic and Statistical Manual IV (DSM-IV), the prevalence of MDD was 21% in the general population (n = 587) (Bolton, Wilk, & Ndogoni, 2004). Bolton et al. (2004) speculate that this high prevalence rate in their sample may be due to poverty rather than HIV. In rural Rwanda, 15.5% of the sample (n = 368) in the general population met the DSM-IV diagnostic criteria for major depression (Bolton, Neugebauer, & Ndogoni, 2002), while a slightly higher rate of 17.9% for depressive symptoms was found using the depression subscale of the HSCL-25 (DHSCL).

As previously mentioned, the SASH study, the first population-based study in South Africa, reported the lifetime and 12-month prevalence of psychiatric disorder in South Africa (Herman et al., 2009) and it forms part of the World Health Organization World Mental Health (WMH) Survey Initiative (Kessler, Haro, Heeringa, Pennell, & Ustün, 2006; Demyttenaere et al., 2004). In the SASH study, making use of the CIDI, the lifetime prevalence of major depression was 9.8%, while the 12-month prevalence was 4.9% (Herman et al., 2009; Tomlinson, Grimsund, Stein, Williams, & Myer, 2009). These authors compared the SASH study with the World Mental Health Survey (WMH) and found that the 12-month prevalence of mood disorders were higher than in other countries in the WMH survey. However, the prevalence rates of mood disorders in some countries such as Belgium, Lebanon, France, Ukraine, Israel, New Zealand, and the USA were higher than in South Africa (Herman et al., 2009). In the Eastern Cape in South Africa, a cross-sectional population-based study was conducted among 977 individuals aged between 18 and 40 (Andersson et al., 2013). In this study, it was found that 31.4% of the sample met the criteria for a lifetime depression using the MINI. Several explanations have been provided for the high prevalence rate of depression. For instance, according to Andersson et al. (2013), the majority of their sample comes from poor regions in the Eastern Cape, South Africa, where people are subjected to high levels of poverty and economic distress.

Compared to the above-mentioned community-based studies, the prevalence of MDD in South Africa was higher than the sample of Yoruba-speaking Nigerians and higher than most of the countries depicted in the WHO WMH project, but lower than the rates in Uganda, and Rwanda (Bolton et al., 2004; Bolton et al., 2002, Gureje et al., 2006; Herman et al., 2009; Tomlinson et al., 2009).

Prevalence of MDD among PLWH. The World Health Organization (2008) sees an association between mental health and HIV/AIDS. For example, a higher 12-month prevalence rate of MDD was found among 2 864 HIV-infected individuals in the USA than in the general population (Bing et al., 2001). Bing et al. (2001) reported a prevalence rate of 36.0% in their sample, while in the general population a lower prevalence rate of 7.6% was found (Bing et al., 2001). An even high rate of 45.5% for depression was detected among HIV-infected outpatients in the USA (Cohen et al., 2002). Furthermore, Berger-Greenstein et al. (2007) report a high prevalence rate of 72.9% for MDD, which was higher than that reported by Bing et al. (2001) and Cohen et al. (2002). These authors surmise that this high prevalence rate was likely due to risk factors such as traumatic events and intravenous drug use and a poor socio-economic status (Berger-Greenstein et al., 2007).

In a systematic review by Collins, Corcoran, & Perry (2006), the prevalence of mental health disorders among PLWHA in low- and middle-income countries (LMIC) were found to range from 0% to 63.3% (Collins et al., 2006). Collins et al. (2006) concluded that among PLWHA a high prevalence of depression was found than in the general population. For example, in Nepal, using the CIDI, 14% of the sample (n = 125) met the diagnostic criteria for MDD (Kohrt, Luitel, Acharya, & Jordans, 2016).

In Africa, however, the point prevalence of MDD was shown to be between 3% and 54% (Petrushkin, Boardman, Ovuga, 2005; Myer et al., 2008; Olley et al., 2006; Kaharuza et al., 2006; Adewaya et al., 2007; Nakasujja et al., 2010). Using the MINI, the prevalence of major depression was 27.8% among 360 HIV-positive individuals in Nigeria, while it was 12.8% for HIV-negative individuals (Onyebueke, & Okwaraji, 2015). These authors concluded that this high prevalence of depression among HIV-positive individuals may not only be attributable to their HIV/AIDS status,

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but may also be a consequence of the anti-retroviral medication and the burden of illness related to HIV/AIDS, which can affect their mood (Onyebueke, & Okwaraji, 2015). A similar MINI-defined prevalence rate of 11.3% for MDD was found among 649 TB-and HIV-infected Zambians (Van den Heuvel et al., 2013). However, an even higher MINI-defined prevalence rate of 52.2% for MDD was found among PLWHA in Nigeria (Sulyman, Abiodun, & Yussuf, 2012).

In Zimbabwe, it was found that 33% of postnatal women met the criteria for major depression and more HIV-positive women than HIV-negative women had mean depressive scores (Chibanda et al., 2010). Conversely, among 618 HIV-infected persons in Uganda, the prevalence of MDD was 8.1% as assessed by the MINI (Kinyanda, Hoskins, Nakku, Nawaz, & Patel, 2011).

In South Africa, using the MINI, the prevalence of MDD was 34.9% among HIV-infected individuals (Olley et al., 2003). The authors found that 6 months later, 26% of their sample met the diagnostic criteria for depression (Olley et al., 2006). Conversely, using the same diagnostic interview, the MINI, the prevalence of depression was 14% in 465 HIV-positive patients receiving treatment in South Africa (Myer et al., 2008). Freeman, Nkomo, Kafaar and Kelly (2007), however, using the Composite International Diagnostic Interview (CIDI), found that 11.1% of an HIV-positive sample of 900 in South Africa was depressed.

The prevalence of major depression in the above-mentioned studies differs substantially. A possible reason for the wide variability in the rates of major depression may be due to the different measuring instruments, the demographic factors, such as gender, age and socio-economic status and study settings (Kagee, & Martin, 2010; Ramirez-Alvira et al., 2012).

Prevalence of persistent depressive disorder (PDD).

Prevalence of PDD in the general population. According to the DSM-5, the 12-month prevalence of persistent depressive disorder (PDD; also, known as dysthymia) in the general population was 0.5% in the USA (APA, 2013). A slightly higher prevalence of 2.5% for dysthymia has been reported among 9282 persons within the general population in the USA using the CIDI (Kessler et al., 2005). Among Finns, the Composite International Interview (CIDI) was used to diagnose dysthymia, which derived a slightly higher 12-month prevalence of 4.5% (Markkula et al., 2015). An even higher rate of dysthymia was estimated among the Seguimiento Universidad de Navarra (SUN) project in Spain (Sanchez-Villegas et al., 2008). Using the SCID-I, a prevalence rate of 14% was reported for dysthymia (Sanchez-Villegas et al., 2008).

In Australia, a population-based study, namely the Personality and Total Health (PATH) study, the prevalence of dysthymia was assessed (Kiely & Butterworth, 2015) using the WHO-CIDI (Kessler et al., 2013; Kessler, & Ustun, 2004). Kiely and Butterworth (2015) found that 2.7% of the sample met the diagnostic criteria for dysthymia in the past 12-months (95%CI = 2.0, 3.4). Correspondingly, in another community-based study in Australia, namely the 2007 National Survey Mental Health and Wellbeing (NSMHWB), the WHO-CIDI (version 3.0) was utilized to evaluate the prevalence of psychiatric disorders (Australian Bureau of Statistics, 2009). The NSMHWB found a 12-month prevalence rate of 2.1% (95%CI = 1.3, 2.9) for dysthymia (Australian Bureau of Statistics, 2009).

The prevalence of dysthymia (persistent depressive disorder) was also assessed in low- and middle-income countries. In São Paulo, Brazil, using the SCID I/P (patient's edition), the prevalence of dysthymia was estimated among psychiatric outpatients (Avrichir & Elkis, 2002). Among this sample of psychiatric outpatients, 27.1% of the sample met the diagnostic criteria for

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dysthymia. An even lower rate of 0.1% for dysthymia was found in China using the CIDI (Shen et al., 2006). Shen et al. (2006) speculate that this low prevalence rate may be due to the non-disclosure of mental health issues as a result of stigma (Shen et al., 2006).

In the Nigerian Survey of Mental Health and Well-being (NSMHW) a low lifetime prevalence rate of 0.2% for dysthymia was found within the community, whereas the 12-month prevalence was found to be 0.1% (Gureje et al., 2006). Likewise, the population-based SASH study, a national representative survey of 4351 adults interviewed with the WHO-CIDI yielded a low prevalence of dysthymia (PDD) of 0.1% (Williams et al., 2008).

Prevalence of PDD among PLWH. Notably, dysthymia is also common among HIV-infected individuals diagnosed with major depression (Gaynes et al., 2015). Gaynes et al. (2015) reported that among American HIV-positive individuals diagnosed with MDD (18%), 49% of the sample had co-morbid dysthymia as measured by the MINI (n = 304). This co-morbidity of MDD and dysthymia was associated with significant HIV-infection severity and poorer quality of life (Gaynes et al., 2015). The definition of quality of life in mental health research is not always clear and consistent (Mogotsi, Kaminer, & Stein, 2000). Nonetheless, quality of life comprises a person's subjective experience (Mogotsi, Kaminer, & Stein, 2000). Furthermore, quality of life recognizes that factors such as life satisfaction, well-being, and perceptions of living conditions play a role in the assessment and treatment of psychiatric disorders (Mogotsi, Kaminer, & Stein, 2000).

Berger-Greenstein et al. (2007) assessed the prevalence of dysthymia among an American sample of 85 HIV-infected individuals. The prevalence of dysthymia was only assessed when the sample did not meet the diagnostic criteria for MDD (Berger-Greenstein et al., 2007). Considering this, the prevalence rate for dysthymia was 4.7% compared to the total sample, while 17.4% of the sample had dysthymia in the absence of MDD (Berger-Greenstein et al., 2007). Another study in

the USA assessed the prevalence of dysthymia among HIV-positive individuals using the short form of the CIDI (CIDI-SF) (Turner & Fleishman, 2006). These authors found that the prevalence of dysthymia was higher among women (31%) than among men (17%) (Turner & Fleishman, 2006).

In Nigeria, the MINI was utilized among people with HIV/AIDS to assess the prevalence of dysthymia (Sulyman et al., 2012). The prevalence of dysthymia was found to be 26.1% among 300 PLWHA (Sulyman et al., 2012). A lower rate of dysthymia was estimated among 87 HIV-positive individuals in Nigeria (Adewuya et al., 2007). Adewuya et al. (2007) report that 9.1% of the sample met the diagnostic criteria for dysthymia as assessed with the MINI.

In South Africa, the prevalence of PDD was also estimated among people living with HIV (PLWH). Using the MINI, the prevalence of PDD in HIV-infected individuals was 21.5% (Olley et al., 2003). A similar rate of 22.9% for MINI-defined dysthymia was found among 105 HIV-positive women in South Africa, while a much lower rate of 2.0% for dysthymia was found at follow-up (Olley, 2006). A plausible reason for this decline may be that those women who were more resilient and less distressed may have returned for follow-up (Olley, 2006). The prevalence of PDD among people seeking HIV testing is not known.

Prevalence of generalized anxiety disorder (GAD)

Prevalence of GAD in the general population. Generalized anxiety disorder (GAD) is associated with increased health services utilization (Wittchen et al., 2002. The lifetime prevalence of GAD was 5.1% in the USA in the general population (Wittchen, Zhao, Kessler, & Eaton, 1994; Kessler et al., 2008). Similarly, the prevalence of GAD was 5.7% as estimated by the WMH-CIDI among 9282 American respondents (Kessler et al., 2005). In Europe, the 12-month prevalence of

GAD ranges between 1.7% and 3.4% (Wittchen et al., 2011), and the lifetime prevalence ranges between 4.3% and 5.9% (Wittchen, & Jacobi, 2005). In a national representative sample of primary care practices in Germany using the Generalized Anxiety Screening Questionnaire (GAS-Q), a modified version of the Anxiety Screening Questionnaire (ASQ), the prevalence of GAD was 5.4% (Wittchen et al., 2002).

Furthermore, in the Australian PATH study, the prevalence of GAD was compared with the national survey prevalence estimates (i.e. 2007 National Survey Mental Health and Wellbeing (NSMHWB); Kiely & Butterworth, 2015). The PATH study found the 12-month prevalence rate of GAD as 4.3% (95%CI = 3.3, 5.1), and the equivalent prevalence estimate in the NSMHWB was 4.6% (95% CI = 2.85, 6.35) (Kiely, & Butterworth, 2015).

However, higher prevalence estimates were found in a large primary care study, the Dialogue project (Roberge et al., 2015). In Canada, the Dialogue project recruited 373 adults meeting the diagnostic criteria for generalized anxiety disorder (GAD) (Roberge et al., 2015). Results from the Dialogue project showed that 52.5% of the sample was identified as having GAD in the past 12-months by a healthcare professional using the Composite International Diagnostic Interview-Simplified (CIDI-S) (Roberge et al., 2015). These authors suggested that this high prevalence of GAD may be attributed to the high utilization of mental health services, persistent GAD symptoms and profiles of psychiatric morbidity, specifically with major depression (Roberge et al., 2015).

In China, the prevalence of GAD was low as assessed by the CIDI (Shen et al., 2006). Shen et al. (2006) report that 0.8% of the community sample met the diagnostic criteria for GAD. These authors suggested that the low prevalence rate may be because of stigma-related non-disclosure of mental health problems (Shen et al., 2006).

In Nigeria, the population-based study, the NSMHW, demonstrated a lifetime prevalence of 0.1% for GAD using the WMH-CIDI (Gureje et al., 2006). These authors however, found that the 12-month prevalence of GAD was zero (Gureje et al., 2006). Gureje, et al. (2006) argue that a possible reason for this finding may be that individuals who had only one source of worry did not meet the diagnostic criteria for GAD and were therefore excluded from this module of the WMH-CIDI.

In South Africa, results of the SASH study revealed a lifetime GAD prevalence rate of 2.7%, while the 12-month prevalence rate of GAD was estimated at 1.4% using the CIDI (Herman et al., 2009). Herman et al. (2009) conclude that compared with other countries in the World Mental Health survey, the 12-month prevalence rate of anxiety disorders were higher in South Africa. They also found that the following countries had higher rates of anxiety disorders than South Africa, namely, Belgium, France, Germany, New Zealand, the Netherlands, Colombia, Lebanon, and the USA (Herman et al., 2009).

Prevalence of GAD among PLWH. In the USA, 15.8% of HIV-infected individuals met the diagnostic criteria for GAD (Bing et al., 2001). Although anxiety disorders were not the focus of their study, Berger-Greenstein et al. (2007) made use of the SCID to assess the prevalence of GAD among an American sample of HIV-infected individuals. These authors reported a lower rate of 3.6% for GAD among HIV-positive outpatients in the USA (Berger-Greenstein et al., 2007).

Conversely, in low- and middle-income countries (LMIC) there is a paucity of research reporting on the prevalence of anxiety disorder in PLWHA. Using the MINI, the prevalence rate of GAD among HIV-infected individuals in Zambia was 13.3% (Van den Heuvel et al., 2013). Likewise, using the MINI, the prevalence of GAD was 11.4% among Nigerian HIV-positive individuals (Adewuya et al., 2007). However, the prevalence of GAD of 4.6% was lower among

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HIV-positive patients in South Africa using the MINI (Fincham, Smit, Carey, Stein, & Seedat, 2008). Even lower rates of GAD were found among 900 HIV-positive individuals (Freeman et al., 2007). Using the CIDI, Freeman et al. (2007) report the prevalence of GAD at 0.4%. A literature search reveals that no research has been conducted among persons seeking HIV testing to determine the prevalence of GAD. This is a gap in the research that this study seeks to address.

Prevalence of alcohol use disorders (AUD).

Prevalence of AUD in the general population. In order to report on the prevalence of alcohol use disorders, it is imperative to note that the DSM-5 combines the DSM-IV classifications of alcohol abuse and alcohol dependence into one specific disorder, namely alcohol use disorder (AUD) (APA, 2013). The lifetime prevalence of alcohol abuse as assessed by the DSM-IV Alcohol Abuse and Dependence in the USA was 17.8%, while the 12-month prevalence was 4.7% (Hasin, Stinson, Ogburn, & Grant, 2007). These authors further reported that the lifetime and 12-month prevalence of alcohol dependence was 12.5% and 3.8%, respectively (Hasin et al., 2007). In Canada, the prevalence of alcohol dependence in the general population was 4.1% (Caron et al., 2012). Furthermore, based on a total sample of 5443 drinkers in the Netherlands interviewed with the Composite International Interview (CIDI), the 12-month prevalence of DSM-IV and DSM-5 AUDs were 5.4% and 4.4%, respectively (Tuithof, ten Have, van den Brink, Vollebergh, & de Graaf, 2014).

However, the prevalence of alcohol abuse or dependence was lower in a Chinese population-based survey (Shen et al., 2006). Shen et al. (2006) utilized the CIDI and found that the prevalence for alcohol abuse or dependence was 1.6%. As previously mentioned, this low prevalence may be due to stigma-related non-disclosure of mental health problems (Shen et al., 2006). Another study in Beijing, China, made use of the CIDI and found that 32.5% of the sample had alcohol use disorder

(Xiang et al., 2009). Xiang et al. (2009) further reported that 4.3% of the sample met the diagnostic criteria for alcohol dependence in their lifetime, while 1.7% was diagnosed with alcohol dependence the previous 12-months (Xiang et al., 2009.

In the SASH study, the lifetime and 12-month prevalence of alcohol abuse and alcohol dependence was estimated using the CIDI within community settings (Herman et al., 2009). These authors reported a lifetime prevalence of alcohol abuse and alcohol dependence of 11.4% and 2.6%, respectively. Conversely, the 12-month prevalence of alcohol abuse and alcohol dependence was 4.5% and 1.2%, respectively (Herman et al., 2009). Among a cohort of 4 351 adults, using findings from the SASH study, the WHO/CIDI yielded a higher occurrence of alcohol use of 38.7% (Van Heerden et al., 2009).

Prevalence of AUD among PLWH. Several studies showed that the lifetime prevalence of alcohol use disorder, ranging between 26% and 60%, is higher among people living with HIV/AIDS than in the general population (14-24%) (e.g. Williams, Rabkin, Remien, Gorman, Ehrhardt, 1991; Waller, Lyons, Costantini-Ferrando, 1999; Samet, Phillips, Horton, Traphagen, & Freedberg, 2004; Kessler et al., 1994; Cook et al., 2001; Sullivan et al., 2008). Berger-Greenstein et al. (2007), making use of the SCID, found a high prevalence of 69.4% for alcohol abuse or alcohol dependence in 85 HIV-infected patients in the USA. In another study in the USA among 400 PLWHA, making use of the CIDI, a lower prevalence of 10% for alcohol dependence was found (Sullivan et al., 2008).

Nevertheless, in Lima, Peru, the prevalence rates of alcohol use disorders were lower among HIV-infected men who have sex with men (MSM) and transgendered women (TGW) (Ferro et al., 2015) than in the USA (Berger-Greenstein et al., 2007). Of the 302 Peruvian HIV-infected men who have sex with men (MSM) or transgendered women (TGW) screened with the WHO's validated 10-

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item alcohol use disorder identification test (AUDIT), 43.2% could be diagnosed with alcohol use disorders (Ferro et al., 2015).

In sub-Saharan Africa, it was estimated that among people living with HIV, the prevalence of alcohol abuse or dependence and other substances ranges between 7% and 16% (Brandt, 2009; Nel & Kagee, 2011). Further, in sub-Saharan Africa, alcohol use has an adverse impact on HIV risk in terms of condom use, number of sexual partners, intimate partner violence and the place of drinking (Woolf-King, & Maisto, 2011; Baliunas, Rehm, Irving, & Shuper, 2010; Shuper, Joharchi, Irving, Rehm, 2009; Chersich & Rees, 2010; Kalichman, Simbayi, Kaufman, Cain, & Jooste, 2007; Pithey & Parry, 2009). In a recent study in Zambia, the prevalence of alcohol dependence was assessed among TB and HIV-positive men and women making use of the MINI (O'Connell et al., 2013). O'Connell et al. (2013) estimated that the prevalence of alcohol dependence of 27.2% among men was higher than for women, with a rate of 3.9%. These authors also illustrate some limitations of their study and argue that no statements can be made regarding the severity of illness, in this case TB/HIV infections, and alcohol dependence, since this information was not reported in their study (O'Connell et al., 2013). Conversely, Adewuya et al. (2007) found a prevalence rate of 8.0% for alcohol abuse/dependence among their sample of HIV-infected individuals in Nigeria.

In South Africa, alcohol consumption was also found to be a contributing factor to HIV infection (Hahn, Woolf-King, & Muyindike, 2011). According to Myer et al. (2008), 1.0% of individuals within a South African sample had MINI-defined alcohol abuse disorder, while 6.0% had alcohol dependence.

Comparing the prevalence rate of alcohol abuse and dependence with other studies may be more complex due to differing sociodemographic factors, measuring tools and diverse alcohol

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measures (O' Connell et al., 2013). However, the incidence of substance abuse among HIV test-seekers in South Africa is not known.

The levels of psychiatric distress, depression, anxiety and alcohol use.

Psychological distress in the general population. Within the general population, the prevalence of psychological distress was found to range between 5% and 27% (Benzeval & Judge, 2001; Chittleborough et al., 2011, Gispert et al., 2003, Kuriyama et al., 2009: Phongsavan et al., 2006). For example, among cancer patients in the USA (n = 4496), the prevalence of distress was 31.5% using the Brief Symptom Inventory (BSI) (Zabora BrintzenhofeScoc, Curbow, Hooker, & Piantodosi, 2001). In another study among breast cancer patients in the USA, the prevalence of distress was estimated using the HSCL-25 (Coyne et al., 2004). Although the total mean score was 40.5 on the HSCL-25, which was less than the clinically significant cut-off point of 44, 29.2% of the sample scored above this cut-off point (Coyne et al., 2004). In a study conducted by Palmer, Taggi, DeMichele, & Coyne, (2012), elevated levels of distress were found using the HSCL-25 among female breast cancer patients. These authors reported that 33% of their sample scored above the recommended clinically significant cut-off point on the HSCL-25 (Palmer et al., 2012).

Furthermore, using the data from the MacArthur Foundation National Security of Midlife Development in the United States (MIDUS, Brim et 1996) Cochran, Sullivan and Mays (2003) estimated the prevalence of psychological distress. The prevalence of current distress was higher among gay or bisexual men (33.1%) than heterosexual men (12.5%) (Cochran et al., 2003). However, no significant difference in levels of distress was found between lesbian or bisexual women (18.4%) compared to heterosexual women (18.4%) (Cochran et al., 2003).

In South Africa, the symptoms of psychological distress were estimated using the Kessler-10 item scale (K-10) at two different cut-off scores (Peltzer et al., 2012). For example, in a study done by Peltzer et al. (2012) among tuberculosis (TB) patients, 32.9% of the sample reported that the symptoms of psychological distress were at or above the cut-off score of 28. However, 81% of the sample reported psychological distress at or above the cut-off score of 16 (Peltzer et al., 2012). Among hospital outpatients in South Africa, using the K-10, 17% of the patients had severe psychological distress and 14% reported moderate distress (Peltzer, Pengpid, & Skaal, 2012). Peltzer et al., (2012) also found in their sample that more women (19.4%) than men (15.5%) reported psychological distress. The SASH study revealed lower levels of psychological distress within community-based settings (Herman et al., 2009). The SASH reported that 11% of the sample had moderate levels (scores 20-24), while 8% of the sample showed even higher levels of psychological distress using the K-10 (Herman et al., 2009).

Among political detainees, 14.19% of the sample had elevated symptoms of psychological distress using the HSCL-25 (Kagee, 2005). In another study by Kagee (2008), the levels of psychological distress among 119 people living with a chronic illness such as diabetes and hypertension, were assessed using the HSCL-25. Kagee (2008) reports that 38.5% of the sample scored above the clinically significant cut-off point of 44 on the HSCL-25. Those individuals who scored above the recommended cut-off point of 44 had a high incidence of psychological distress (Kagee, 2008). In conclusion, a possible explanation for the high rates of psychological distress may be that desirable responses may have been given when using the K-10. Caution should be exercised when interpreting the results of self-report measures (Peltzer et al., 2012).

Psychological distress among PLWH. In a study done by Blais et al. (2015) in Quebec, Canada, the Quebec Population Health Survey (Deschesnes, 1998) was used to determine

psychological distress among mothers living with HIV (MLHIV). A total score at or above 26.19 indicates high levels of distress and the scale had high internal consistency ranging between 0.84 and 0.87. (Blais et al., 2015). Blais et al. (2015) found that 45% of their sample had psychological distress. Cohen et al. (2002) made use of the Distress Thermometer (DT) (Holland, 2000) to measure the prevalence of psychological distress among 101 HIV-positive individuals in the USA. The Distress Thermometer (i.e., >5, 0-10 scale), validated by the National Comprehensive Cancer Network (NCCN) (2010), is a visual analogue scale consisting of one item and have been used in various studies among individuals with a medical condition such as breast cancer (Hegel et al., 2006; Ransom, Jacobsen, & Booth-Jones, 2006). Cohen et al. (2002), report that 72% of the sample had high levels of distress. These authors further argue that the level of distress may be due to the fact that high prevalence of psychiatric disorders in the population sample were already present prior to the evaluation of distress (Cohen et al., 2002).

In Tanzania, 57% of people living with HIV scored above the recommended cut-off point of 44 on the HSCL-25, which indicates a high disturbance of psychological distress (Antelman et al., 2007). In South Africa, the level of psychological distress among people living with HIV was also assessed using the HSCL-25 (Kagee, & Martin, 2010). These authors reported that the sample mean score of 47.54 on the HSCL-25 was higher than the recommended significant clinical cut-off point of 44. Subsequently, 52.9% of their sample scored in the elevated range on the HSCL-25. This high prevalence rate of clinically significant distress is a cause for concern as it may have an adverse effect on the quality of life of HIV-positive individuals (Kagee, & Martin, 2010). In another study in South Africa, 33.4% of the sample of people living with HIV scored in the clinically significant range of the EQ5D (Hughes, Jelsma, Maclean, Darder, & Tinise, 2004).

Symptoms of depression in general. Even though major depression has been documented in many studies internationally and locally, the symptoms of depression may have an adverse effect on the quality of life of individuals (Herrman et al., 2002; Mitchell, & Coyne, 2007; Ramirez-Avila et al., 2012). In a population-based study among individuals with epilepsy, the HADS was utilized to assess the extent of depression in Cardiff, Wales (Mensah, Beavis, Thapar, & Kerr, 2006). Mensah et al. (2006) show that 11.2% of the sample scored at or above the cut-off point of 8 on the HADS, which indicates depression. The HADS was used again in a study done by Collins, Corcoran and Perry (2008) among diabetic patients in Ireland (n = 1456) to assess the symptoms of depression (Collins et al., 2008). These authors found that 12.3% of their sample fell in the mild to moderate range on the HADS, while 8.0% of the sample fell in the moderate to severe range (Collins et al., 2008).

In India, the prevalence rate of depression was 14.6% as estimated by the Patient Health Questionnaire (PHQ-9) community-based sample (n = 1900) (Shidhaye, Gangale, & Patel, 2016). Likewise, in a large population-based study conducted in South India, using an adapted version of the PHQ, 15.1% of the sample scored above the clinically significant cut-off point on the PHQ (Poonothai et al., 2009). In another study in India, the Hospital Anxiety and Depression Scale (HADS) was used to determine depression among 150 HIV test seekers (Sahay et al., 2007). Sahay et al. (2007) convey that 45% of their sample of HIV-test seekers was depressed. In China, the community-based study among adults with type 2 diabetes, the levels of depressive symptoms were calculated using the Zung Self-Rating Anxiety and Depression Scales (Sun et al., 2016). These authors found that 56.1% of the sample was classified with depressive symptoms (Sun et al., 2016). Using the PHQ among 1285 individuals from the Federation of Bosnia and Herzegovina, with the majority from Republika Srpska, 17% of the sample had depressive symptoms (Broers et al., 2006).

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In Uganda, the BDI was utilized to determine the prevalence of depressive symptoms in two districts, namely Adjumani and Bugiri (Ovuga, Boardman, & Wasserman, 2005). Overall, 17.4% of the sample in the general population scored in the clinically significant range on the BDI (Ovuga et al., 2005). Also, in South Africa among chronically ill patients, 19.8% of the sample fell in the elevated clinically significant range on the BDI (Kagee, 2008).

Symptoms of depression in PLWH. In Australia, among 100 people living with HIV/AIDS (PLWHA) a cut-off score of 14 or above on the BDI was used to detect depression (Judd & Mijch, 1996). Judd and Mijch (1996) report that 44% of the sample scored above the cut-off point of 14 on the BDI and were diagnosed as depressed. Even higher rates of depressive symptoms were found among 289 HIV-positive individuals in Canada, as assessed by the CES-D (Lima et al., 2007). Lima et al. (2007) found that 51.0% of the sample was categorized as having depressive symptoms. Another study in Australia made use of the Inventory to Diagnose Depression (IDD), a 22-item self-report measure, to determine syndromal depression (Komiti et al., 2003). These authors found that 21.7% of the sample of PLWHA met the criteria for syndromal depression (Komiti et al., 2003), which was lower than that of Judd and Mijch (1996) and Lima et al. (2007).

The prevalence rates of depressive symptomatology have also been reported among HIV-infected patients in the developing world. For example, a study by Campos, Bonolo, & Guimarães, (2006), the Adherence to Antiretroviral Therapy (ATAR), made use of the HADS to assess the level of depression among HIV-infected individuals in Brazil. Campos et al. (2006) report that 21.8% of the sample scored in the moderate to severe range on the HADS before ART treatment. These results allowed Campos et al. (2010) to conduct another study among 293 HIV-infected patients to determine whether elevated depression symptoms during the onset of an ART treatment regime may lead to non-adherence. A high prevalence rate of 40.6% for depression symptoms was found in

the sample using the HADS (Campos et al., 2010). These authors further found no significant relationship between depression and non-adherence, which may be a consequence of low statistical power considering a sample size of 17.

In Delhi, India, the Centre for Epidemiological Studies Depression (CES-D) scale was utilized to determine the levels of depression among 160 people living with HIV and receiving ART treatment (Bathia, & Munjal, 2014). The results indicated that 58.75% of the sample met the criteria for depression. Furthermore, more females (61.3%) than males (58.1%s) and transgender persons (50%) were depressed (Bathia, & Munjal, 2014). In China, the Chinese version of the BDI was utilized to determine the severity of symptoms among people living with HIV (Su et al., 2013). Su et al. (2013) report that the mean score of the C-BDI-II was 22, which was indicative of moderate depression. These authors also found that 24.0% of their sample scored in the moderate range on the C-BDI-II (Su et al., 2013).

For example, in Tanzania, Ramadhani (2007) found that 21% of the sample of HIV-infected individuals was diagnosed with depression using the HSCL-25. Ramadhani (2007) further reports that those individuals with depressive symptoms were not adherent to ART, whereas those without depressive symptoms were probably adherent to ART. In Botswana, the extent of depressive symptoms was assessed with the BDI and 31.8% of the sample scored in the moderate to severe range (Do et al., 2010). Using the BDI-I, rates of depressive symptoms were estimated among HIV-infected individuals to be 37.6%, suggesting that the sample of HIV-positive patients scored in the moderate range of the measure (Kagee & Martin, 2010).

In South Africa, the symptoms of depression were assessed using the BDI-I among people living with HIV (Kagee & Martin, 2010). On the BDI, the mean score of 16.45 indicated that the sample fell in the mild to moderate range. These authors further indicated that 24.70% of their

sample scored in the mild to moderate range on the BDI (Kagee & Martin, 2010). It is likely that these elevated levels of depression may negatively impact adherence to antiretroviral therapy (Walkup, Wei, Sambamoorthi, & Crystal, 2008; Kagee & Martin, 2010). In fact, it has previously been shown that those HIV-positive individuals who have received treatment for their depression were more adherent than those who did not receive treatment (Dalessandro et al., 2007; Kagee & Martin, 2010, Safren et al., 2012).

Furthermore, few studies have assessed the prevalence of major depression among persons seeking HIV testing (e.g. Rochat et al., 2006; Sahay et al., 2007). Notably, Rochat et al. (2006) investigated the prevalence of major depression among pregnant women before the receipt of an HIV test result in Kwa-Zulu Natal. Using the EPDS, the prevalence of MDD was 41% among their sample (Rochat et al., 2006). The more recent studies of Ramirez-Avila et al. (2012) and Cholera et al. (2014) examined the prevalence of depressive symptoms rather than obtaining a clinical diagnosis among persons seeking HIV testing. Both of these studies used self-report screening tools to measure the presence and intensity of depression symptoms, but did not assess the diagnostic criteria for major depression. Therefore, little is known about whether individuals are already psychologically distressed prior to the receipt of their HIV-positive result.

Symptoms of anxiety in general. In the context of the symptoms of anxiety, a study done by Wittchen (2002) in Germany made use of the Generalized Anxiety Screening questionnaire (GAS-Q). Wittchen (2002) reported that 21.7% of their sample had elevated levels of anxiety. Among a sample of 133 individuals recruited from an anxiety and treatment centre in the USA, the BAI was used to assess the extent of anxiety symptoms (Leyfer, Ruberg, & Woodruff-Borden, 2005). The total mean score of the BAI was 12.3, which indicated minimal anxiety (Leyfer et al., 2005). In Ireland, the HADS was used to measure anxiety among diabetic patients (n =1 456) (Collins et al.,

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2008). According to Collins et al. (2008), 16.9% of the sample fell in the mild to moderate range on the HADS, whereas 10.3% of the sample fell in the moderate to severe range on the HADS.

In China, among type 2 diabetic patients, the Zung Self-Rating Anxiety and Depression Scales were utilized to assess the symptoms of anxiety (Sun et al., 2016). Sun et al. (2016) found that in their community-based study that the level of anxiety was 43.6%, which was lower than that of Sahay et al. (2007). These authors argue that the discrepancy may be due to varied sampling methods or screening instruments and different living habits (Sun et al., 2016). In Nepal, among a specialized group of internally displaced persons (IDPs), 80.7% of the sample scored above the recommended cut score on the HSCL-25 which indicate elevated levels of anxiety (Thapa & Hauff, 2005). The factors associated with these anxiety symptoms include feeling unhappy when arriving at a new place and illiteracy (Tapa et al., 2005). Although anxiety appears to have an adverse effect on the quality of life, personal welfare and health outcomes of individuals, it is an under-researched psychological disturbance (Antony & Stein, 2009; Kagee, Coetzee, Saal, & Nel, 2015). Furthermore, using the anxiety subscale of the HSCL-25, the mean score of 20.95 indicated that the sample of South African chronically ill patients reported elevated symptoms of anxiety (Kagee, 2008).

Symptoms of anxiety among PLWH. Numerous studies have reported the symptoms of anxiety as assessed by a range of measuring instruments among HIV-positive patients. For instance, an earlier study among African American HIV-positive sample found that the levels of anxiety were moderate when assessed with the Spielberger State-Trait Anxiety Scale (Coleman & Holzemer, 1999).

Using the Hospital Anxiety and Depression Scale, 43.2% of the HIV-positive outpatients in a hospital in Quebec, Canada was regarded as likely cases of anxiety with scores of 8 and above on

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the scale (Savard, Laberge, Gauthier, Ivers, & Bergeron, 1998). On the HADS, a score of 15 and above indicated that 21.6% of the sample was probable cases of anxiety disorder (Savard et al., 1998). Comparably, in a more recent study than the above two, the levels of anxiety were measured using the Beck Anxiety Inventory (BAI) among 98 HIV-infected individuals in Vermont, New Hampshire (Gonzalez, Solomon, Zvolensky, & Miller, 2009). Among this sample, a total mean score of 16.21 was indicative of mild to moderate anxiety symptoms (Gonzalez et al., 2009).

The levels of anxiety were also reported in LMIC among people living with HIV. For example, among a sample of people seeking HIV testing in Goa, India (Mayston et al., 2013), the levels of generalized anxiety were measured using a modified version of the Patient Health Questionnaire in combination with the Generalized Anxiety Scale and the panic disorder module (Spitzer, Kroenke, & Williams, 1999). The prevalence of generalized anxiety symptoms among this sample of people coming for HIV/AIDS testing was 1.1% (Mayston et al., 2013). Furthermore, Sahay et al. (2007) have shown that a higher prevalence of anxiety was found among a sample of 150 HIV test seekers in India. They found that 62% of the sample had anxiety as assessed by the HADS (Sahay et al., 2007).

Little research has been done to assess the extent of anxiety symptoms among people living with HIV in sub-Saharan Africa. In addition, a limited number of self-report measures have been used in sub-Saharan to identify the elevated levels of anxiety among HIV-infected individuals. The screening instruments included are the EPDS (e.g. Rochat et al., 2006), the HSCL-25 (Kagee, 2010), and the Center for Epidemiological Studies Depression Scale (CESD) (e.g. Myer et al., 2008). The BAI, on the other hand, is the least documented screening instrument in sub-Saharan Africa.

A possible explanation for this may be that treatment for HIV has become more accessible in recent years. Consequently, HIV has become less life threatening, which may explain the lower rates of anxiety symptoms among HIV-positive individuals (Kagee et al., 2015). However, data regarding the rates of anxiety among people seeking HIV testing in South Africa are limited.

Symptoms of alcohol use in general. In Ireland, the prevalence of hazardous alcohol consumption (HAC) was assessed among university students using the Alcohol Use Disorder Identification Test for Consumption (AUDIT-C) (Davoren, Siely, Byrne, & Perry, 2015). Among the Irish university students (n = 2275), the prevalence of HAC was 66.4% (Dovoren et al., 2015).

In the general population, it has also been shown that the identification of alcohol use disorders is poor on the LMIC (Pal, Yadav, Joy, Mehta, & Ray, 2003; Patel et al., 2007). For example, a study among 1 285 individuals from the Federation of Bosnia and Herzegovina and from Republika Srpska assessed the levels of alcohol use using the PHQ (Broers et al., 2006). Broers et al. (2006) reported that the levels of alcohol use were 5.0%.

In an urban hospital in South Africa, harmful or hazardous drinking was assessed using the AUDIT (Pengpid, Peltzer, & Van Den Heever, 2011). Among the sample of 1532 patients, the findings showed that 41.2% of men, while 18.3% of women were hazardous drinkers.

Symptoms of alcohol use among PLWH. In the context of alcohol use and HIV, previous studies have showed that an infection with HIV is associated with alcohol use (e.g., Ayisi et al., 2000; Shishana et al., 2005). In a rural town in Louisiana, USA, the CAGE (Cut down, Annoy, Guilty and Eye-opener) index was used to assess the number of PLWHA with a problem with drinking (Mohammed et al., 2004). Mohammed et al. (2004) found that 12.8% of the PLWHA were binge drinkers and 12.8% were problem drinkers. Similarly, among an Indian sample of people

coming for HIV/AIDS testing, the level of harmful alcohol use was 12.8% as assessed by the AUDIT (Mayston et al., 2013).

A systematic review of published research by Fisher, Bang, and Kapiga (2007), established that alcohol drinkers in Africa had considerably higher odds of being HIV-positive. In Nigeria, the levels of hazardous drinking in HIV-positive individuals were assessed using the AUDIT (Farley et al., 2010). Farley et al. (2010) report that 12% of their sample scored above the recommended cut-off score of eight on the AUDIT, which suggests hazardous or harmful alcohol use (Farley et al., 2010). This prevalence rate was higher than that demonstrated in a study assessing MINI-defined alcohol abuse or dependence among HIV-positive individuals (Myer et al., 2008) rather than harmful/hazardous drinking (Farley et al., 2010). Another study in South Africa made use of the AUDIT to assess harmful or hazardous alcohol use among 1503 HIV-infected patients attending HIV clinics in the Western Cape, South Africa (Kader, Seedat, Govender, Koch, & Parry, 2014). Kader et al. (2014) reported that 37% of the sample was hazardous or harmful alcohol drinkers. A plausible reason for this high prevalence rate may be that South Africa, compared to the rates worldwide, has one of the highest rate of per capita consumption per drinker (Kader et al., 2014).

Risk factors associated with CMDs. It has been shown that poverty and high levels of economic stress has consistently been associated with depression in LMIC (Husain, Creed, & Tomenson, 2000; Mirza & Jenkins, 2004; Patel et al., 2007; Rahman & Creed, 2007). A recent systematic review (Lund et al., 2010) of poverty and CMDs in low and middle income countries indicates that poverty, as shown by social exclusion, high stressors, reduced social capital, malnutrition, and increased violence and trauma can be positively linked to increased risk of CMDs (Lund et al., 2010).

It has also been found that more men tend to report low levels of CMDs than women do (Cohen, 2001; Cwikel et al., 2008; Havenaar, Geerlings, Vivian, Collinson, & Robertson, 2008; Lu et al., 2008; Sawyer, Pfeiffer, & Spence, 2009). Cohen (2001) found that the potential vulnerability of women in Pakistan, have CMD rates ranging between 45% up to 66%, whereas men have rates ranging between 15% up to 25%. These studies are, however, related to several factors. For instance, a study in Uganda found that women in polygamous marriages are more likely to be distressed than their male partners, for whom the presence of more than one partner is protective (Abbo et al., 2008). However, a study in India found no association between gender and rates of CMDs (Pothen et al., 2003). Furthermore, several factors related to gender have been found to be associated with psychiatric morbidity. These factors include worries over employment and finances in men, while in women the worries are more likely to be about troubled family relationships and infertility (Cohen, 2001; Hall & Williams, 1987).

Literature suggests that a lack of education or poor education is a risk factor for CMDs in low and middle-income countries (Patel & Kleinman, 2003). The reason for this is that lack of education or poor education are related to unemployment, low paying jobs and poverty, which are consequently associated with CMDs. The prevalence of psychiatric disorders is also associated with the social drift and social causation hypotheses (Dohrenwend, 1998). The social drift hypothesis indicates that elevated rates of psychiatric disorders are high in low socioeconomic status (SES) groups because of the ability of these individuals to change their status. In contrast, the social causation theory suggests that the risk for a mental disorder is high in low SES individuals because of the stressful social environments in which they live (Dohrenwend, 1998).

Research in South Africa has shown an increasing vulnerability amongst women generally and specifically during pregnancy. Studies have shown high rates of gender inequality and intimate

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partner violence during pregnancy (Dunkle et al., 2004), related in turn to depression and risk of HIV (Jewkes et al., 2008). In a South African study, women were more likely to have mood and anxiety disorders, whereas men showed an elevated risk for depression (Stein et al., 2008). Men were also more likely associated with substance use disorders, such as alcohol use disorder, than women (Stein et al., 2008).

Summary of common mental disorders in the global and sub-Saharan context. Despite the epidemiological research on common mental disorders, there is still ambiguity about the numbers of adults who have these disorders among people seeking HIV testing. There are also limited studies that have assessed the prevalence of common mental disorders in low-and middle-income countries.

Yet, it appears that people in low- and middle-income countries have a greater likelihood of being diagnosed with common mental disorders compared to high-income countries. Therefore, further research is needed to expand on the knowledge of prevalence and incidence of CMDs in the current study's population of interest.

The majority of the studies in the review indicate that self-report measures yielded higher prevalence estimates than diagnostic interview schedules such as the SCID. However, it is more difficult to compare the results because of the varying measurement techniques used, or the duration of the assessments. Additionally, the study populations also ranged from primary care or medical population-bases and HIV samples, which have an impact on the prevalence rates as well. Methodology-comparable research studies and the use of common, standardized instruments are warranted so that comparisons can be made among samples. In this way, the evidence can be used for mental health policy reform, and implementation of appropriate psychosocial interventions (Collins et al., 2010; Petersen & Lund, 2011; Brandt, 2009).

Regarding gender, women tend to report CMD symptoms more often than men do. The higher prevalence rate of CMDs among women ranges between 45% and 60% in Pakistan compared to 15% and 25% among men (Cohen et al., 2001).

The majority of the studies documented were cross-sectional, therefore more longitudinal studies are needed to report the causal relationship between mental health disorders and HIV. The studies reported in the review have examined the prevalence of CMDs prior to the receipt of a HIV-positive test results, and CMDs after an HIV diagnosis (Martin & Kagee, 2011, Olley, 2006). However, it is not known whether a psychiatric disorder or alcohol use disorder may be a risk factor for becoming HIV infected or if an HIV diagnosis is a risk factor for developing a psychiatric disorder.

Research Gaps

A review of the literature shows that a great number of epidemiological studies identifying common mental disorders such as depression and anxiety often include people living with HIV. However, limited knowledge is available that may contribute to the detection and treatment of these individuals seeking HIV testing. Furthermore, imperfect research is available in South Africa regarding the effectiveness of self-report measures in predicting CMD caseness or non-caseness. In this way, the current study will be informative on whether self-report measures can be used as proxies in identifying psychiatric disorders.

Given the above background, the study now proceeds to answer the question whether CMDs among people seeking HIV testing are higher than in the general population. In answering this question, several sub-questions also have to be answered (refer to Chapter 1, p.6). The next chapter discusses the methodology of the current study.

Chapter 3: Research Methodology

Introduction

This chapter describes the research design and methodology used to examine the prevalence of common mental disorders, the effectiveness of the BDI, BAI, HSCL-25 and AUDIT against the SCID as gold standard, and the prevalence of general distress among persons seeking HIV testing. The procedures of data collection (i.e. measurement instruments), capturing and data analysis are presented here.

Research design

The study was cross-sectional and involved the use of quantitative research methods.

Study sites

The study was conducted among individuals seeking HIV testing at five non-profit organizations (NPOs) in the Cape Metropole district of the Western Cape, South Africa.

Cape Metropole district. The research was conducted in the Cape Metropole district, also known as the City of Cape Town Metropolitan Municipality in the Western Cape, South Africa (Figure 1). The Western Cape, situated in the southwestern part of the country, consists of six municipal districts. The Cape Metropole district is estimated to have a population of 3 740 026 (Statistics South Africa, 2011). The biggest group within the population is Coloured (42.4%), followed by Black African (38.6%), White (15.7%) and Indian (1.4%). The predominant language is Afrikaans (35.7%), followed by Xhosa (29.8%) and English (28.4%). The Cape Metropole region has an annual population growth of 2.57% (Statistics South Africa, 2011).

The unemployment rate is estimated at 23.9%, with an average household income between

R38 201 - R76 400 per annum. In addition, 38.2% of these households are female-headed

households (Statistics South Africa, 2011).

Figure 1   Map of the City of Cape Town Metropolitan Municipality

The five NGO sites. Testing is organized by the Department of Health and outsourced to five

non-profit organizations (NPOs) in the Cape Metropole districts. These include Living Hope,

Masincedane, Reliable Action, Sizophila, and Phambili.

Living Hope. Living Hope wellness centre is located in Mfuleni and is staffed by a registered

nurse and four counsellors. The centre is funded by the Desmond Tutu TB Centre (DTTC) at

Stellenbosch University. The healthcare services provided to the surrounding communities include

HIV and tuberculosis (TB) testing, and sexually transmitted infections (STIs) screening. In order to

assist the government in their efforts to promote HIV awareness and education, the counsellors are

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required to test a minimum number of new patients every month. Last year, 17 630 people were tested, of which 2.2% tested HIV positive.

Below is a picture of the Living Hope premises in Mfuleni.

Figure 2　　Living Hope, Mfuleni

Masincedane. Masincedane wellness centre, also funded by the Desmond Tutu TB Centre (DTTC), is located in Somerset West. The services provided to the surrounding community include HIV testing and counselling, TB screening, blood glucose examining, youth support sessions, blood pressure testing, condom distribution, pregnancy testing, and family planning. During the last six months of 2013, the staff provided HIV VCT services to 1 746 clients. The majority of these clients were men.

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Figure 3   Masincedane, Somerset West

Reliable Action. Reliable Action is a non-profit organization operating in Eersterivier that focuses on prevention and awareness, voluntary testing, counselling and support. The staff members consist of five lay counsellors and a registered nurse. Reliable Action is funded by the Department of Health of the Western Cape. The healthcare services provided are trauma counselling, blood pressure testing, blood glucose testing, BMI (Body Mass Index), pregnancy testing, family planning, outreaches at schools, corporate companies and shopping malls. In 2014, 95 025 people were tested for HIV as opposed to 59 777 in 2013.

Please see below images of the site.

Figure 4   Reliable Action, Eersteriver

Sizophila. Sizophila (meaning "we will have life!") is located at the Methodist Church Building in Broadlands, Strand. Services delivered include HIV testing and counselling, eye screening, TB screening, family planning, blood pressure testing, blood glucose and cholesterol monitoring, pregnancy testing and condom distribution. Sizophila Wellness Centre is in collaboration with the Masincedane Community Services and the Western Cape Department of Health. The staff members engage in regular outreach to communities by means of door-to-door visits.

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Figure 5   Sizophila, Strand

Phambili. Phambili centre in Broadlands Park, Strand, provides health and wellness services to all individuals in the wider Broadlands Park community. The services rendered by Phambili include the following: dental care, HIV testing and counselling and eye testing. The Department of Health and 11 Rotary clubs, some local and some international, fund this centre. They also received a grant from Rotary International 2012.

Figure 6   HIV-testing campaign

These sites were selected because they provide HIV counselling and testing to individuals seeking an HIV test result. Furthermore, the proximity of the sites to the residential areas in the Cape Metropole district made it accessible to the residents. Potential participants access healthcare services at the abovementioned testing sites or during routine outreach activities, such as caravans and tents that are set up by the counsellors in the community. These caravans and tents are also placed at shopping centres, train and taxi ranks, in business settings and in open spaces in public.

Preparation of the healthcare environment. Prior to the start of the research, steps were taken to confirm that the healthcare environment was adequately prepared for the study. This included reaching agreement on how the research process could be implemented within the wellness centres with minimal interference. For example, it was decided that refreshments such as coffee, juice or biscuits as a token of appreciation would not be appropriate because it can create false expectations of what the practice would be after the research has concluded. The individuals may believe that this is a normal daily routine of the testing sites. However, after much deliberation with the staff members and with consideration of ethical measures, it was decided that a grocery voucher may be given to prospective participants. The research team also had to make it abundantly clear that participants will only receive the grocery vouchers at the end of the interview process and those individuals who decline to take part will not receive a voucher.

Study Preparation

Training of the interviewers. Qualified clinical interviewers in the persons of Prof S.A. Kagee and Dr J. Bantjes, trained all the data collectors in administering the structured clinical interview for the DSM-V (SCID). The data collectors consisted of five postgraduate psychology students, including myself. A significant focus of the training was on developing interview skills so that interviewers would be able to elicit information from patients about their psychiatric symptoms.

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Interviewers were also trained to use their clinical judgement to make decisions about whether each symptom was present or not.

The research team, of which I was a member, attended a two-day training workshop to view SCID training DVDs. It was an eleven-hour course on using the Structured Clinician Interview for DSM-IV Axis I Disorders. We only viewed the DVDs relevant to the SCID modules used in our study.

Following this, group SCID sessions were conducted periodically, where the SCID was administered by one interviewer, while the other SCID interviewers observed. These exercises helped to ensure that all of the SCID interviewers were in agreement with respect to their understanding of the DSM-5 diagnostic criteria and SCID methodology.

Pilot testing. For the purposes of piloting, ten men and women seeking HIV testing were recruited from five non-profit HIV testing sites through convenience sampling. The revised version of the SCID was administered to the participants. Those participants who consent to participate in the study were required to give written consent and were supplied with an information leaflet explaining the project. The participants in the pilot study were assured of their anonymity and the confidentiality of their participation in the pilot study.

The purpose of the pilot testing was multiple:

- It afforded the research assistants learning opportunities to practice the full assessment battery and to monitor through observation and supervision. They practiced aspects such as mastery of interview skills for all assessment items, probing skills and they could gauge the time it took to deliver the assessment battery.

- The researchers could detect and correct errors and ambiguities in the SCID and the self-report questionnaires, for example, grammatical errors, notes to the interviewers that were not clear enough and technical errors associated with the electronic version of the SCID (i.e., the skip out function not working properly), etc.

- The interviewers had a chance to detect layout and presentation problems that could lead to the misinterpretation of questions or statements.

- The researchers could evaluate the feasibility of the study within the wellness centres.

- The researchers were able to determine the amount of time it takes to conduct the interview.

- The researchers could determine the receptivity of participants to the interview questions.

The pilot study was considered important in improving the degree to which the interview questions could obtain the required information from the participants.

1   An introductory sentence was included in the beginning of the interview to establish a repertoire between the interviewer and the interviewee.

2   Notes to the interviewer were included to inform the interviewer on how to handle that specific question.

Study Procedure

Participants. Participants were enrolled in the study by means of convenience sampling prior to undergoing HIV testing at the five above-mentioned non-medical HIV-testing sites in the Western Cape region of South Africa. The type of HIV testing accessible was the finger-prick rapid test, which is very fast and convenient to use. Convenience sampling is an example of non-

probability sampling, in which the participants are conveniently available to participate in the study (Cant et al., 2008). Cant et al. (2008) observe that the advantage of convenience sampling is that it is convenient, cost effective and the least time consuming sampling method. The biggest disadvantage of convenience sampling, on the other hand, is the possibility for sampling bias in that those participants recruited may not be reflective of the population of interest (Cant et al., 2008). An example of sampling bias in the current study would be if only young female participants were approached. A possible way to manage sampling bias would be to recruit as many diverse sub-groups as possible (i.e. different genders, age groups, etc.) from the population of interest (Cant et al., 2008). Probability sampling, on the other hand, means that participants have an equal chance of being selected. Probability sampling was not used in the current study since it is more time consuming and costly than non-probability sampling (Tyler & Heyman, 2016). In this study, the participants were eligible to participate in the study based on the following inclusion and exclusion criteria:

Inclusion criteria

i   At least 18 years and older;

ii   Testing for HIV (first time test-seekers and repeat test-seekers), and willingness to receive their HIV results;

iii   A comprehensible understanding of English;

iv   Also, a sufficient capacity to consent.

Exclusion criteria

i.   Not meeting the minimum age criteria of 18 years and older to consent to participate;

ii.   Not willing to test for HIV, or not willing to receive their HIV results;

iii.   Already aware of their HIV-positive status prior to consent, or receiving ART treatment;

iv.   Not having sufficient capacity to consent.

v.   Floridly psychotic

Recruitment procedure. After registration at reception, those individuals coming for HIV testing received a flyer briefly describing the research and encouraging them to meet with the researcher in a private room or a tent or caravan at each testing site. Those who were interested in meeting with the researcher were informed about the study in more detail and were asked to participate in the study before undergoing HIV testing. Although English was not the first language of a majority of the participants, all but a few HIV test-seekers who were interested in meeting with the researcher were able to understand English. If a potential participant was not conversant in English, he or she was excluded from the study. In this context, 40 potential participants were not included in the study. The participants were expected to complete an informed consent form. Thereafter, they were administered the SCID together with a battery of self-report questionnaires. These measures were administered by the researchers after they had undergone training. The recruitment procedure was structured in this way to maximize the use of the participant's available time, without disruption of the healthcare services.

Ethical considerations. The study was granted ethical clearance by the Health Research Ethics Committee (HREC) at Tygerberg Hospital. The researcher informed the participant that any information given would be treated as confidential and that participation was completely voluntary. Participants could therefore refuse to take part in the study at any time during the course of the interview. After being given the opportunity to ask questions about the study, those who agreed to participate were asked to sign a consent form, indicating informed consent. The participants received a grocery voucher to the value of R50 as a token of appreciation for their participation. In

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line with ethics requirements, a referral protocol was developed to respond to moderate to severe cases of mental disorders. They were provided with referral letters with numbers of Stellenbosch facilities that provide mental health services. The following contact details were provided: (a) Idas Valley: Sister C. Nothling (psychiatric nurse) at 0218872721 or chanel.nothling@westerncape.gov.za; (b) Cloetesville: Sister N. Toffar (psychiatric nurse) at 021 883 2676 or ntoffar@westerncape.gov.za; (c) Stellenbosch Provincial Hospital - 021 887 0310; (d) Vlottenburg Mobile Clinic - 021 888 5825; (e) Kylemore Clinic - 021 885 2504; (f) Jamestown clinic - 021 880 1390.

Data collection methods and data analysis

Data collection. All questionnaires and the structured interview were administered in English. The interview and questionnaires took approximately sixty to ninety minutes to complete. The SCID was administered before the administration of the self-report questionnaires (demographic information, HSCL-25, BDI, BAI, and AUDIT). This sequence was chosen to account for the duration of the SCID modules to elicit more detailed responses. In this regard, the participants were able to understand their own mental health better. The participants also had the opportunity to ask for more clarity in the likelihood that they did not understand the terminology used. Although the SCID questions may have had an influence on the responses to the self-report measures, the participants' understanding of the questions on the self-report measures improved due to the SCID.

Socio-demographic questionnaire. The demographic questionnaire consisted of items that provide information on age, gender, race, marital status, education level, living situation, family income, first language, and employment status. This specific demographic information was helpful to determine whether some of the socio-demographic determinants are in association with the

prevalence estimates of CMDs. Furthermore, due to time constraints and resources available, variables such as previous HIV testing or past psychiatric treatment were not assessed.

Structured Clinical Interview for the DSM. The research version of the structured clinical interview for the DSM (SCID-R) (refer to Appendix I through Appendix K), developed by Spitzer et al. (1980), is a structured diagnostic interview used to establish DSM-IV Axis I disorders (major mental disorders) and Axis II personality disorders (First et al., 1997). The SCID-R has been utilized as the 'gold standard' in several studies to ascertain the precision of clinical diagnoses (Shear et al., 2000; Steiner et al., 1995).

The reliability of the SCID-R is reported in terms of Kappa statistic, which is a measure of inter-rater reliability or agreement (Lobbestael, Leurgans, & Arntz, 2010; Williams et al., 1992). Kappa statistic values above 0.70 are indicative of good inter-rater agreement, whereas values from 0.50 to 0.70 show moderately good agreement. Kappa values below 0.50 are suggestive of poor inter-rater agreement (Lobbestael, Leurgans, & Arntz, 2010; Williams et al., 1992). Williams et al. (1992) have found negative reliability results using the SCID due to poor inter-rater agreement on CMDs such as depression and substance abuse. However, recent studies (such as Zanarini & Frakenburg, 2001; Zimmerman & Mattia, 1999) have shown more consistent and positive results. The highest inter-rated agreement values were found by Skre, Onstad, Torgersen and Kringlen (2007) for the following different mental disorders: schizophrenia (0.94), MDD (0.93), dysthymia (0.88), GAD (0.95), panic disorders (0.88), alcohol use disorders (0.96) and other psychoactive substance use disorders (0.85).

The relevant modules of the existing SCID, which were anchored in the DSM-IV, were adapted by Professor S.A. Kagee and Dr J. Bantjes to match the diagnostic criteria of the DSM 5. This adapted version was compared with a draft version of the new SCID used by Dr M. First, with

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whom Professor S.A. Kagee has been in contact, and the language of the interview questions was further adapted. The final modified version of the SCID includes the following modules: screening questions, MDD (current and past); persistent depressive disorder; post-traumatic stress disorder (PTSD); acute stress disorder; GAD and adjustment disorder. For this thesis, only the following modules of the SCID-RV were used: major depressive disorder (current and past), persistent depressive disorder, generalized anxiety disorder, and alcohol use disorder (current and past). An electronic version of the SCID has been constructed for utilization on a web page (http://surveys.sun.ac.za). The interview data were recorded on Lenovo tablets and were then instantaneously imported into an Excel file and saved.

Hopkins Symptom Checklist. The 25-item Hopkins Symptom Checklist (HSCL-25) was used to determine psychological distress among the sample (refer to Appendix D). The HSCL-25 was obtained from the 90-item Symptom-Checklist (Derogatis, Lipman, Rickels, Ulenhuth, & Covi, 1974; Parloff, Kelman & Frank, 1954). The first ten items on the HSCL-25 assess symptoms of anxiety, while the remaining fifteen items on the scale assess depression (Mollica, Wyshak, de Marneffe, Khuon, & Lavelle, 1987). The depression score is correlated with major depression as delineated by the DSM-5 (APA, 2013; Mollica et al., 1987).

The level to which each symptom has upset the participant in the past month was rated on a four-point Likert-type scale, with 1 indicating "not at all", 2 indicating "a little", 3 being "quite a bit" and 4 "extremely" (Derogatis et al, 1974) and a mean score of 44 has been defined as the cut-off point to indicate clinically significant distress (Winokur et al., 1984). A high total score of the HSCL-25 is suggestive of significant levels of distress. The internal consistencies of the total scale ($\alpha = 0.93$), the depression subscale ($\alpha = 0.90$) and the anxiety subscale ($\alpha = 0.85$) were high (Kaaya et al., 2002).

The HSCL-25 was also used in studies conducted in South Africa such as those by Kagee (2005) and Van der Merwe (2005). For instance, Kagee (2005) evaluated the levels of psychological distress among former political detainees using the HSCL-25. The internal consistency of the HSCL-25 among this sample of former detainees as determined by Cronbach's alpha was 0.96 (Kagee, 2005). The same alpha value was found among individuals living with diabetes or hypertension (Kagee, 2008) and among people living with HIV (Kagee, & Martin, 2010). Furthermore, Coyne et al. (2004) reported that among their sample of breast cancer patients (n = 113), the HSCL-25 was a significant predictor of MDD ($\chi^2(1) = 8.83$, p< 0.05). The factor structure of the HSCL-25 yielded two factors (depression and anxiety) that explained 48% of the variance (Ventevogel et al., 2007).

Beck Depression Inventory. The Beck Depression Inventory (BDI) (refer to Appendix E) is a 21-item self-report measure that calculates the presence of the following indicators of depression: affective, cognitive, motivational, psychomotor and vegetative indicators (Beck, Steer, & Garbin, 1988; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). This self-reported inventory has each item rated with a set of four possible answers of increasing intensity. Each item is rated on a four-point scale, ranging from 0 to 3 (Beck, 2001). A total score of 10 or higher is the most widely used cut-off for significant depressive symptomology (Beck et al., 1991; Beck, 2001). The severity of depressive symptomatology is represented by the following cut-off scores: < 10 indicates none or minimal depression, 10-18 indicates mild or moderate depression, 19-29 indicates moderate to severe depression; and 30-63 indicates severe depression (Beck et al., 1988). Although the BDI has been utilized to assess the severity of depressive symptomatology, it was not created to establish clinical diagnosis (Bonilla, Bernal, Santos, & Santos, 2004).

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The internal consistency coefficient for the BDI as measured by Cronbach's alpha was high (r = 0.80) (Beck et al., 1988; Beck, et al., 1961) with internal consistencies ranging between 0.73 and 0.92, with a mean of 0.86. (Beck et al., 1988). Regarding psychiatric and non-psychiatric populations, high internal consistencies were found, with alpha coefficients of 0.86 and 0.81, respectively (Beck et al., 1988). Kagee (2008) also found a high internal consistency of 0.85 on the BDI among South African patients living with diabetes or hypertension. A similar internal consistency was found among people living with HIV (Kagee, & Martin, 2010). The factor structure of the BDI-II was assessed among 185 HIV-positive individuals receiving antiretroviral therapy in South Africa using exploratory factor analysis (EFA) (Kagee, Nel, & Saal, 2014). Three factors were obtained, which accounted for 47.29% of the variance (Kagee, Nel, & Saal, 2014).

Beck Anxiety Inventory. The Beck Anxiety Inventory (BAI) (refer to Appendix F) has 21 items and determines the severity of anxiety in psychiatric patients (Beck, Epstein, Brown, & Steer, 1988). The items on the BAI are rated due to how much the specific item bothered the individual in the past week. The items on the BAI represent the emotional, physical and cognitive symptoms of anxiety and can discriminate anxiety from depression (Beck et al., 1988). Each item on the BAI is can be categorized in terms of its four subscales: (1) subjective (e.g., "unable to relax"), (2) neurophysiologic (e.g., "numbness or tingling"), (3) autonomic (e.g., "feeling hot") or (4) panic-related (e.g., "fear of losing control") (Beck et al., 1988).

This four-point Likert-type scale ranges from 0 ("not at all") to 3 ("severely" – I could barely stand it) (Beck et al., 1988). The total score for all 21 items ranges between 0 and 63 points (Beck et al., 1988; Beck & Steer 1990). A total score of 0 - 7 on the BAI is indicative of mild anxiety, 8 - 15 is indicative of mild anxiety, 16 -25 indicates moderate anxiety, and 26 - 63 indicates severe anxiety (Beck et al., 1988; Beck & Steer, 1990).

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Furthermore, Beck et al. (1988) demonstrated that the BAI has high internal consistency (Cronbach alpha = 0.92). In a study by Kagee et al. (2015) among 101 adults receiving ART in clinics in the Western Cape, South Africa, the Cronbach alpha of the BAI was 0.89. The Cronbach alpha of a Xhosa version of the BAI was 0.92, indicating high internal consistency (Steele & Edwards, 2008). Exploratory factor analysis was used among 101 HIV-positive individuals in South Africa receiving ART's (Kagee et al., 2015). These authors found that a single factor structure accounted for 68.7% of the variance (Kagee et al., 2015).

Alcohol Use Disorders Identification Test. The Alcohol Use Disorders Identification Test (AUDIT) (refer to Appendix G) is a 10-item self-report measure designed by the WHO to assess hazardous alcohol intake and alcohol abuse and dependence in primary healthcare settings (Babor, Higgins-Biddle, Saunders, Monteiro, 2002; Saunders, Aasland, Babor, de la Fuente, & Grant, 1993). The AUDIT measures three domains, namely: (i) the quantity and occurrence of drinking (ii) the symptoms of alcohol dependence; and (iii) negative responses to the results of drinking (Babor et al., 2001). On the AUDIT a total score of 8 or more indicates hazardous and risky alcohol use and probable alcohol dependence (Babor et al., 2001). Some studies have shown that in both males and females, a cut-off score greater than 8 suggest hazardous alcohol dependence/abuse (Aalto, 2009; Pradhan et al., 2012; Moussas et al., 2009; Kaarne, Aalto, Kuokkanen, & Seppa, 2010; Saunders et al., 1993). Similarly, Babor et al. (2001) reported that a cut-off of 8 is potentially able to detect a significant number of hazardous and harmful drinkers.

The AUDIT has revealed high internal consistency, with a Cronbach alpha coefficient of 0.80 (Meneses-Gaya, Zuardi, Laureiro, & Crippa, 2009; Reinert & Allen, 2002). The internal consistency of the AUDIT was 0.81 among South African clinic attenders in the Cape Metropole region in South Africa. (Kadar, 2013). Confirmatory factor analysis among a South African cohort

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of 314 (77.3%) men and 92 (22.6%) women yielded a two-factor and three-factor model for the men (Morojele, Kekwaletswe, Nkosi, Kitleli, & Manda, 2015). However, CFA was unable to yield a one-factor, two-factor, or three-factor model for the women (Morojele et al., 2015).

Data Analysis

Sample size calculation. The sample size was calculated based on the estimates of previous studies. Kessler et al. (2009) found that a lifetime prevalence of mental disorders ranges between 18.1% and 36.1%, while the prevalence of mental disorders over a period of 12 months is 9.8-19.1%. Williams et al. (2006) report that the overall prevalence rate for mental disorders is 16.5%. Accordingly, by assuming 16.5% as an overall prevalence of mental disorders, a sample size of 348 was calculated by making use of Creative Research Systems survey software's sample size calculator (https://www.surveysystem.com/sscalc.htm). A margin of error (confidence interval) of 5%, and a confidence level of 95% were used.

The sample size of 348 is above the sample size of 150 HIV test seekers suggested by Sahay et al. (2007), and more than the sample size of 242 pregnant women used in the study by Rochat et al. (2006). The study was part of a longitudinal study that required a larger sample size of 500. This sample size of 500 is large enough to ensure sufficient power to produce useful results and to detect optimal sensitivity and specificity values.

Data screening and quality assurance. I set up the SCID and the self-report questions, as previously mentioned, on a web-based platform. This electronic version was used to conduct interviews with the assistance of a Lenovo tablet. After the interviewers reported the participants' responses on the Lenovo tablet, the data were immediately uploaded to the university's database to be reviewed at a later stage. The data were then exported and stored in an Excel spreadsheet format.

An integrity check of the data, for instance, checking for missing values and outliers, revealed some missing data. There are several reasons why the data were missing. First, the age of the participants was calculated using their ID numbers. Some participants forgot their ID's and the interviewers asked them to provide their ID numbers at a later stage but a few participants did not comply. It was then suggested that the interviewers asked the participants for their date of birth if they did not know their ID numbers. Second, one item of the GAD module of the SCID was not entered into the web-based survey. Fortunately, I was able to rectify this mistake by adding the item at a later stage. Third, the past alcohol use disorder (past AUD) module of the SCID was also not included in the web-based survey. After deliberation with my supervisor, the past AUD module was added at a later stage. Finally, some data were missing because the participants unintentionally skipped a few BDI items. Subsequently, data were lost as some of the BDI item responses were accidentally deleted when I tried to make changes to the matrix rows or columns of the web-based version of the BDI. Furthermore, those participants with no responses to the self-report measures were excluded from the study. A possible reason for these missing values could have been that the person decided to withdraw from the study in the middle of the interview.

As can be seen in Table 1, 11.8% of the participants did not have responses for the past AUD variable, and some items on the BDI (6.6%), GAD (4.60%) and age (2.8%) variables. The missing values were imputed using the Multiple Imputation (MI) procedure. Multiple imputation is a Markov Chain Monte Carlo procedure in which the missing values are substituted by $m > 1$ (typically small, 3-10) simulated versions (Shafer, 1999). In order to ensure that the repeated analysis of the same data would generate the same findings, I considered the Monte Carlo error of the results. The Monte Carlo error refers to the "standard deviation across repeated runs of the same imputation procedure with the same data" (White, Royston, & Wood, 2011, p. 387). The imputation

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model should contain all the variables that were in the analysis model (Schafer, 1997) to avoid bias. In this context, the variables that were included in the imputation model were the demographic variables, MDD (current and past), PDD, AUD (current and past), GAD and all the items of the self-report measures.

Table 1
Missing data

Missing variables	N_missing	%_missing	95% CI
Age	14	2.80%	[1.35, 4.25]
GAD	23	4.60%	[2.76, 6.44]
Past AUD	59	11.80%	[8.97, 14.63]
BDI Items	33	6.60%	[4.42, 8.78]

A complete descriptive analysis was performed on participants' demographic information. I took the following steps to ensure the quality of data collection in preparation for the data analysis: (1) All interviews were audio recorded for quality assurance during the course of data collection; (2) Several debriefing sessions were held to monitor data quality and to improve item responses; (3) following rigorous data preparation, the accuracy of the modified version of the SCID were checked for data analysis activities.

For this thesis, the data collected on the SCID were coded using the DSM algorithms and reduced to a CMD case or non-case dichotomous (0/1) score. The DSM algorithm was implemented within Excel as a function so that all responses to individual symptoms were reduced to the dichotomous score (0/1) labelled as CMD case or non-case. I finalized the algorithm, with the aid of a statistician, Dr Martin Kidd, to analyse the data. As the data became available, the algorithm was

incorporated to determine whether a person was a case for a common mental disorder or not.

Therefore, it was important to check and re-check the algorithm to ensure that reliable scores were

produced. To this extent, the statistician and I ensured that the algorithm correctly coded the

responses of the participants as either present (threshold) or absent (false).

Statistical procedure. Table 2 presents each area of investigation, the instruments that were used

and the analytic approach applied during the data analysis

Table 2
Data sources and analytic approaches

Area of enquiry	Instrument	Analytic approach
Prevalence estimates	SCID	Descriptive statistics
		95% Confidence interval
		Chi-square analysis
Screening	SCID	ROC analysis
	HSCL	Cut-off scores
	BDI	Sensitivity and specificity
	BAI	Negative and positive predictive values
	AUDIT	
	DUDIT	
Symptomatology	HSCL	Cronbach's alpha to assess internal consistency
	BDI	
	BAI	Descriptive statistics
	AUDIT	
	DUDIT	

The data were entered into SPSS version 23. The reliability of the different scales was

calculated using Cronbach's alpha. Prevalence estimates for major depressive, past depressive,

persistent depressive, generalized anxiety and alcohol use disorders were determined using the

SCID and a confidence interval of 95%. The data collected on the SCID were coded using the DSM algorithms and reduced to a dichotomous 0 (non-case) or 1 (case) score. The results were calculated frequencies (i.e., means and standards deviations). I also utilized a Chi-square test to compare the prevalence of major depression, persistent depressive, generalized anxiety and alcohol use disorder with gender.

Receiver operating characteristic (ROC) curve analysis. ROC curve analysis is the curve that represents all possible cut points yielding optimal sensitivity and specificity (Hanley, & McNeil (1982). ROC analysis was used to examine the ability of self-report measures to discriminate between common mental disorder (CMD) caseness or non-caseness (Zou et al., 2012). Thus, the ROC area under the curve (AUC) tells us about the appropriateness of the self-report measures, specifically the BDI, BAI, AUDIT, and the HSCL to predict caseness for major depressive, past major depressive, persistent depressive, generalized anxiety, and alcohol use disorder (Zou et al., 2012). It is recommended that values between 0.70 and 0.90 are suggestive of a useful screening measure (Fisher et al., 2003; Swets, 1988). The positive predictive value (PPV) and the negative predictive value (NPV) were also assessed (Zou et al., 2012). The advantage of ROC analysis is that the optimal cut-off point can be calculated for each case (Hajian-Tilaki, 2013). Furthermore, the AUC is not influenced by a decision criterion (Hajian-Tilaki, 2013). A disadvantage of ROC is that the ROC curve that best describes test performance in one population may not be exactly transferable to other populations ("Understanding Receiver Operating Characteristics Curves", 2014). Therefore, caution should be taken when different populations are compared with each other.

Sensitivity and Specificity. The data analysis examined sensitivity and the specificity of the screening instruments against the SCID as gold standard. Sensitivity and specificity of a questionnaire are associated with a random selection of a "decision threshold" or cut-off point (Zou

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et al., 2007). Sensitivity and specificity values were evaluated to determine the best cut-off point that would augment the number of true positive and true negative predictions of mental disorders (Zou et al., 2007). Furthermore, those individuals who score below the cut-off point have high sensitivity, but low specificity. A high cut-off point, on the other hand, indicates many false negative results. The sensitivity refers to the ability of the screening instruments to identify those individuals with the condition or disorder correctly (Zou et al., 2007).

$$sensitivity = \frac{\text{True positives}}{\text{True positives} + \text{False negatives}}$$

An ideal sensitivity of 100% indicates that all the patients have been diagnosed with the disease (Zou et al., 2012). A sensitivity of 80% suggests that 80% of the patients have the disease (true positives), whereas 20% of the patients go undetected (false negatives) (Zou et al., 2012). In the context of identifying those patients with a severe but treatable disease (e.g. cervical cancer), a high sensitivity would be of more importance.

Specificity. Specificity, on the other hand, refers to the capability of the test to correctly detect those patients who have not been diagnosed with the disease (Zou et al., 2007).

$$specificity = \frac{\text{True negatives}}{\text{True negatives} + \text{False positives}}$$

Therefore, a specificity of 100% is ideal to detect all patients (Parikh et al., 2008; Zou et al., 2012). A specificity of 80% suggests that 80% of the patients were correctly identified as not having the disease (Zou et al., 2012), while 20% of the patients who were diagnosed with the disease, did not have the disease (false positives) (Zou et al., 2007). Even though a test with 100% accuracy would be the ideal, a possible alternative would be to administer a subsequent test with low sensitivity/high specificity to those patients who screened positive on a screening instrument

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with high sensitivity/low specificity. In this example, all the false positive cases may be correctly identified as not having the condition or disease (Parikh, 2008). Notably, in situations where a test has to identify those patients without the disease, a high specificity is of importance (e.g. breast cancer).

Positive predictive value. The positive predictive value (PPV) is the percentage of patients with a positive test who score above the cut-off point and have the condition or disease (Parikh, 2008)

$$positive\ predictive\ value = \frac{\text{True positives}}{\text{True positives+False positives}}$$

Negative predictive value. The negative predictive value (NPV) is the percentage of patients with a negative test who scored below the cut-off point and truly do not have the condition or disease (Parikh, 2008).

$$negative\ predictive\ value = \frac{\text{true negatives}}{\text{true negatives+false negatives}}$$

The positive predictive value of the HSCL, BDI, BAI, and AUDIT depends on the prevalence of the major depressive, past depressive, persistent depressive and alcohol use disorder. If the prevalence rates are very low, even with high sensitivity and specificity values, a high number of positive test results will be false positives. For example, if the sample being tested included a high proportion of HIV-positive people, then the PPV would be high and the NPV would be low.

Chapter conclusion

The research framework used for the data collection was appropriate to address the research questions and to meet the aims and objectives of this dissertation. A structured clinical interview

and a battery of self-report measures was used to answer the research questions. The next chapter

presents the results of the thesis.

Chapter 4: Results

Introduction

This chapter describes the findings of each of the four research questions addressed in this study. The chapter begins with the demographic information of the sample. The prevalence of current major depressive, past major depressive, persistent depressive, generalized anxiety, and alcohol use disorders follows. Next, I compare the ability of the self-report measures to discriminate between caseness and non-caseness using the structured clinical interview for the DSM-5 as gold standard.

Multiple imputation for missing data

The missing values in the generalized anxiety and alcohol use disorder variables and the missing values on the Beck Depression Inventory (BDI) were imputed using the Multiple Imputation (MI) procedure. The Markov Chain Monte Carlo method of estimation was used to impute the missing data.

I created $m = 5$ imputations by means of data augmentation runs of 100 cycles each. The results of the imputation procedure are shown in Table 3 and Table 4. Both tables contain mean scores, the standard deviation values of the original dataset and the complete imputed dataset. During each cycle, the means and standard deviations were calculated to verify that the reiterations of the same data would produce the same answers (White, Royston, & Wood, 2011). These two datasets are very similar due to the low percentages of missing variables.

Table 3

Five imputations of the past alcohol use disorder and generalized anxiety disorder variables

	Original dataset		**Complete data after multiple imputations**									
			Iteration 1		Iteration 2		Iteration 3		Iteration 4		Iteration 5	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
AUD_ past	0.40	0.49	0.38	0.51	0.37	0.51	0.40	0.51	0.38	0.50	0.38	0.51
GAD	0.04	0.19	0.34	0.20	0.03	0.19	0.04	0.19	0.04	0.20	0.04	0.19

Table 4
Five imputations of the BDI missing variables

| | Original dataset | | Complete data after multiple imputations | | | | | | | | | |
| | | | Iteration 1 | | Iteration 2 | | Iteration 3 | | Iteration 4 | | Iteration 5 | |
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
BDI1	0.82	10.7	0.83	1.07	0.82	1.07	0.83	1.07	0.82	1.07	0.83	1.07
BDI2	0.97	1.11	0.97	1.12	0.96	1.11	0.97	1.11	0.97	1.11	0.96	1.12
BDI3	0.82	1.00	0.83	1.01	0.83	1.01	0.83	1.01	0.82	1.00	0.82	1.00
BDI4	0.78	0.85	0.79	0.85	0.79	0.85	0.79	0.85	0.79	0.85	0.79	0.85
BDI5	0.74	0.94	0.74	0.94	0.74	0.93	0.74	0.94	0.75	0.94	0.74	0.94
BDI6	0.97	1.18	0.97	1.18	0.97	1.18	0.97	1.18	0.97	1.18	0.97	1.18
BDI7	0.56	0.77	0.56	0.77	0.56	0.77	0.56	0.77	0.56	0.77	0.56	0.77
BDI8	0.98	1.07	0.99	1.08	1.00	1.08	1.00	1.10	0.99	1.08	1.00	1.09
BDI9	0.35	0.72	0.34	0.71	0.35	0.72	0.35	0.72	0.36	0.73	0.34	0.72
BDI10	0.87	1.21	0.86	1.21	0.86	1.21	0.86	1.21	0.86	1.21	0.86	1.21

	Original dataset		Complete data after multiple imputations									
			Iteration 1		Iteration 2		Iteration 3		Iteration 4		Iteration 5	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
BDI11	0.87	1.06	0.87	1.05	0.87	1.06	0.88	1.06	0.87	1.06	0.87	1.05
BDI12	0.65	0.85	0.65	0.85	0.64	0.85	0.65	0.85	0.65	0.85	0.65	0.85
BDI13	0.78	1.03	0.78	1.03	0.77	1.03	0.78	1.04	0.78	1.03	0.78	1.03
BDI14	0.57	0.88	0.57	0.88	0.57	0.88	0.57	0.88	0.57	0.88	0.57	0.88
BDI15	0.86	0.92	0.86	0.92	0.86	0.92	0.86	0.92	0.86	0.92	0.86	0.92
BDI16	0.84	0.99	0.84	0.99	0.84	0.99	0.84	0.99	0.84	0.99	0.84	0.99
BDI17	0.73	0.83	0.73	0.83	0.73	0.83	0.73	0.83	0.73	0.83	0.73	0.83
BDI18	0.71	0.87	0.71	0.88	0.71	0.87	0.71	0.87	0.71	0.87	0.71	0.87
BDI19	0.72	1.01	0.72	1.01	0.72	1.01	0.72	1.01	0.72	1.02	0.72	1.01
BDI20	0.85	1.00	0.85	1.00	0.84	1.00	0.84	1.00	0.85	1.00	0.84	1.00
BDI21	0.79	0.99	0.79	0.99	0.79	0.99	0.79	0.99	0.79	0.99	0.79	0.99

Sample characteristics

As shown in Table 5, female participants represented 51.6% of the sample, while the male participants represented 48.4% of the sample. The ages of the participants ranged from 18 to 71. The mean age of the participants was 36 years.

The majority of the participants (72.6%, 95%CI [68.69, 76.51]) identified themselves as mixed race (Coloured), 26.2% (95%CI [22.35, 30.05]) as African and 0.8% (95%CI [0.02, 1.58]) as White. With regard to first language, 69.0% (95%CI [64.95, 73.05]) of the participants were Afrikaans speaking, followed by 6.0% (95%CI [3.92, 8.08]) English and 19.6% (95%CI [16.12, 23.08]) Xhosa-speaking individuals. Only those persons who were able to understand and respond in English were enrolled in the study. While 46.6% (95%CI [42.23, 50.97]) of the sample are unemployed, 41.0% (95%CI [36.69, 45.31]) had a family income of R10 001- R40 000 per annum.

Table 5
Socio-demographic characteristics of the sample

	Number of respondents (N = 500)	Percentage	95% CI
Gender			
Male	242	48.4	[44.02, 52.78]
Female	258	51.6	[47.22, 55.98]
Age (years)			
Mean	36		
18 – 19	27	5.4	[3.42, 7.38]
20 – 29	150	30.0	[25.98, 34.02]

	Number of respondents (N = 500)	Percentage	95% CI
30 – 39	139	27.9	[23.97, 31.83]
40 – 49	102	20.5	[16.96, 24.04]
50 – 71	80	15.9	[12.69, 19.11]
Race			
African	131	26.2	[22.35, 30.05]
Mixed race (Coloured)	363	72.6	[68.69, 76.51]
White	4	0.8	[0.02, 1.58]
Other	2	0.4	[-0.15, 0.95]
First Language			
Afrikaans	345	69.0	[64.95, 73.05]
English	30	6.0	[3.92, 8.08]
Xhosa	98	19.6	[16.12, 23.08]
Other	27	5.4	[3.42, 7.38]
Current work situation			
Employed full-time	97	19.4	[15.93, 22.87]
Employed part-time	106	21.2	[17.62, 24.78]

	Number of respondents (N = 500)	Percentage	95% CI
Unemployed	233	46.6	[42.23, 50.97]
Homemaker	11	2.2	[0.91, 3.49]
Student	29	5.8	[3.75, 7.85]
Disabled	7	1.4	[0.37, 2.43]
Retired	17	3.4	[1.81, 4.99]
Annual family income			
Less than *ZAR 10 000	203	40.6	[36.3, 44.9]
ZAR 10 001 – ZAR 40 000	205	41.0	[36.69, 45.31]
ZAR 40 001 – ZAR 80 000	57	11.4	[8.61, 14.19]
ZAR 80 001 – ZAR 110 000	20	4.0	[2.28, 5.72]
ZAR 110 001 – ZAR 170 000	8	1.6	[0.5, 2.7]
ZAR 170 001 – ZAR 240 000	4	0.8	[0.02, 1.58]
ZAR 240 000 and above	3	0.6	[-0.08, 1.28]

The prevalence of common mental disorders among people seeking HIV testing

As can be seen in Table 6, the prevalence of major depressive disorder among this sample of people seeking HIV testing was 14.40% (95% CI [11.32, 17.48]); the prevalence of past major

depressive disorder was 18.20% (95% CI [14.82, 21.58]); the prevalence of persistent depressive

disorder was 7.20% (95% CI [4.93, 9.47]); the prevalence of generalized anxiety disorder was

3.40% (95% CI [1.81, 4.99]); the prevalence of alcohol use disorder was 19.60% (95% CI [16.12,

23.08]); and the prevalence of recurrent alcohol use disorder was 35.40% (95% CI [31.21, 39.59]).

Table 6
Prevalence of mood disorders, generalized anxiety, and alcohol use disorder

	Total population	%	95% CI
Current MDD	72	14.40	[11.32, 17.48]
Past MDD	91	18.20	[14.82, 21.58]
MIDD	4	0.80	[0.02, 1.58]
PDD	36	7.20	[4.93, 9.47]
GAD	17	3.40	[1.81, 4.99]
Current AUD	98	19.60	[16.12, 23.08]
Recurrent AUD	177	35.40	[31.21, 39.59]
One disorder	142	28.40	[24.45, 32.35]
Two disorders	84	16.80	[13.52, 20.08]
Three disorders	39	7.80	[5.45, 10.15]

Gender, unemployment and language comparisons with common mental disorders

The chi-square analysis showed that there was no significant relationship between gender and

current major depressive [$\chi 2(1) = 0.96$, p $= 0.33$], past major depressive [$\chi 2(1) = 0.50$, p $= 0.48$],

persistent depressive [$\chi 2(1) = 0.24$, p $= 0.62$], medication induced depressive [$\chi 2(1) = 1.14$, p $= 0.29$],

generalized anxiety [$\chi 2(1) = 24.0$, p $= 0.46$], current alcohol use disorders [$\chi 2(1) = 1.6$, p $= 0.21$], or

past alcohol use disorders [$\chi 2(1) = 69.4$, p $= 0.19$].

As can be seen in Table 8, there were no significant differences between employment and unemployment and the CMD prevalence estimates such as current MDD [χ2(1) =0.76, p =0.38], GAD [χ2(1) =0.01, p =0.91], current AUD [χ2(1) =2.46, p =0.12], and past AUD [χ2(1) =1.05, p =0.31]. However, significant differences were found between employment and unemployment and past MDD [χ2(1) =4.33, p =0.04], PDD [χ2(1) =6.41, p =0.01], and MIDD [χ2(1) =9.76, p =0.01].

In Table 9, the chi-square analysis further showed that there was no significant association between Afrikaans and English and the CMD prevalence estimates such as current MDD [χ2(1) =0.83, p =0.36], past MDD [χ2(1) =0.10, p =0.75], PDD [χ2(1) =1.26, p =0.26], GAD [χ2(1) =0.01, p =0.92], and past AUD [χ2(1) =13.06, p = 0.67]. Conversely, there was significant differences between Afrikaans and English and MIDD [χ2(1) =5.98, p =0.05], and current AUD [χ2(1) =6.17, p =0.01].

Table 7
Comparison of the prevalence of major depressive, generalized anxiety, posttraumatic stress and alcohol use disorder between males and females

	Male	**Female**	χ**2**	***p value**
Current MDD	43.1	56.9	0.96	0.33
Past MDD	45.1	54.9	0.50	0.48
PDD	44.4	55.6	0.24	0.62
MIDD	75.0	25.0	1.14	0.29
GAD	35.3	64.7	24.0	0.46
Current AUD	54.1	45.9	1.6	0.21
Recurrent AUD	59.9	40.1	69.4	0.19

*p < 0.05

Table 8
Comparison of the prevalence of major depressive, generalized anxiety, posttraumatic stress and alcohol use disorder and unemployment

	Employed	**Unemployed**	χ**2**	***p value**
Current MDD	24.6	75.4	0.76	0.38
Past MDD	18.8	81.3	4.33	0.04
PDD	9.7	90.3	6.41	0.01
MIDD	13.7	86.3	9.76	0.01
GAD	27.3	72.7	0.01	0.91
Current AUD	21.7	78.3	2.46	0.12
Recurrent AUD	23.3	76.7	1.05	0.31

*p < 0.05

Table 9
Comparison of the prevalence of major depressive, generalized anxiety, posttraumatic stress and alcohol use disorder and language

	Afrikaans	**English**	χ**2**	***p value**
Current MDD	88.9	11.1	0.83	0.36
Past MDD	91.0	9.0	0.10	0.75
PDD	86.7	13.3	1.26	0.26
MIDD	89.1	10.9	5.98	0.05
GAD	92.9	7.1	0.01	0.92
Current AUD	98.7	1.3	6.17	0.01
Recurrent AUD	92.9	7.1	13.06	0.67

*p < 0.05

Symptoms of distress, depression and anxiety

This section report on the symptoms of distress, depression, anxiety, and alcohol use among people seeking HIV testing.

Symptoms of distress. A Cronbach alpha reliability coefficient revealed that the HSCL-25 had excellent internal consistency ($\alpha = 0.95$). In Table 10, the mean score of the HSCL-25 was 44.27. The suggested cut-off point for the use of the HSCL in clinical settings was a score equal to or greater than 44 (≥ 44). On the HSCL-25, 41.20% (95%CI [36.89, 45.51]) of the sample fell within the clinically significant range.

Symptoms of depression. The internal consistency for the BDI as assessed by Cronbach's alpha was excellent (0.92). In Table 10, the mean score of 16.20 on the BDI fell in the mild to moderate depression range. As can be seen in Table 12, 21.00% (95%CI [17.43, 24.57]) of the participants fell in the mild to moderate range, 21.40% (95% CI [17.81, 24.99]) of the sample fell in the moderate to severe range and 18.00% (95% CI [14.63, 21.37]) of the participants fell in the severe range of depression on the BDI. These findings indicate that a large proportion of the sample reported experiencing elevated symptoms of depression.

Symptoms of anxiety. The internal consistency for the BAI was excellent (0.94). The mean score of 12.58 of the BAI fell in the range of minimal anxiety. Table 13 shows that 78.20% (95%C I [74.58, 81.82]) of the sample reported minimal anxiety, 13.60% (95% CI [10.6, 16.6]) reported moderate anxiety and only 8.20% (95%CI [5.8, 10.6]) reported severe anxiety. The majority of the sample reported mild anxiety.

Symptoms of alcohol use disorders. The internal consistency of the AUDIT was excellent (0.89). As can be seen in Table 10, the mean score was 6.61 for the AUDIT. The recommended cut-off point of 8 for clinical use indicates harmful alcohol use and likely alcohol dependence. In Table 14, using the cut-off point of 8, 65.40% (95% CI [61.23, 69.57]) of the sample scored below the cut-off

point on the AUDIT, whereas 34.60% (95% CI [30.43, 28.77]) of the sample fell within the

clinically significant range.

Table 10
Mean scores on the HSCL, BDI, BAI and AUDIT

Instrument	N	Mean	SD
HSCL Anxiety	500	17.41	6.39
HSCL Depression	500	26.87	10.66
HSCL Total	500	44.27	16.40
BDI	467	16.20	12.67
BAI	500	12.58	13.11
AUDIT	500	6.61	8.15

Table 11
Percentage of sample scoring above clinical cut-off point of 44 on the HSCL

	N	%	95% ci
< 44	294	58.80	[54.49, 63.11]
≥ 44	206	41.20	[36.89, 45.51]

Table 12
Percentage of sample in each BDI category

	N	%	95% CI
Normal (0-9)	198	39.60	[35.31, 43.89]
Mild to moderate (10-18)	105	21.00	[17.43, 24.57]
Moderate to severe (19-29)	107	21.40	[17.81, 24.99]
Severe (30-50.5)	90	18.00	[14.63, 21.37]

Table 13
Percentage of sample in each BAI category

	N	%	95% CI
Mild anxiety (0-21)	391	78.20	[74.58, 81.82]
Moderate anxiety (22-35)	68	13.60	[10.6, 16.6]
Severe anxiety (36-63)	41	8.20	[5.8, 10.6]

Table 14
Percentage of sample scoring above clinical cut-off point of 8 on the AUDIT

	N	%	
< 8	327	65.40	[61.23, 69.57]
≥ 8	173	34.60	[30.43, 28.77]

Screening for Mood Disorders

This section reports on the performance of the HSCL-25, HSCL-25 depression subscale and BDI as screening tools for the accurate detection of current and persistent depressive disorders.

Receiver operating characteristic curve (ROC) analysis for the HSCL-25 in screening for current MDD. The ROC curve in Figure 7 shows the performance of the total HSCL-25 in identifying current major depressive disorder (MDD). The area under the curve (AUC) calculates the ability of the HSCL-25 to discriminate between those individuals with MDD and those individuals without MDD. Swets (1988) suggests that AUC scores greater than 0.9 indicates "high" accuracy, while 0.7–0.9 indicates "moderate" accuracy, 0.5–0.7 "low accuracy", and 0.5 a chance result (Fisher et al., 2003; Swets, 1988). The AUC of 85% (AUC = 0.85, 95% CI = 0.802, 0.890) shows that the HSCL is moderately accurate in discriminating between MDD caseness and non-caseness.
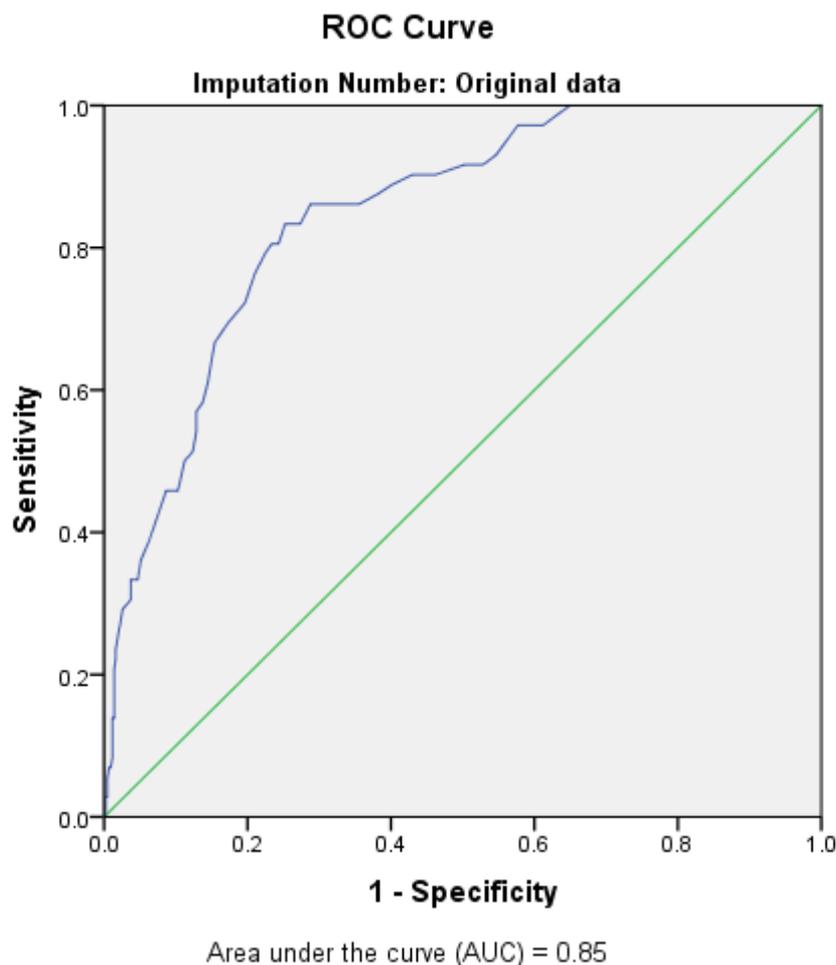
Figure 7   Receiver operating characteristic (ROC) curve for the diagnosis of current MDD among the 500 people seeking HIV testing based on the total HSCL-25

Accuracy of the HSCL-25 cut-off point. In order to increase both sensitivity and specificity, the Younden's index was applied: Youden Index = Sensitivity+ Specificity -1 (Hajian-Tilaki, 2013). The Youden index J refers to the position on the ROC curve (Fig. 8) further from the diagonal line, also called the line of equality (Fig. 8). The value of the ROC-curve statistic selected as an optimal cut-off is where the term "Sensitivity + Specificity - 1" is maximal. Thus, the Youden index is an accepted measurement for the receiver operating characteristic curve to calculate the clinical diagnostic ability of a test (Youden, 1950).
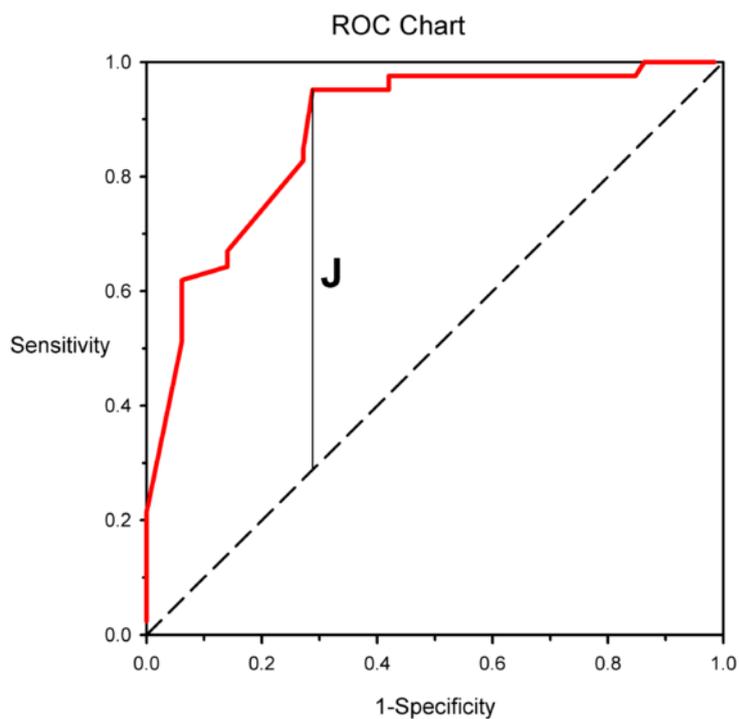
Figure 8   Youdin's J statistic (Youdin, 1950; Schisterman, Perkins, Liu, & Bondell, 2005; Powers, 2011)

An examination of the sensitivity (true positives) and specificity (true negatives) values in Table 15 shows that a HSCL-25 cut-off point of 51.5 yielded optimal sensitivity (0.79) and specificity (0.78).

Table 15
ROC curve coordinates of the HSCL-25

Cut-off point	Sensitivity	1-Sensitivity	Specificity
23.0000	1.000	1.000	0.000
24.5000	1.000	0.956	0.044
25.5000	1.000	0.923	0.077
26.5000	1.000	0.890	0.110
27.5000	1.000	0.855	0.145
28.5000	1.000	0.825	0.175
29.5000	1.000	0.771	0.229
30.5000	1.000	0.720	0.280
31.5000	1.000	0.687	0.313
32.5000	1.000	0.650	0.350
33.5000	0.972	0.612	0.388
34.5000	0.972	0.577	0.423
35.5000	0.931	0.547	0.453
36.5000	0.917	0.528	0.472
37.5000	0.917	0.502	0.498
38.5000	0.903	0.463	0.537
39.5000	0.903	0.430	0.570
40.5000	0.889	0.402	0.598
41.5000	0.875	0.381	0.619
42.5000	0.861	0.355	0.645
43.5000	0.861	0.336	0.664
44.5000	0.861	0.325	0.675
45.5000	0.861	0.313	0.687

Cut-off point	Sensitivity	1-Sensitivity	Specificity
46.5000	0.861	0.287	0.713
47.5000	0.833	0.273	0.727
48.5000	0.833	0.252	0.748
49.5000	0.806	0.243	0.757
50.5000	0.806	0.234	0.766
51.5000	0.792	0.224	0.776
52.5000	0.764	0.210	0.790
53.5000	0.722	0.196	0.804
54.5000	0.694	0.173	0.827
55.5000	0.681	0.164	0.836
56.5000	0.667	0.154	0.846
57.5000	0.611	0.145	0.855
58.5000	0.583	0.138	0.862
59.5000	0.569	0.129	0.871
60.5000	0.542	0.129	0.871
50.5000	0.806	0.234	0.766
61.5000	0.514	0.124	0.876
62.5000	0.500	0.112	0.888
63.5000	0.458	0.103	0.897
64.5000	0.458	0.098	0.902
65.5000	0.458	0.086	0.914
67.5000	0.417	0.072	0.928
68.5000	0.389	0.063	0.937
69.5000	0.361	0.051	0.949

Cut-off point	Sensitivity	1-Sensitivity	Specificity
70.5000	0.347	0.049	0.951
71.5000	0.333	0.047	0.953
72.5000	0.333	0.037	0.963
73.5000	0.306	0.037	0.963
74.5000	0.292	0.026	0.974
75.5000	0.250	0.019	0.981
76.5000	0.236	0.016	0.984
77.5000	0.222	0.016	0.984
78.5000	0.208	0.014	0.986
79.5000	0.139	0.014	0.986
81.0000	0.139	0.012	0.988
82.5000	0.083	0.012	0.988
83.5000	0.069	0.009	0.991
84.5000	0.069	0.007	0.993
86.0000	0.056	0.005	0.995
87.5000	0.042	0.005	0.995
89.0000	0.028	0.005	0.995
90.5000	0.028	0.002	0.998
91.5000	0.014	0.002	0.998
92.5000	0.000	0.002	0.998
94.0000	0.000	0.000	1.000
67.5000	0.417	0.072	0.928
68.5000	0.389	0.063	0.937
69.5000	0.361	0.051	0.949

Cut-off point	Sensitivity	1-Sensitivity	Specificity
70.5000	0.347	0.049	0.951
71.5000	0.333	0.047	0.953
72.5000	0.333	0.037	0.963
73.5000	0.306	0.037	0.963
74.5000	0.292	0.026	0.974
75.5000	0.250	0.019	0.981
76.5000	0.236	0.016	0.984
77.5000	0.222	0.016	0.984
78.5000	0.208	0.014	0.986
79.5000	0.139	0.014	0.986
81.0000	0.139	0.012	0.988
82.5000	0.083	0.012	0.988
83.5000	0.069	0.009	0.991
84.5000	0.069	0.007	0.993
86.0000	0.056	0.005	0.995
87.5000	0.042	0.005	0.995
89.0000	0.028	0.005	0.995
90.5000	0.028	0.002	0.998
91.5000	0.014	0.002	0.998
92.5000	0.000	0.002	0.998
94.0000	0.000	0.000	1.000

Sensitivity, specificity, and predictive values of the HSCL-25 with reference to the optimal cut-off point of 51.5. For this study, 72 (14.40%) participants of the total sample scored above the optimal cut-off point of 51.5 on the HSCL-25. Furthermore, of these 72 participants, 57 (79.17%) also met the diagnostic criteria for major depression using the SCID, in other words they were true positives. However, of the 72 participants, 15 (20.83%) participants scored below the optimal cut-off point (51.5) on the HSCL-25, but met the diagnostic criteria for major depression on the SCID, in other words they were false negatives.

Furthermore, 428 (85.60%) participants of the total sample scored below the optimal cut-off point of 51.5 on the HSCL-25. Of these 428 participants, 334 (78.04%) participants did not meet the diagnostic criteria for MDD on the SCID, in other words they were true negatives. Conversely, of the 428 participants, 94 (21.96%) participants scored above the optimal cut-off point of 51.5 on the HSCL-25, but did not meet the diagnostic criteria for major depression on the SCID, so they were false positives.

In Table 17, the optimal cut-off score of 51.5 yielded a positive predictive value (PPV) of 38.31%, indicating that only 38.31% of those who scored above the optimal cut-off point on the HSCL-25 are confirmed true cases with the SCID as gold standard. Conversely, the optimal cut-off point of 51.5 yielded a negative predictive value (NPV) of 96.70%, indicating that 96.70% of those who scored below the optimal cut-off point of 51.5 on the HSCL-25 were confirmed true non-cases.

Table 16

Two-by-two table of HSCL-25 vs SCID major depression diagnosis

	Positive (SCID)	N	Negative (SCID)	n	Total
HSCL ≥ 51.5	57 (true positive)	a	94 (false positive)	c	a+c = 151
HSCL < 51.5	15 (false negative)	b	334 (true negative)	d	b+d = 349
Total		a+b = 72		c+d = 428	

Table 17

Sensitivity, specificity and predictive values of the HSCL-25 with reference to the optimal cut-off point of 51.5

	Formula		n	%	95% CI
Sensitivity	= a / (a+b)	57/72	0.79	79.17%	[75.61, 82.73]
Specificity	= d / (c+d)	334/428	0.78	78.04%	[93.92, 97.48]
Positive predictive value (PPV)	= a / (a+c)	57/151	0.38	38.31%	[34.05, 42.57]
Negative predictive value (NPV)	= d / (b+d)	334/349	0.96	96.70%	[95.13, 8.27]

Receiver operating characteristic curve (ROC) analysis for the HSCL-25 depression subscale in screening for current MDD. The ROC curve in Figure 9 displays the performance of the HSCL-25 depression subscale with the highest sum of sensitivity and specificity against the SCID. The AUC of 86% (AUC = 0.86, 95% CI = (0.816-0.898)) indicates that the HSCL-25

depression subscale is a useful screening tool to discriminate between major depression caseness and non-caseness.

ROC Curve
Imputation Number: Original data

Area under the curve (AUC) = 0.86
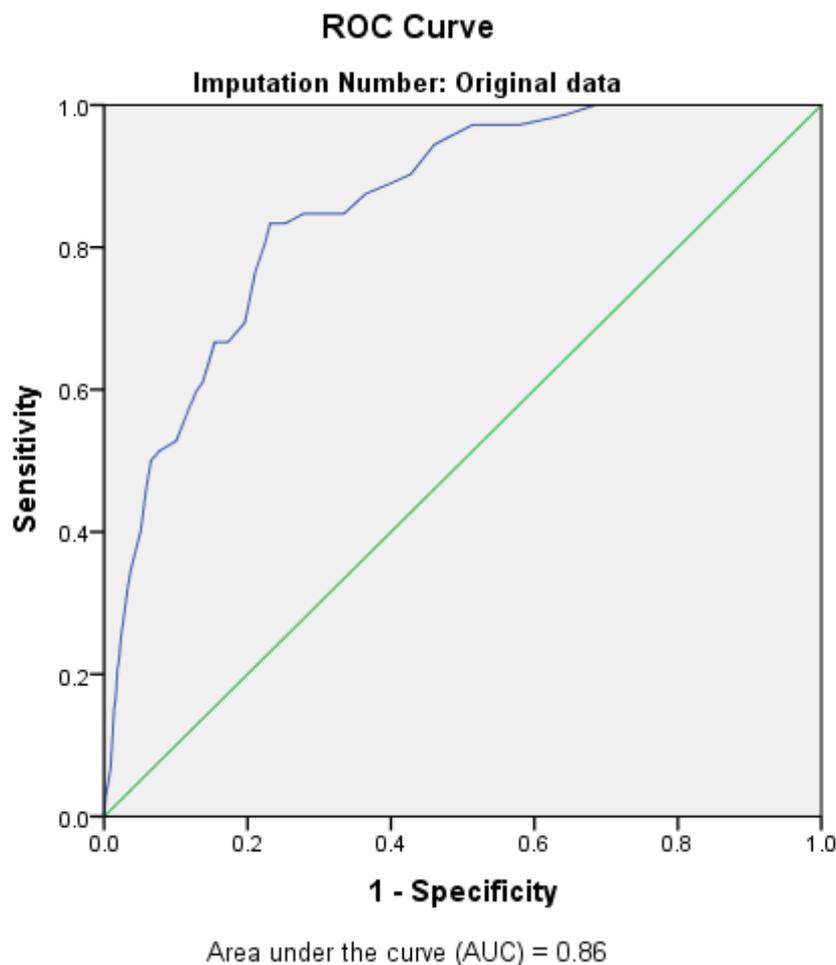
Figure 9   Receiver operating characteristic (ROC) curve for the diagnosis of current MDD among the 500 people seeking HIV testing based on HSCL-25 depression subscale

Accuracy of the cut-off points of the HSCL-25 depression subscale. The Youden index maximizes the difference between sensitivity and specificity. As can be seen in Table 18, the highlighted HSCL-25 depression subscale optimal cut-off point of 32.5 yielded optimal sensitivity (0.76) and specificity (0.79).

Table 18

ROC curve coordinates of the HSCL-25 depression subscale using the SCID as the gold standard

Cut-off point	Sensitivity	1-Specificity	Specificity
13.0000	1.000	1.000	0.000
14.5000	1.000	0.930	0.070
15.5000	1.000	0.871	0.129
16.5000	1.000	0.827	0.173
17.5000	1.000	0.759	0.241
18.5000	1.000	0.685	0.315
19.5000	0.986	0.643	0.357
20.5000	0.972	0.579	0.421
21.5000	0.972	0.514	0.486
22.5000	0.944	0.460	0.540
23.5000	0.903	0.428	0.572
24.5000	0.889	0.397	0.603
25.5000	0.875	0.364	0.636
26.5000	0.847	0.334	0.666
27.5000	0.847	0.320	0.680
28.5000	0.847	0.278	0.722
29.5000	0.833	0.252	0.748
30.5000	0.833	0.231	0.769
31.5000	0.806	0.224	0.776
32.5000	0.764	0.210	0.790
33.5000	0.694	0.196	0.804
34.5000	0.667	0.173	0.827
35.5000	0.667	0.154	0.846

Cut-off point	Sensitivity	1-Specificity	Specificity
36.5000	0.611	.138	0.862
37.5000	0.597	0.129	0.871
38.5000	0.569	0.117	0.883
39.5000	0.528	0.100	0.900
40.5000	0.514	0.077	0.923
41.5000	0.500	0.065	0.935
42.5000	0.458	0.058	0.942
43.5000	0.403	0.051	0.949
44.5000	0.347	0.037	0.963
45.5000	0.319	0.033	0.967
46.5000	0.250	0.023	0.977
47.5000	0.222	0.021	0.979
48.5000	0.208	0.019	0.981
49.5000	0.167	0.016	0.984
50.5000	0.153	0.014	0.986
51.5000	0.069	0.009	0.991
52.5000	0.056	0.007	0.993
53.5000	0.042	0.005	0.995
55.0000	0.028	0.002	0.998
57.0000	0.000	0.000	1.000

Sensitivity, specificity, and predictive values of the HSCL depression subscale with reference to the optimal cut-off point of 32.5. As can be seen in Table 19, 72 (14.40%) participants of the total sample scored above the optimal cut-off point of 32.5 on the HSCL-25 depression subscale. Of these 72 participants, 55 (76.39%) participants also met the diagnostic criteria for major depression using the SCID, in other words they were true positives. Of the 72 participants, 17 (23.61%) participants scored below the optimal cut-off point on the HSCL-25 depression subscale, but met the diagnostic criteria for major depression on the SCID, so they were false negatives.

However, 428 (85.60%) participants of the total sample scored below the optimal cut-off point of 32.5. Of these 428 participants, 338 (79.00%) did not meet the diagnostic criteria for MDD on the SCID, in other words they were true negatives. Also, of the 428 participants, 90 (21.03%) participants who scored above the optimal cut-off point (32.5) on the HSCL-25 depression subscale did not meet the diagnostic criteria for depression on the SCID, so they were false positives.

In Table 20, the positive predictive value was 38.00%, indicating that 38.00% of those participants who scored above the optimal cut-off point of 32.5 on the HSCL-25 depression subscale, were correctly identified as cases for major depression. The negative predictive value was 95.21%, indicating that 95.21% of the participants who scored below the optimal cut-off point of 32.5 were correctly identified as non-cases for major depression.

Table 19
Two-by-two table of HSCL-25 vs SCID major depression diagnosis

	Positive (SCID)	n	Negative (SCID)	n	Total
HSCL ≥ 32.5	55 (true positive)	a	90 (false positive)	c	a+c = 145
HSCL < 32.5	17 (false negative)	b	338 (true negative)	d	b+d = 355
Total		a+b = 72		c+d = 428	

Table 20
Sensitivity, specificity and predictive values of the HSCL-25 depression subscale with reference to the optimal cut-off point of 32.5

	Formula	n		%	95% CI
Sensitivity	= a / (a+b)	55/72	0.76	76.39%	[72.67, 80.11]
Specificity	= d / (c+d)	338/428	0.79	79.00%	[75.43, 82.57]
Positive predictive value (PPV)	= a / (a+c)	55/145	0.38	38.00%	[33.75, 42.25]
Negative predictive value (NPV)	= d / (b+d)	338/355	0.95	95.21%	[93.34, 97.08]

Receiver operating characteristic curve (ROC) analysis in determining current MDD based on the BDI. The ROC curve in Figure 10 shows the performance of the BDI in accurately determining the optimal balance of sensitivity and specificity against the SCID as the gold standard. The AUC of 0.77 (77%) (AUC = 0.76, 95% CI = 0.71-0.82) indicates that the BDI is a useful screening tool in detecting caseness and non-caseness for major depression.
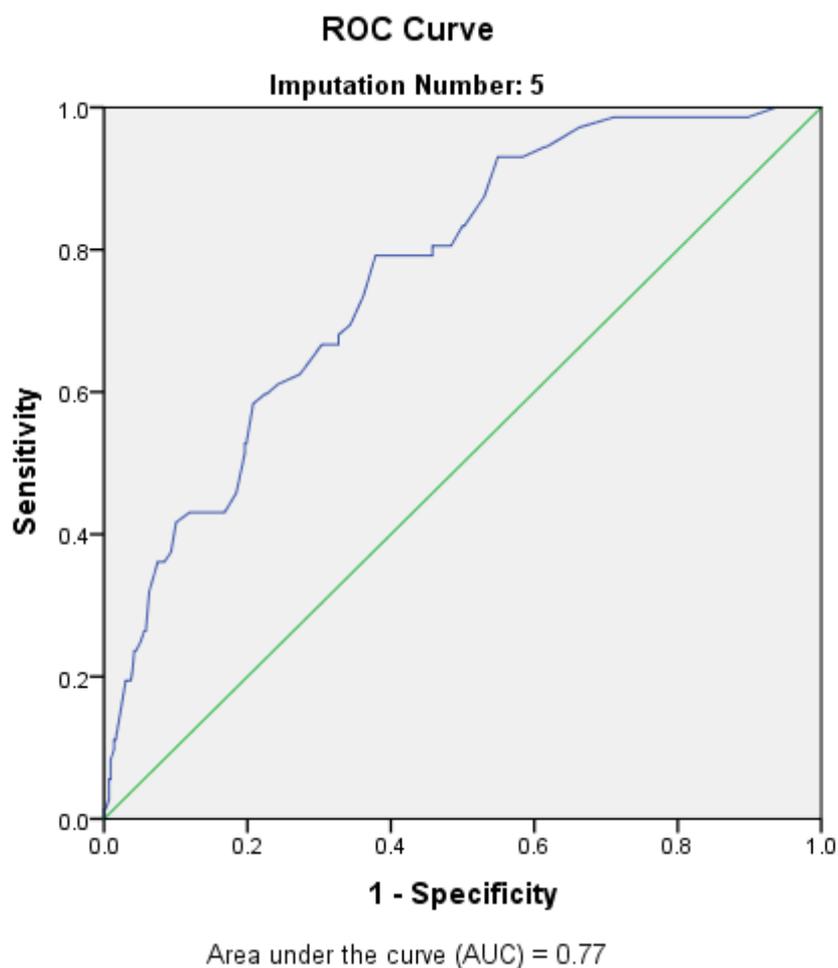
Figure 10 Receiver operating characteristic (ROC) curve for the diagnosis of current major depressive disorder among the 500 people seeking HIV testing

Accuracy of the BDI cut-off points. The Younden's index can be applied to maximize both sensitivity and specificity. As can be seen in Table 21, an assessment of the sensitivity and

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specificity values shows that a BDI cut-off point of 19.5 yielded optimal sensitivity (0.67) and

specificity (0.67).

Table 21
ROC curve coordinates of the BDI using the SCID as the gold standard

Cut-off point	Sensitivity	1-Specificity	Specificity
-1.0000	1.000	1.000	0.000
.5000	1.000	0.937	0.063
1.0425	0.986	0.897	0.103
1.1942	0.986	0.895	0.105
1.6517	0.986	0.893	0.107
2.2138	0.986	0.853	0.147
2.5011	0.986	0.850	0.150
2.7872	0.986	0.848	0.152
3.4326	0.986	0.783	0.217
3.8925	0.986	0.780	0.220
3.9599	0.986	0.778	0.222
4.0247	0.986	0.729	0.271
4.5247	0.986	0.727	0.273
5.5000	0.986	0.710	0.290
6.5000	0.972	0.664	0.336
7.1165	0.944	0.617	0.383
7.6165	0.944	0.614	0.386
8.5000	0.931	0.584	0.416
9.5000	0.931	0.549	0.451
10.5000	0.875	0.530	0.470
11.0743	0.833	0.502	0.498

Cut-off point	Sensitivity	1-Specificity	Specificity
11.5743	0.833	0.500	0.500
12.1583	0.806	0.484	0.516
12.6583	0.806	0.481	0.519
13.0603	0.806	0.458	0.542
13.5603	0.792	0.458	0.542
14.2371	0.792	0.425	0.575
14.7075	0.792	0.423	0.577
14.9703	0.792	0.421	0.579
15.2358	0.792	0.400	0.600
15.5193	0.792	0.397	0.603
15.7835	0.792	0.395	0.605
16.0867	0.792	0.383	0.617
16.5203	0.792	0.381	0.619
16.9336	0.792	0.379	0.621
17.5000	0.736	0.362	0.638
18.5000	0.694	0.343	0.657
19.0208	0.681	0.327	0.673
19.5208	0.667	0.327	0.673
20.5000	0.667	0.304	0.696
21.5000	0.625	0.273	0.727
22.5000	0.611	0.243	0.757
23.3289	0.597	0.227	0.773
23.8289	0.597	0.224	0.776
24.5000	0.583	0.208	0.792

Cut-off point	Sensitivity	1-Specificity	Specificity
25.0322	0.528	0.199	0.801
25.3678	0.528	0.196	0.804
25.8356	0.514	0.196	0.804
26.5000	0.458	0.185	0.815
27.5000	0.431	0.168	0.832
28.5000	0.431	0.161	0.839
29.1294	0.431	0.143	0.857
29.6294	0.431	0.140	0.860
30.3760	0.431	0.121	0.879
30.8760	0.431	0.119	0.881
31.5000	0.417	0.100	0.900
32.5000	0.375	0.093	0.907
33.0320	0.361	0.084	0.916
33.1915	0.361	0.082	0.918
33.3776	0.361	0.079	0.921
33.5839	0.361	0.077	0.923
33.8658	0.361	0.075	0.925
34.5000	0.319	0.063	0.937
35.1305	0.264	0.058	0.942
35.6305	0.264	0.056	0.944
36.5000	0.250	0.051	0.949
37.0305	0.236	0.044	0.956
37.5305	0.236	0.042	0.958
38.5000	0.208	0.040	0.960

Cut-off point	Sensitivity	1-Specificity	Specificity
39.5000	0.194	0.037	0.963
40.5000	0.194	0.030	0.970
41.5000	0.167	0.026	0.974
42.1032	0.111	0.016	0.984
42.5828	0.111	0.014	0.986
42.9796	0.097	0.014	0.986
43.5000	0.083	0.009	0.991
45.0000	0.056	0.009	0.991
47.5000	0.042	0.007	0.993
49.0000	0.028	0.007	0.993
50.2471	0.014	0.002	0.998
50.4992	0.014	0.000	1.000
51.5041	0.000	0.000	1.000

Sensitivity, specificity, and predictive values of the BDI with reference to the optimal cut-off point of 19.5. In Table 22, 72 (14.40%) participants of the total sample scored above the optimal cut-off point of 19.5 on the BDI. Of this number, 48 (67.00%) participants also met the diagnostic criteria for major depression using the SCID, in other words they were true positive cases. On the other hand, of the 72 participants, 24 (33.33%) participants scored below the optimal cut-off point on the BDI, but met the diagnostic criteria for major depression on the SCID, so they were false negatives.

Furthermore, 428 (85.60%) participants of the total sample scored below the optimal cut-off point on the BDI. Of these 428 participants, 287 (67.05%) participants also did not meet the diagnostic criteria for MDD using the SCID, in other words they were true negatives. Of the 428

participants, 141 (32.95%) participants scored above the optimal cut-off point on the BDI, but did not meet the diagnostic criteria for major depression on the SCID, so they were false positives.

As can be seen in Table 23, the optimal cut-off score of 19.5 yielded a positive predictive value (PPV) of 25.39%, indicating that only 25.39% of those who scored above the optimal cut-off point on the BDI were confirmed true cases with the SCID as the gold standard. Conversely, the cut-off point of 19.5 yielded a negative predictive value (NPV) of 92.28%, indicating that 92.28% of those who scored below the optimal cut-off point on the BDI were confirmed true non-cases.

Table 22

Two-by-two table of BDI vs SCID major depression diagnosis

	Positive (SCID)	**n**	**Negative (SCID)**	**N**	**Total**
BDI $\geq$ 19.5	48 (true positive)	a	141 (false positive)	C	a+c = 189
BDI < 19.5	24 (false negative)	b	287 (true negative)	D	b+d = 311
Total		a+b = 72		c+d = 428	

Table 23

Sensitivity, specificity and predictive values of the BDI with reference to the optimal cut-off point of 19.5

	Formula		n	%	95% CI
Sensitivity	= a / (a+b)	48/72	0.67	67.00%	[62.88, 71.12]
Specificity	= d / (c+d)	287/428	0.67	67.05%	[62.93, 71.17]
Positive predictive value (PPV)	= a / (a+c)	48/189	0.25	25.39%	[22.06. 29.74]
Negative predictive value (NPV)	= d / (b+d)	287/311	0.92	92.28%	[89.94, 94.62]

Odds ratio of current MDD with regard to past MDD compared to no past MDD.

In Table 24, 72 participants (14.40%) of the total sample were diagnosed with current major depression. Of these participants, 40 (55.56%) also met the criteria for past MDD and 32 (44.44%) did not. Conversely, 428 (85.6%) of all participants in the sample did not meet the criteria for current MDD. Of these 428 participants, 51 (11.92%) met the criteria for past MDD and 377 (88.08%) did not.

As can be seen in Table 25, the odds ratio for past MDD as a risk factor for current MDD was 9.24 (OR = 9.24; 95% CI = 5.34, 16.00). This means that persons who had current MDD were 9 times more likely to have had past MDD than persons with no current MDD.

Table 24

Two-by-two table of current MDD vs Past MDD

	Current MDD (positive)	N	Current MDD (negative)	N	Total
Past MDD case (positive)	40	a	51	b	a+b = 91
PMD non-case (negative)	32	c	377	d	c+d = 409
Total		a+b = 72		c+d = 428	

Table 25

Odds Ratio of Current MDD vs Past MDD

	Formula		OR	95% CI
Odds ratio	$= \dfrac{a/c}{b/d}$ $= \dfrac{ad}{bc}$	$= \dfrac{40 \; x \; 377}{51 \; x \; 32}$	$= 9.24$	[5.34, 16.00]

a = Number of exposed cases

    = participants with current MDD assessed as having past MDD

b = Number of exposed non-cases

    = participants with no current MDD assessed as having past MDD

c = Number of unexposed cases

    = participants with current MDD not assessed as having past MDD

d = Number of unexposed non-cases

    = participants with no current MDD not assessed as having past MDD

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Receiver operating characteristic curve (ROC) analysis for the HSCL-25 in screening

for persistent depressive disorder (PDD). In Figure 11, the area under the ROC curve (AUC) is a

measurement of the ability of the BDI to discriminate between PDD caseness and non-caseness.

The AUC of 82% (AUC = 0.82, 95% CI = 0.76-0.89) indicates that the BDI is an excellent

screening tool in identifying those with or without PDD.
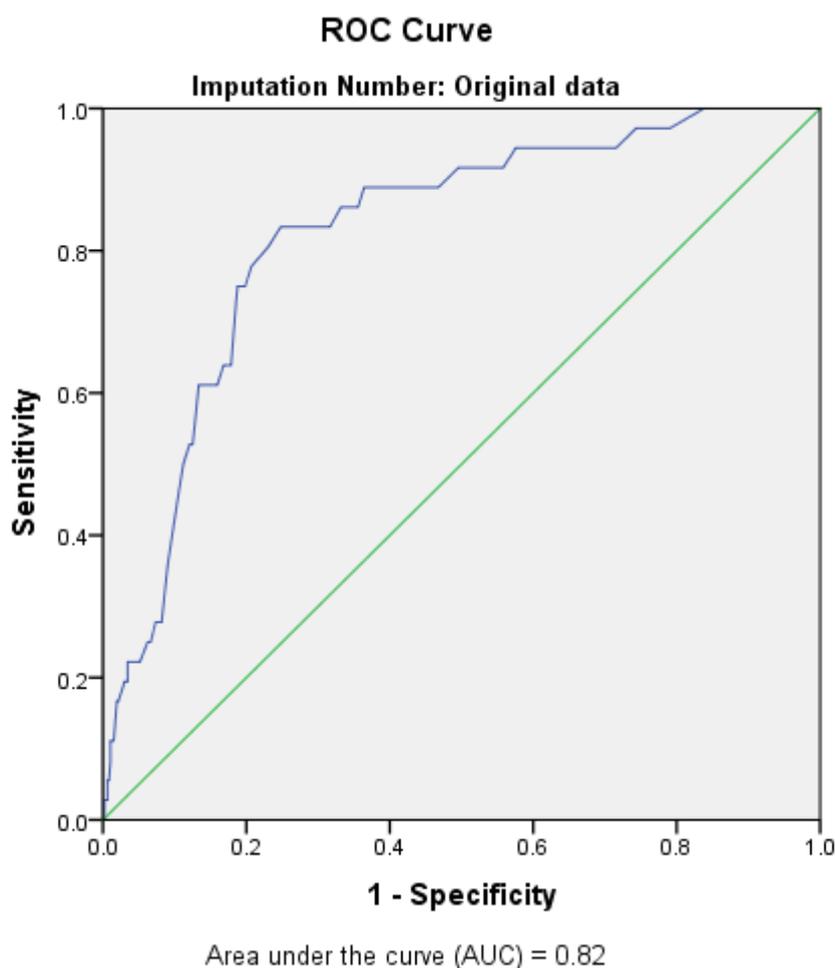
Figure 11   Receiver operating characteristic (ROC) curve for the diagnosis of persistent
depressive disorder (PDD) among the 500 people seeking HIV testing based on the
HSCL-25

Accuracy of the HSCL cut-off points. In Table 26, the highlighted optimal cut-off point of

54.5 yielded optimal sensitivity (0.78) and specificity (0.79). The optimal cut-off point of 54.5

shows that the HSCL-25 correctly identified 78% of individuals with PDD and correctly identified

79% of individuals who did not have PDD.

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Table 26

ROC curve coordinates of the HSCL-25 using the SCID as the gold standard

Cut-off point	Sensitivity	1-Specificity	Specificity
23.0000	1.000	1.000	0.000
24.5000	1.000	0.959	0.041
25.5000	1.000	0.929	0.071
26.5000	1.000	0.899	0.101
27.5000	1.000	0.866	0.134
28.5000	1.000	0.838	0.162
29.5000	0.972	0.791	0.209
30.5000	0.972	0.744	0.256
31.5000	0.944	0.716	0.284
32.5000	0.944	0.681	0.319
33.5000	0.944	0.642	0.358
34.5000	0.944	0.610	0.390
35.5000	0.944	0.575	0.425
36.5000	0.917	0.558	0.442
37.5000	0.917	0.534	0.466
38.5000	0.917	0.496	0.504
39.5000	0.889	0.468	0.532
40.5000	0.889	0.440	0.560
41.5000	0.889	0.418	0.582
42.5000	0.889	0.392	0.608
43.5000	0.889	0.375	0.625
44.5000	0.889	0.364	0.636
45.5000	0.861	0.356	0.644

Cut-off point	Sensitivity	1-Specificity	Specificity
46.5000	0.861	0.332	0.668
47.5000	0.833	0.317	0.683
48.5000	0.833	0.297	0.703
49.5000	0.833	0.284	0.716
50.5000	0.833	0.276	0.724
51.5000	0.833	0.265	0.735
52.5000	0.833	0.248	0.752
53.5000	0.806	0.231	0.769
54.5000	0.778	0.207	0.793
55.5000	0.750	0.198	0.802
56.5000	0.750	0.188	0.813
57.5000	0.639	0.179	0.821
58.5000	0.639	0.168	0.832
59.5000	0.611	0.159	0.841
60.5000	0.611	0.155	0.845
61.5000	0.611	0.147	0.853
62.5000	0.611	0.134	0.866
63.5000	0.528	0.125	0.875
64.5000	0.528	0.121	0.879
65.5000	0.500	0.112	0.888
66.5000	0.444	0.103	0.897
67.5000	0.417	0.099	0.901
68.5000	0.361	0.091	0.909
69.5000	0.278	0.082	0.918

Cut-off point	Sensitivity	1-Specificity	Specificity
70.5000	0.278	0.078	0.922
71.5000	0.278	0.073	0.927
72.5000	0.250	0.067	0.933
73.5000	0.250	0.063	0.938
74.5000	0.222	0.052	0.948
75.5000	0.222	0.039	0.961
76.5000	0.222	0.034	0.966
77.5000	0.194	0.034	0.966
78.5000	0.194	0.030	0.970
79.5000	0.167	0.022	0.978
81.0000	0.167	0.019	0.981
82.5000	0.111	0.015	0.985
83.5000	0.111	0.011	0.989
84.5000	0.083	0.011	0.989
86.0000	0.056	0.009	0.991
87.5000	0.056	0.006	0.994
89.0000	0.028	0.006	0.994
90.5000	0.028	0.004	0.996
91.5000	0.028	0.002	0.998
92.5000	0.000	0.002	0.998
94.0000	0.000	0.000	1.000

Sensitivity, specificity, and predictive values with reference to the cut-off point of 54.5.

Thirty-six (7.20%) participants of the total sample scored above the optimal cut-off point of 54.5 on the HSCL-25. Of this number, 28 (78.00%) participants also met the diagnostic criteria for PDD on the SCID, in other words they were true positives. However, of the 36 participants, 8 (22.22%) participants scored below the optimal cut-off point on the HSCL-25, but met the diagnostic criteria for PDD on the SCID, so they were false negatives.

Furthermore, 464 (92.80%) participants of the total sample scored below the optimal cut-off point of 54.5 on the HSCL-25. Of this number, 367 (79.09%) participants did not meet the diagnostic criteria for PDD on the SCID, in other words they were true negatives. Of these 464 participants, 97 (20.91%) participants scored above the optimal cut-off point on the HSCL-25, but did not meet the diagnostic criteria for PDD on the SCID, so they were false positives.

The PPV was 22.00%, indicating that 22.00% of the participants who scored above the optimal cut-off point of 54.5 on the HSCL-25 were correctly identified cases for PDD. The NPV was 98.00%, indicating that 98.00% of the participants who scored below the optimal cut-off point of 54.5 on the HSCL-25 were correctly identified as non-cases for PDD.

Table 27

Two-by-two table of HSCL-25 vs SCID persistent depressive disorder diagnosis

	Positive (SCID)	n	Negative (SCID)	N	Total
HSCL ≥ 54.5	28 (true positive)	a	97 (false positive)	c	a+c = 125
HSCL < 54.5	8 (false negative)	b	367 (true negative)	d	b+d = 375
Total		a+b = 36		c+d = 464	

Table 28

Sensitivity, specificity and predictive values of the HSCL-25 with reference to the optimal cut-off point of 54.5

	Formula	n	%	95% CI
Sensitivity	= a / (a+b)	28/36	0.78	78.00%	[74.37, 81.63]
Specificity	= d / (c+d)	367/464	0.79	79.09%	[75.51, 82.65]
Positive predictive value (PPV)	= a / (a+c)	28/130	0.22	22.00%	[18.37, 25.63]
Negative predictive value (NPV)	= d / (b+d)	362/370	0.98	98.00%	[96.77, 99.23]

ROC analysis in determining PDD based on the HSCL-25 depression subscale. In Figure 12, the ROC curve shows that the HSCL-25 depression subscale performed excellently as a predictor of PDD, with an AUC of 82% (AUC = 0.82, 95% CI = 0.75-0.88).

ROC Curve

Imputation Number: 4

Area under the curve (AUC) = 0.82
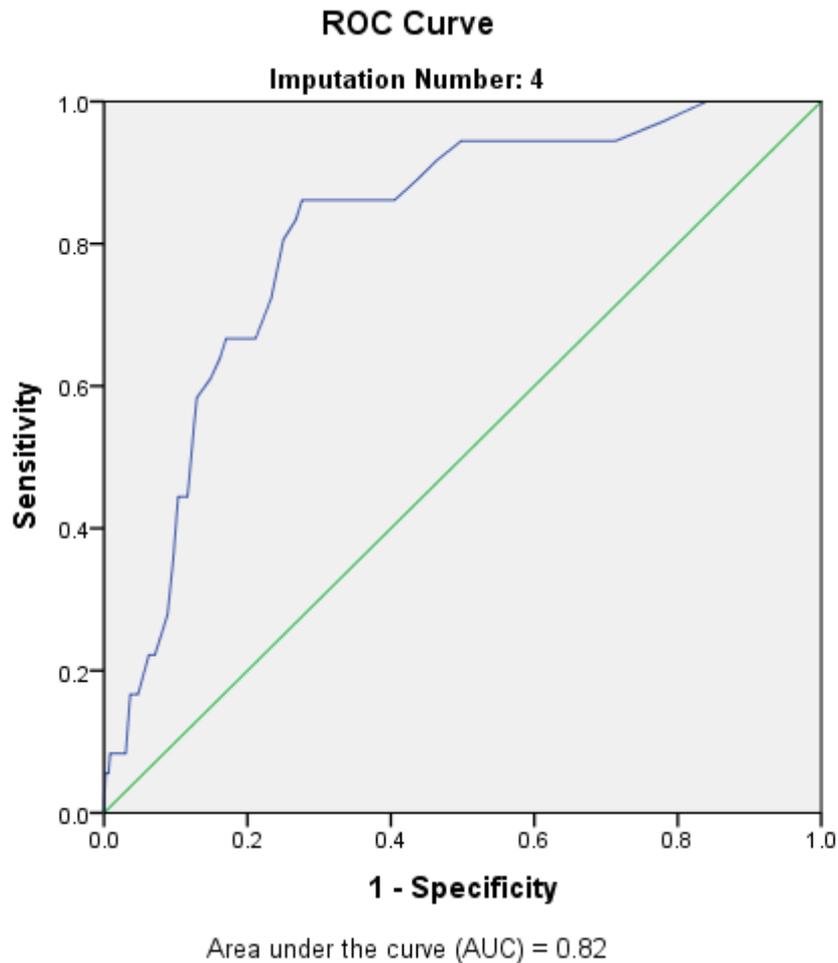
Figure 12   Receiver operating characteristic (ROC) curve for the diagnosis of PDD among the 500 people seeking HIV testing based on the HSCL-25 depression subscale

Accuracy of the HSCL depression cut-off points. Table 29 shows the sensitivity and specificity values for every likely cut-off point on the HSCL-25 depression subscale. The Youdin's J statistic was used to calculate the optimal sensitivity and specificity. The highlighted cut-off point of 33.5 yielded optimal sensitivity (0.72) and specificity (0.77).

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Table 29
ROC curve coordinates of the HSCL-25 depression subscale using the SCID as the gold standard

Cut-off point	Sensitivity	1-Specificity	Specificity
13.0000	1.000	1.000	0.000
14.5000	1.000	0.935	0.065
15.5000	1.000	0.881	0.119
16.5000	1.000	0.841	0.159
17.5000	0.972	0.780	0.220
18.5000	0.944	0.713	0.287
19.5000	0.944	0.672	0.328
20.5000	0.944	0.612	0.388
21.5000	0.944	0.552	0.448
22.5000	0.944	0.498	0.502
23.5000	0.917	0.463	0.537
24.5000	0.889	0.435	0.565
25.5000	0.861	0.405	0.595
26.5000	0.861	0.373	0.627
27.5000	0.861	0.360	0.640
28.5000	0.861	0.321	0.679
29.5000	0.861	0.295	0.705
30.5000	0.861	0.276	0.724
31.5000	0.833	0.267	0.733
32.5000	0.806	0.250	0.750
33.5000	0.722	0.233	0.767
34.5000	0.667	0.211	0.789
35.5000	0.667	0.194	0.806

Cut-off point	Sensitivity	1-Specificity	Specificity
36.5000	0.667	0.170	0.830
37.5000	0.639	0.162	0.838
38.5000	0.611	0.149	0.851
39.5000	0.583	0.129	0.871
40.5000	0.444	0.116	0.884
41.5000	0.444	0.103	0.897
42.5000	0.361	0.097	0.903
43.5000	0.278	0.088	0.912
44.5000	0.222	0.071	0.929
45.5000	0.222	0.063	0.938
46.5000	0.167	0.047	0.953
47.5000	0.167	0.041	0.959
48.5000	0.167	0.037	0.963
49.5000	0.111	0.032	0.968
50.5000	0.083	0.030	0.970
51.5000	0.083	0.013	0.987
52.5000	0.083	0.009	0.991
53.5000	0.056	0.006	0.994
55.0000	0.056	0.002	0.998
57.0000	0.000	0.000	1.000

Sensitivity, specificity, and predictive values. Thirty-six (7.20%) participants of the total sample scored above the optimal cut-off point of 33.3 on the HSCL-25 depression subscale. Of this number, 26 (72.22%) participants also met the diagnostic criteria for PDD on the SCID, so they

were true positives. Of these 36 participants, 10 (27.78%) participants scored below the optimal cut-off point on the HSCL-25 depression subscale, but met the diagnostic criteria for PDD, in other words they were false negatives.

Conversely, 464 participants of the total sample scored below the optimal cut-off point of 33.5 on the HSCL-25 depression subscale. However, 357 (77.00%) of these participants did not meet the diagnostic criteria for PDD, so they were true negatives. Of the 464, 107 (23.06%) participants scored above the optimal cut-off point on the HSCL-25 depression subscale, but did not meet the diagnostic criteria for PDD, in other words they were false positives.

The PPV was 20.00%, indicating that 20.00% of those participants who scored above the optimal cut-off point of 33.5 on the HSCL-25 depression subscale were correctly identified as cases for PDD. The NPV was 97.27%, indicating that 97.27% of the participants who scored below the optimal cut-off point of 33.5 were correctly identified as non-cases for PDD.

Table 30

Two-by-two table of HSCL-25 depression subscale vs SCID persistent depressive disorder diagnosis

	Positive (SCID)	n	Negative (SCID)	N	Total
HSCL $\geq$ 33.5	26 (true positive)	a	107 (false positive)	c	a+c = 133
HSCL $<$ 33.5	10 (false negative)	b	357 (true negative)	d	b+d = 367
Total		a+b = 36		c+d = 464	

Table 31

Sensitivity, specificity and predictive values of the HSCL-25 depression subscale with reference to the optimal cut-off point of 33.5

	Formula		**n**	**%**	
Sensitivity	= a / (a+b)	26/36	0.72	72.22%	[68.29, 76.15]
Specificity	= d / (c+d)	357/464	0.77	77.00%	[73.31, 80.69]
Positive predictive value (PPV)	= a / (a+c)	26/134	0.20	20.00%	[16.49, 23.51]
Negative predictive value (NPV)	= d / (b+d)	357/367	0.97	97.27%	[95.84, 98.7]

ROC analysis to determine PDD based on the BDI. In Figure 13, the ROC curve displays the area under the curve. The area under the curve of 82% (AUC = 0.82, 95% CI = 0.757-0.885) shows that the BDI is highly accurate in discriminating between PDD caseness and non-caseness.

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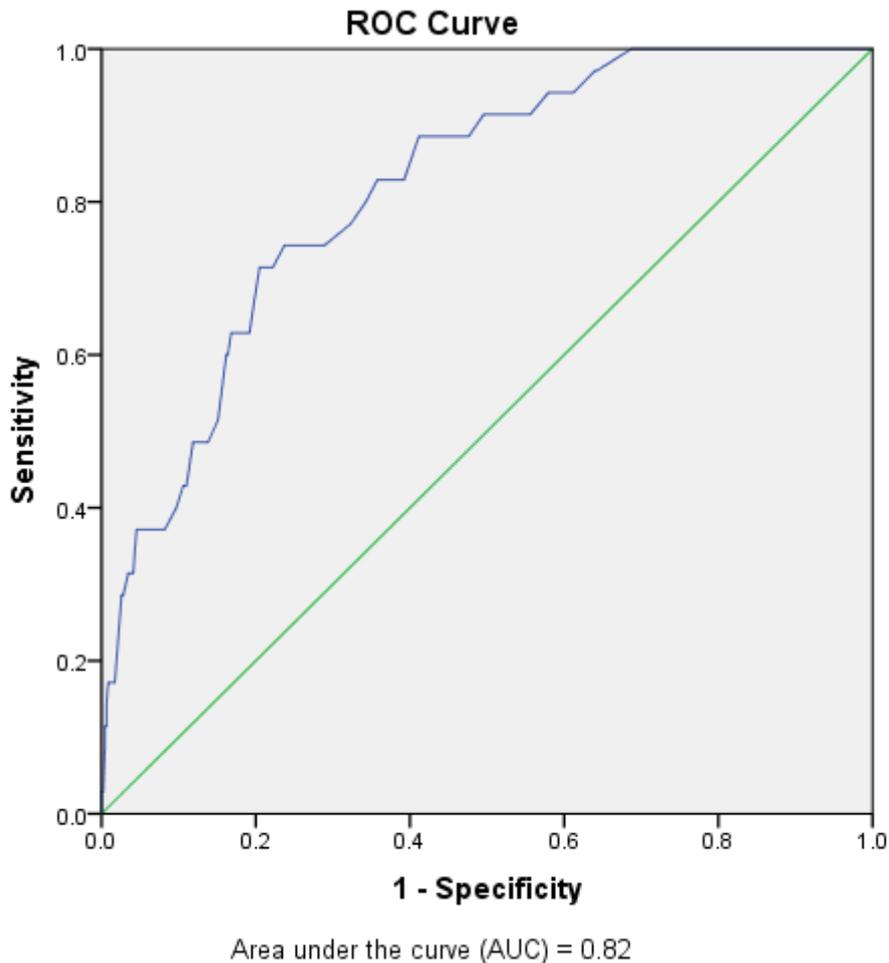
*Figure 13*   Receiver operating characteristic (ROC) curve for the diagnosis of PDD among the 500 people seeking HIV testing based on the BDI

Accuracy of the BDI cut-off points. Table 32 shows the sensitivity and specificity values for each possible cut-off point on the BDI. The highlighted cut-off point of 23.3 yielded optimal sensitivity (0.75) and specificity (0.76).

Table 32
ROC curve coordinates of the BDI using the SCID as the gold standard

Cut-off point	Sensitivity	1-Specificity	Specificity
-1.0000	1.000	1.000	0.000
.5000	1.000	0.942	0.058
1.0425	1.000	0.903	0.097
1.1942	1.000	0.901	0.099
1.6517	1.000	0.899	0.101
2.2138	1.000	0.862	0.138
2.5011	1.000	0.860	0.140
2.7872	1.000	0.858	0.142
3.4326	1.000	0.797	0.203
3.8925	1.000	0.795	0.205
3.9599	1.000	0.793	0.207
4.0247	1.000	0.748	0.252
4.5247	1.000	0.746	0.254
5.5000	1.000	0.731	0.269
6.5000	1.000	0.685	0.315
7.1165	0.972	0.640	0.360
7.6165	0.972	0.638	0.362
8.5000	0.944	0.610	0.390
9.5000	0.944	0.578	0.422
10.5000	0.917	0.554	0.446
11.0743	0.917	0.522	0.478
11.5743	0.917	0.519	0.481
12.1583	0.917	0.500	0.500

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Cut-off point	Sensitivity	1-Specificity	Specificity
12.6583	0.917	0.498	0.502
13.0603	0.889	0.478	0.522
13.5603	0.889	0.476	0.524
14.2371	0.889	0.446	0.554
14.7075	0.889	0.444	0.556
14.9703	0.889	0.442	0.558
15.2358	0.889	0.422	0.578
15.5193	0.889	0.420	0.580
15.7835	0.889	0.418	0.582
16.0867	0.889	0.407	0.593
16.5203	0.889	0.405	0.595
16.9336	0.889	0.403	0.597
17.5000	0.833	0.384	0.616
18.5000	0.833	0.360	0.640
19.0208	0.806	0.345	0.655
19.5208	0.806	0.343	0.657
20.5000	0.778	0.323	0.677
21.5000	0.750	0.291	0.709
22.5000	0.750	0.261	0.739
23.3289	0.750	0.244	0.756
23.8289	0.750	0.241	0.759
24.5000	0.722	0.226	0.774
25.0322	0.722	0.209	0.791
25.3678	0.722	0.207	0.793

Cut-off point	Sensitivity	1-Specificity	Specificity
25.8356	0.722	0.205	0.795
26.5000	0.639	0.192	0.808
27.5000	0.639	0.172	0.828
28.5000	0.611	0.168	0.832
29.1294	0.528	0.157	0.843
29.6294	0.528	0.155	0.845
30.3760	0.500	0.140	0.860
30.8760	0.500	0.138	0.862
31.5000	0.500	0.119	0.881
32.5000	0.444	0.110	0.890
33.0320	0.417	0.101	0.899
33.1915	0.417	0.099	0.901
33.3776	0.417	0.097	0.903
33.5839	0.417	0.095	0.905
33.8658	0.417	0.093	0.907
34.5000	0.389	0.078	0.922
35.1305	0.389	0.065	0.935
35.6305	0.389	0.063	0.938
36.5000	0.389	0.056	0.944
37.0305	0.389	0.047	0.953
37.5305	0.389	0.045	0.955
38.5000	0.333	0.043	0.957
39.5000	0.306	0.041	0.959
40.5000	0.306	0.034	0.966

Cut-off point	Sensitivity	1-Specificity	Specificity
41.5000	0.278	0.028	0.972
42.1032	0.167	0.019	0.981
42.5828	0.167	0.017	0.983
42.9796	0.167	0.015	0.985
43.5000	0.167	0.009	0.991
45.0000	0.139	0.006	0.994
46.5000	0.111	0.006	0.994
47.5000	0.111	0.004	0.996
49.0000	0.083	0.004	0.996
50.2471	0.028	0.002	0.998
50.4992	0.028	0.000	1.000
51.5041	0.000	0.000	1.000

Sensitivity, specificity, and predictive values with reference to the optimal cut-off point of 23.3. Thirty-six (7.20%) participants of the sample scored above the optimal cut-off point of 23.3 on the BDI. Of these participants, 27 (75.00%) participants also met the diagnostic criteria for PDD, showing that they were true positives. Of the 36 participants, 9 (25.00%) participants scored below the optimal cut-off point on the BDI, but met the diagnostic criteria for PDD, so they were false negatives.

Conversely, 464 (92.80%) participants of the total sample scored below the optimal cut-off point of 23.3 on the BDI. Of these participants, 353 (76.07%) did not meet the diagnostic criteria for PDD on the SCID, so they were true negatives. However, of the 464 participants, 111 (23.92%) participants scored above the optimal cut-off point on the BDI, but did not meet the diagnostic criteria for PDD, in other words they were false positives.

The PPV of 20.00% indicated that 20.00% of those participants who scored above the optimal cut-off point of 23.3 on the BDI were correctly identified as cases for PDD. The NPV of 98.00% indicated that 98.00% of the participants who scored below the optimal cut-off point of 23.3 were correctly identified as non-cases for PDD.

Table 33
Two-by-two table of BDI vs SCID persistent depressive disorder diagnosis

	Positive (SCID)	N	Negative (SCID)	N	Total
BDI ≥ 23.3	27 (true positive)	a	111 (false positive)	c	a+c = 138
BDI < 23.3	9 (false negative)	b	353 (true negative)	d	b+d = 362
Total		a+b = 36		c+d = 464	

Table 34
Sensitivity, specificity and predictive values of the BDI with reference to the optimal cut-off point of 23.3

	Formula	n	%	95% CI
Sensitivity	= a / (a+b)	27/36	0.75	75.00%	[71.2, 78.8]
Specificity	= d / (c+d)	353/464	0.76	76.07%	[72.33, 79.81]
Positive predictive value (PPV)	= a / (a+c)	27/138	0.20	20.00%	[16.49, 23.51]
Negative predictive value (NPV)	= d / (b+d)	353/362	0.98	98.00%	[96.77, 99.23]

Screening for Anxiety Disorders

This section reports on the performance of the HSCL-25, HSCL-25 anxiety subscale and BAI as screening tools for the accurate detection of generalized anxiety disorder.

ROC curve in determining generalized anxiety disorder based on the HSCL-25. In Figure 14, the ROC curve displays the area under the curve. The ROC curve shows that the HSCL-25 performed very well as a predictor of generalized anxiety disorder (GAD), with an AUC of 87% (AUC = 0.87, 95% CI = 0.796-0.935).
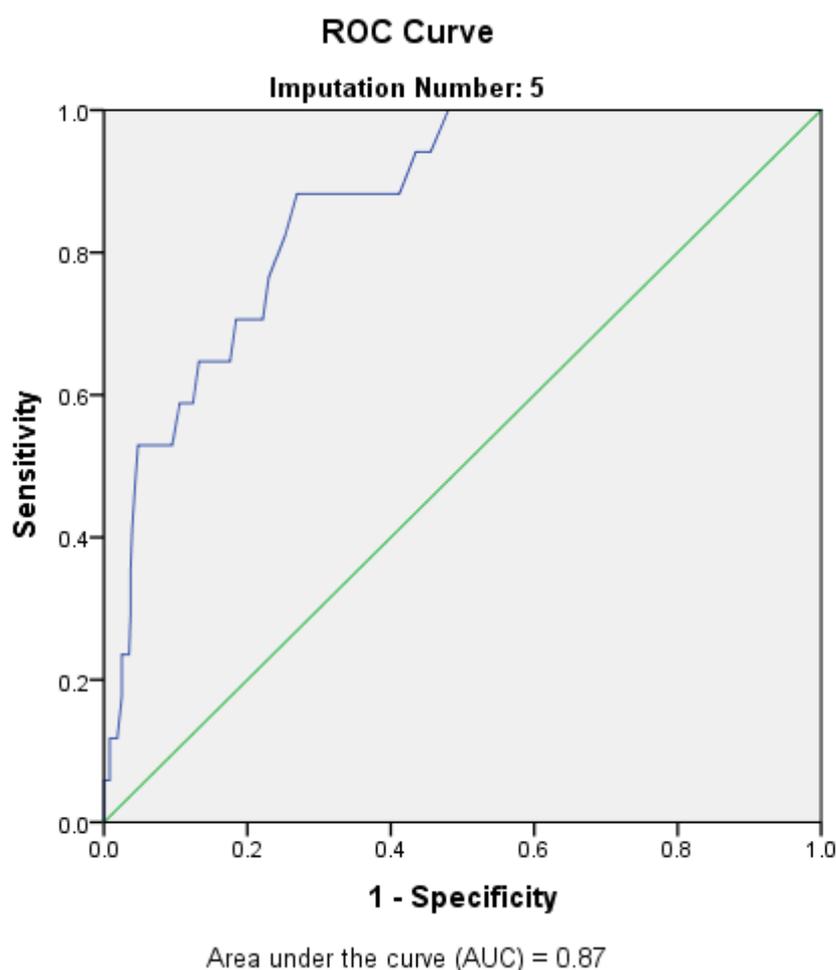
Figure 14   Receiver operating characteristic (ROC) curve for the diagnosis of GAD among the 500 people seeking HIV testing based on the HSCL-25

Accuracy of the HSCL-25 cut-off points. Table 35 shows the sensitivity and specificity values for each possible cut-off point on the HSCL-25. The highlighted cut-off point of 54.5 yielded optimal sensitivity (0.77) and specificity (0.77).

Table 35
ROC curve coordinates of the HSCL-25 using the SCID as the gold standard

Cut-off point	Sensitivity	1-Specificity	Specificity
23.0000	1.000	1.000	0.000
24.5000	1.000	0.961	0.039
25.5000	1.000	0.932	0.068
26.5000	1.000	0.903	0.097
27.5000	1.000	0.872	0.128
28.5000	1.000	0.845	0.155
29.5000	1.000	0.797	0.203
30.5000	1.000	0.752	0.248
31.5000	1.000	0.723	0.277
32.5000	1.000	0.689	0.311
33.5000	1.000	0.652	0.348
34.5000	1.000	0.621	0.379
35.5000	1.000	0.588	0.412
36.5000	1.000	0.569	0.431
37.5000	1.000	0.547	0.453
38.5000	1.000	0.509	0.491
39.5000	1.000	0.480	0.520
40.5000	0.941	0.455	0.545
41.5000	0.941	0.435	0.565
42.5000	0.882	0.412	0.588

Cut-off point	Sensitivity	1-Specificity	Specificity
43.5000	0.882	0.395	0.605
44.5000	0.882	0.385	0.615
45.5000	0.882	0.375	0.625
46.5000	0.882	0.352	0.648
47.5000	0.882	0.335	0.665
48.5000	0.882	0.317	0.683
49.5000	0.882	0.304	0.696
50.5000	0.882	0.296	0.704
51.5000	0.882	0.286	0.714
52.5000	0.882	0.269	0.731
53.5000	0.824	0.253	0.747
54.5000	0.765	0.230	0.770
55.5000	0.706	0.222	0.778
56.5000	0.706	0.211	0.789
57.5000	0.706	0.195	0.805
58.5000	0.706	0.184	0.816
59.5000	0.647	0.176	0.824
60.5000	0.647	0.172	0.828
61.5000	0.647	0.164	0.836
62.5000	0.647	0.151	0.849
63.5000	0.647	0.137	0.863
64.5000	0.647	0.133	0.867
65.5000	0.588	0.124	0.876
66.5000	0.588	0.112	0.888

Cut-off point	Sensitivity	1-Specificity	Specificity
67.5000	0.588	0.106	0.894
68.5000	0.529	0.095	0.905
69.5000	0.529	0.081	0.919
70.5000	0.529	0.077	0.923
71.5000	0.529	0.072	0.928
72.5000	0.529	0.064	0.936
73.5000	0.529	0.060	0.940
74.5000	0.529	0.048	0.952
75.5000	0.412	0.039	0.961
76.5000	0.353	0.037	0.963
77.5000	0.294	0.037	0.963
78.5000	0.235	0.035	0.965
79.5000	0.235	0.025	0.975
81.0000	0.176	0.025	0.975
82.5000	0.118	0.019	0.981
83.5000	0.118	0.014	0.986
84.5000	0.118	0.012	0.988
86.0000	0.118	0.008	0.992
87.5000	0.059	0.008	0.992
89.0000	0.059	0.006	0.994
90.5000	0.059	0.004	0.996
91.5000	0.059	0.002	0.998
92.5000	0.059	0.000	1.000
94.0000	0.000	0.000	1.000

Sensitivity, specificity, and predictive values with reference to the optimal cut-off point of 54.5. Seventeen (3.40%) participants of the total sample scored above the optimal cut-off point of 54.5 on the HSCL-25. Of these 17 participants, 13 (77.00%) also met the diagnostic criteria for GAD, meaning that they were true positives. Of the 17 participants, 4 (23.53%) scored below the optimal cut-off point on the HSCL-25, but met the diagnostic criteria for GAD, so they were false negatives.

Conversely, 483 (96.60%) participants of the total sample scored below the optimal cut-off point of 54.5 on the HSCL-25. Of these 483 participants, 372 (77.02%) did not meet the diagnostic criteria for GAD as they were true negatives. However, of the 483 participants, 111 (22.98%) participants scored above the optimal cut-off point on the HSCL-25, but did not meet the diagnostic criteria for GAD, in other words they were false positives.

The PPV of 10.48% indicated that 10.48% of those participants who scored above the optimal cut-off point of 54.5 on the HSCL-25 were correctly identified as cases for GAD. The NPV of 99.00% indicated that 99.00% of the participants who scored below the optimal cut-off point of 54.5 were correctly identified as non-cases for GAD.

Table 36
Two-by-two table of HSCL-25 vs SCID generalized anxiety disorder diagnosis

	Positive (SCID)	n	Negative (SCID)	N	Total
HSCL ≥ 54.5	13 (true positive)	a	111 (false positive)	c	a+c = 124
HSCL < 54.5	4 (false negative)	b	372 (true negative)	d	b+d = 376
Total		a+b = 17		c+d = 483	

Table 37

Sensitivity, specificity and predictive values of the HSCL-25 with reference to the optimal cut-off point of 54.5

	Formula		**n**	**%**	**95% CI**
Sensitivity	= a / (a+b)	13/17	0.77	77.00%	[73.31, 80.69]
Specificity	= d / (c+d)	372/483	0.77	77.02%	[73.32, 80.7]
Positive predictive value (PPV)	= a / (a+c)	13/124	0.10	10.48%	[7.8, 13.16]
Negative predictive value (NPV)	= d / (b+d)	372/376	0.99	99.00%	[98.13, 99.87]

ROC curve in determining generalized anxiety disorder based on the HSCL-25 anxiety subscale. In Figure 15, the ROC curve displays the area under the curve. The ROC curve shows that the HSCL-25 anxiety subscale performed very well as a predictor of generalized anxiety disorder (GAD), with an AUC of 88% (AUC = 0.88, 95% CI = 0.825-0.934).

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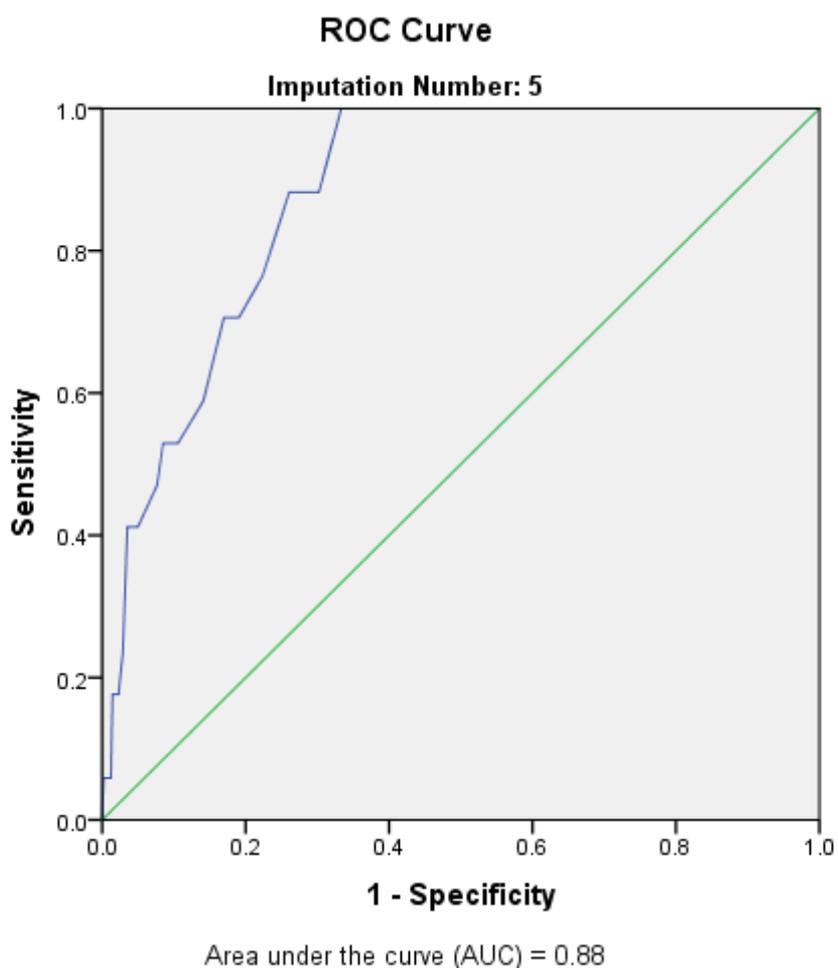
Figure 15   Receiver operating characteristic (ROC) curve for the diagnosis of GAD among the
500 people seeking HIV testing based on the HSCL-25 anxiety subscale

Accuracy of the HSCL-25 anxiety subscale cut-off points. Table 38 shows the sensitivity

and specificity values for each possible cut-off point on the HSCL-25 anxiety subscale. The

highlighted optimal cut-off point of 21.5 yielded optimal sensitivity (0.77) and specificity (0.78).

The optimal cut-off point of 21.5 shows that the HSCL-anxiety subscale correctly identified 77% of

individuals who had GAD and 78% who did not have GAD.

Table 38
ROC curve coordinates of the HSCL-25 anxiety subscale using the SCID as the gold standard

Cut-off point	Sensitivity	1-Specificity	Specificity
9.0000	1.000	1.000	0.000
10.5000	1.000	0.907	0.093
11.5000	1.000	0.812	0.188
12.5000	1.000	0.723	0.277
13.5000	1.000	0.625	0.375
14.5000	1.000	0.557	0.443
15.5000	1.000	0.493	0.507
16.5000	1.000	0.439	0.561
17.5000	1.000	0.387	0.613
18.5000	1.000	0.333	0.667
19.5000	0.882	0.302	0.698
20.5000	0.882	0.261	0.739
21.5000	0.765	0.224	0.776
22.5000	0.706	0.190	0.810
23.5000	0.706	0.170	0.830
24.5000	0.588	0.141	0.859
25.5000	0.529	0.106	0.894
26.5000	0.529	0.085	0.915
27.5000	0.471	0.077	0.923
28.5000	0.412	0.050	0.950
29.5000	0.412	0.035	0.965
30.5000	0.353	0.033	0.967
31.5000	0.235	0.029	0.971

Cut-off point	Sensitivity	1-Specificity	Specificity
32.5000	0.176	0.023	0.977
33.5000	0.176	0.017	0.983
34.5000	0.176	0.014	0.986
35.5000	0.059	0.012	0.988
36.5000	0.059	0.008	0.992
37.5000	0.059	0.006	0.994
38.5000	0.059	0.002	0.998
40.0000	0.000	0.000	1.000

Sensitivity, specificity, and predictive values with reference to the optimal cut-off point of 21.5. In Table 39, 17 (3.40%) participants of the total sample (n=500) scored above the optimal cut-off point of 21.5 on the HSCL-25 anxiety subscale. Of these 17 participants, 13 (77.00%) participants also met the diagnostic criteria for GAD, in other words they were true positives. However, of the 17 participants, 4 (23.53%) scored below the optimal cut-off point on the HSCL-25 anxiety subscale, but met the diagnostic criteria for GAD, so they were false negatives.

Conversely, 483 (96.60%) participants of the total sample scored below the optimal cut-off point of 21.5 on the HSCL-25 anxiety subscale. Of these 483 participants, 377 (78.05%) did not meet the diagnostic criteria for GAD as they were true negatives. Of the 483 participants, 106 (21.95%) participants scored above the optimal cut-off point on the HSCL-25 anxiety subscale, but did not meet the diagnostic criteria for GAD, indicating that they were false positives.

Table 40 shows that the PPV was 11.00%, indicating that 11.00% of those participants who scored above the optimal cut-off point of 21.5 on the HSCL-25 anxiety subscale were correctly identified as cases for GAD. The NPV of 99.00% indicated that 99.00% of the participants who scored below the optimal cut-off point of 21.5 were correctly identified as non-cases for GAD.

Table 39

Two-by-two table of HSCL-25 anxiety subscale vs SCID generalized anxiety disorder diagnosis

	Positive (SCID)	**n**	**Negative (SCID)**	**N**	**Total**
HSCL ≥ 21.5	13 (true positive)	a	106 (false positive)	c	a+c = 119
HSCL < 21.5	4 (false negative)	b	377 (true negative)	d	b+d = 381
Total		a+b = 17		c+d = 483	

Table 40

Sensitivity, specificity and predictive values of the HSCL-25 anxiety subscale with reference to the optimal cut-off point of 21.5

	Formula		**n**	**%**	**95% CI**
Sensitivity	= a / (a+b)	13/17	0.77	77.00%	[73.31, 80.69]
Specificity	= d / (c+d)	377/483	0.78	78.05%	[74.42, 81.68]
Positive predictive value (PPV)	= a / (a+c)	13/119	0.11	11.00%	[8.26, 13.74]
Negative predictive value (NPV)	= d / (b+d)	377/381	0.99	99.00%	[98.13, 99.87]

ROC curve in determining generalized anxiety disorder based on the BAI. Figure 16 displays the area under the curve as calculated by ROC analysis. The ROC curve shows that the BAI performed excellently as a predictor of generalized anxiety disorder (GAD), with an AUC of 86% (AUC = 0.86, 95% CI = 0.762-0.950).
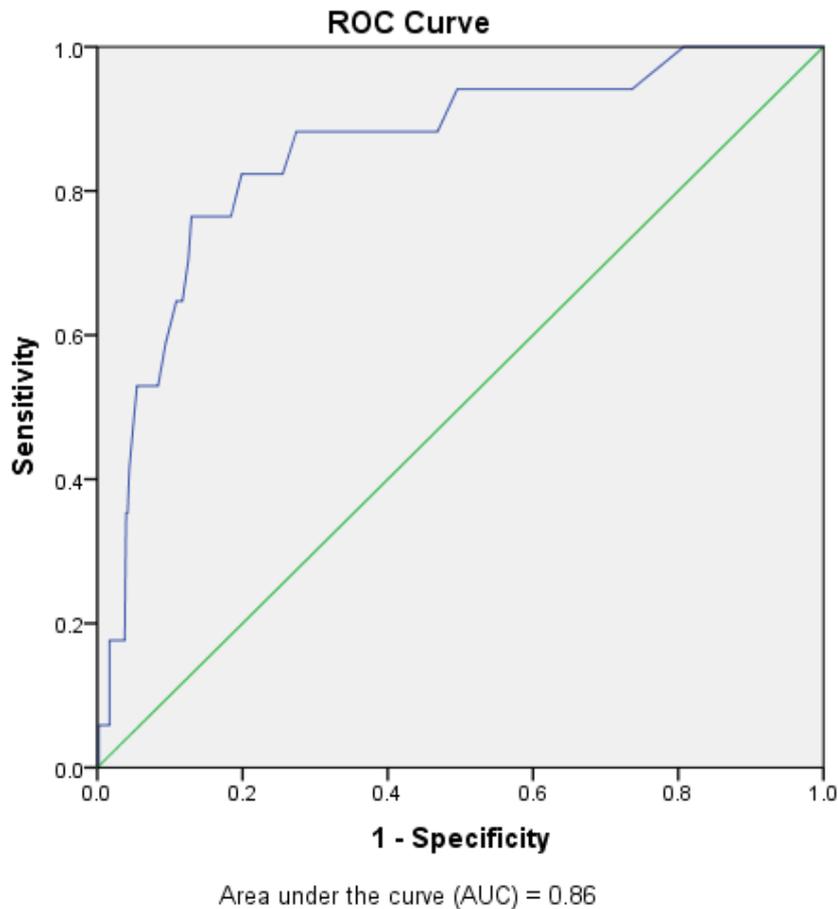
Figure 16   Receiver operating characteristic (ROC) curve for the diagnosis of GAD among the 500 people seeking HIV testing based on the BAI

Accuracy of the BAI cut-off points. Table 41 shows the sensitivity and specificity values for each possible cut-off point on the BAI. The highlighted cut-off point of 21.5 yielded optimal sensitivity (0.82) and specificity (0.80).

Table 41
ROC curve coordinates of the BAI using the SCID as the gold standard

Cut-off point	Sensitivity	1-Specificity	Specificity
-1.0000	1.000	1.000	0.000
.5000	1.000	0.874	0.126
1.5000	1.000	0.805	0.195
2.5000	0.941	0.735	0.265
3.5000	0.941	0.692	0.308
4.5000	0.941	0.627	0.373
5.5000	0.941	0.590	0.410
6.5000	0.941	0.538	0.462
7.5000	0.941	0.497	0.503
8.5000	0.882	0.470	0.530
9.5000	0.882	0.435	0.565
10.5000	0.882	0.414	0.586
11.5000	0.882	0.383	0.617
12.5000	0.882	0.356	0.644
13.5000	0.882	0.335	0.665
14.5000	0.882	0.311	0.689
15.5000	0.882	0.288	0.712
16.5000	0.882	0.271	0.729
17.5000	0.824	0.253	0.747
18.5000	0.824	0.238	0.762
19.5000	0.824	0.222	0.778
20.5000	0.824	0.213	0.787
21.5000	0.824	0.197	0.803

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Cut-off point	Sensitivity	1-Specificity	Specificity
22.5000	0.765	0.182	0.818
23.5000	0.765	0.161	0.839
24.5000	0.765	0.145	0.855
25.5000	0.765	0.137	0.863
26.5000	0.765	0.130	0.870
27.5000	0.706	0.126	0.874
28.5000	0.647	0.118	0.882
29.5000	0.647	0.110	0.890
30.5000	0.588	0.095	0.905
31.5000	0.529	0.085	0.915
32.5000	0.529	0.081	0.919
33.5000	0.529	0.079	0.921
34.5000	0.529	0.075	0.925
35.5000	0.529	0.066	0.934
36.5000	0.529	0.056	0.944
37.5000	0.412	0.046	0.954
39.0000	0.353	0.043	0.957
40.5000	0.353	0.041	0.959
41.5000	0.176	0.037	0.963
42.5000	0.176	0.035	0.965
43.5000	0.176	0.029	0.971
44.5000	0.176	0.021	0.979
45.5000	0.176	0.019	0.981
46.5000	0.176	0.017	0.983

Cut-off point	Sensitivity	1-Specificity	Specificity
48.0000	0.059	0.017	0.983
50.5000	0.059	0.014	0.986
53.0000	0.059	0.012	0.988
55.0000	0.059	0.010	0.990
56.5000	0.059	0.008	0.992
58.5000	0.059	0.006	0.994
61.0000	0.059	0.002	0.998
62.5000	0.000	0.002	0.998
64.0000	0.000	0.000	1.000

Sensitivity, specificity, and predictive values with reference to the optimal cut-off point of 21.5. In Table 42, 17 (3.40%) participants of the total sample scored above the optimal cut-off point of 21.5 on the BAI. Of these 17 participants, 14 (82.35%) participants also met the diagnostic criteria for GAD, so they were true positives. Conversely, of the 17 participants, 3 (17.65%) scored below the optimal cut-off point on the BAI, but met the diagnostic criteria for GAD, in other words they were false negatives.

Conversely, 483 (96.60%) participants of the total sample scored below the optimal cut-off point of 21.5 on the BAI. Of these 483 participants, 386 (80.00%) did not meet the diagnostic criteria for GAD as they were true negatives. However, of the 483 participants, 97 (20.08%) participants scored above the optimal cut-off point on the HSCL-25 anxiety subscale, but did not meet the diagnostic criteria for GAD, so they were false positives.

As can be seen in Table 43, the PPV of 13.00% indicates that 13.00% of those participants who scored above the optimal cut-off point of 21.5 on the BAI were correctly identified as cases for

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GAD. The NPV of 99.23% indicates that 99.23% of the participants who scored below the optimal cut-off point of 21.5 on the BAI were correctly identified as non-cases for GAD.

Table 42
Two-by-two table of BAI vs SCID generalized anxiety disorder diagnosis

	Positive (SCID)	n	Negative (SCID)	N	Total
BAI ≥ 21.5	14 (true positive)	a	97 (false positive)	c	a+c = 111
BAI < 21.5	3 (false negative)	b	386 (true negative)	d	b+d = 389
Total		a+b = 17		c+d = 483	

Table 43
Sensitivity, specificity and predictive values of the BAI with reference to the optimal cut-off point of 21.5

	Formula	n	%	95% CI
Sensitivity	= a / (a+b)	14/17	0.82	82.35%	[79.01, 85.69]
Specificity	= d / (c+d)	386/483	0.80	80.00%	[76.49, 83.51]
Positive predictive value (PPV)	= a / (a+c)	14/111	0.13	13.00%	[10.05, 15.95]
Negative predictive value (NPV)	= d / (b+d)	386/389	0.99	99.23%	[98.46, 100]

Screening for alcohol use disorder

This section reports on the performance of the AUDIT as screening tool for the accurate detection of alcohol use disorder (AUD).

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ROC curve in determining alcohol use disorder based on the AUDIT. Figure 17 displays

the area under the curve yielded by the ROC analysis. The ROC curve shows that the AUDIT

performed excellently as a predictor of alcohol use disorder (AUD), with an AUC of 91% (AUC =

0.91, 95% CI = 0.879-0.933).

ROC Curve

Imputation Number: Original data

Area under the curve (AUC) = 0.91
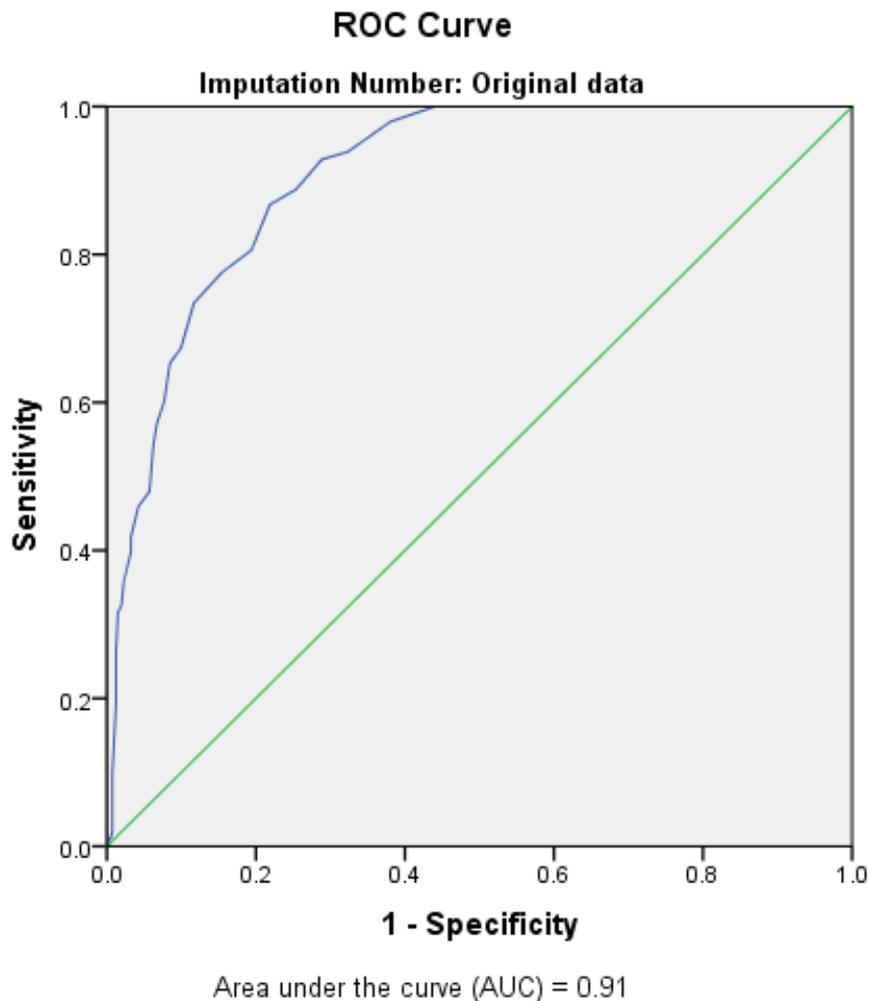
Figure 17   Receiver operating characteristic (ROC) curve for the diagnosis of AUD among the
500 people seeking HIV testing based on the AUDIT

Accuracy of the AUDIT cut-off points. Table 44 shows the sensitivity and specificity values

for each possible cut-off point on the AUDIT. The cut-off point of 8.5 yielded the optimal

sensitivity (0.81) and specificity (0.81).

Table 44

ROC curve coordinates of the AUDIT using the SCID as the gold standard

Cut-off point	Sensitivity	1-Specificity	Specificity
-1.0000	1.000	1.000	0.000
.5000	1.000	0.550	0.450
1.5000	1.000	0.498	0.502
2.5000	1.000	0.440	0.560
3.5000	0.980	0.381	0.619
4.5000	0.939	0.323	0.677
5.5000	0.929	0.289	0.711
6.5000	0.888	0.254	0.746
7.5000	0.867	0.219	0.781
8.5000	0.806	0.194	0.806
9.5000	0.776	0.154	0.846
10.5000	0.735	0.117	0.883
11.5000	0.673	0.100	0.900
12.5000	0.653	0.085	0.915
13.5000	0.602	0.077	0.923
14.5000	0.571	0.067	0.933
15.5000	0.541	0.062	0.938
16.5000	0.480	0.057	0.943
17.5000	0.459	0.042	0.958
18.5000	0.418	0.032	0.968
19.5000	0.398	0.032	0.968
20.5000	0.357	0.022	0.978
21.5000	0.327	0.020	0.980

Cut-off point	Sensitivity	1-Specificity	Specificity
22.5000	0.316	0.015	0.985
23.5000	0.265	0.012	0.988
24.5000	0.235	0.012	0.988
25.5000	0.194	0.012	0.988
26.5000	0.102	0.007	0.993
27.5000	0.082	0.007	0.993
28.5000	0.071	0.007	0.993
29.5000	0.051	0.007	0.993
30.5000	0.031	0.007	0.993
31.5000	0.020	0.007	0.993
32.5000	0.010	0.005	0.995
33.5000	0.010	0.002	0.998
36.0000	0.000	0.002	0.998
39.0000	0.000	0.000	1.000

Sensitivity, specificity, and predictive values with reference to the optimal cut-off point of 8.5. In Table 45, 98 (19.60%) participants of the total sample scored above the optimal cut-off point of 8.5 on the AUDIT. Of these 98 participants, 79 (81.00%) participants also met the diagnostic criteria for AUD, so they were true positives. Conversely, of the 98 participants, 19 (19.39%) scored below the optimal cut-off point on the AUDIT, but met the diagnostic criteria for AUD, which means they were false negatives.

Of the total sample of 500 participants, 402 (80.40%) scored below the optimal cut-off point of 8.5 on the AUD. Of these 402 participants, 326 (81.09%) did not meet the diagnostic criteria for AUD, so they were true negatives. However, of the 402 participants, 76 (18.91%) participants

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scored above the optimal cut-off point on the AUDIT, but did not meet the diagnostic criteria for AUD, so they were false positives.

As can be seen in Table 46, the PPV was 51.00%, indicating that 51.00% of those participants who scored above the optimal cut-off point of 8.5 on the AUDIT were correctly identified as cases for AUD. The NPV of 95.00% indicates that 95.00% of the participants who scored below the optimal cut-off point of 8.5 on the AUDIT were correctly identified as non-cases for AUD.

Table 45
Two-by-two table of AUDIT vs SCID alcohol use disorder diagnosis

	Positive (SCID)	n	Negative (SCID)	N	Total
AUDIT $\geq$ 8.5	79 (true positive)	a	76 (false positive)	c	a+c = 155
AUDIT $<$ 8.5	19 (false negative)	b	326 (true negative)	d	b+d = 345
Total		a+b = 98		c+d = 402	

Table 46

Sensitivity, specificity and predictive values of the AUDIT with reference to the optimal cut-off point of 8.5

	Formula		n	%	95% CI
Sensitivity	= a / (a+b)	79/98	0.81	81.00%	[77.56, 84.44]
Specificity	= d / (c+d)	326/402	0.81	81.09%	[77.66, 84.52]
Positive predictive value (PPV)	= a / (a+c)	79/155	0.51	51.00%	[46.62, 55.38]
Negative predictive value (NPV)	= d / (b+d)	326/345	0.95	95.00%	[93.09, 96.91]

Odds ratio of alcohol use disorder with regard to past alcohol use disorder compared to no past alcohol use disorder. In Table 47, 98 (19.60%) participants of the total sample met the criteria for current alcohol use disorder (AUD). Of these 98 participants, 67 (68.37%) also met the criteria for past AUD and 28 (28.57%) did not. Conversely, 402 (80.40%) participants of the total sample did not meet the diagnostic criteria for current AUD. Of these 402 participants, 110 participants met the criteria for past AUD and 236 did not.

As can be seen in Table 48, the odds ratio for past AUD as a risk factor for current AUD was 5.13 (OR = 5.13, 95% CI= 3.13, 8.43; p = 0.0001). This means that persons who had current AUD were more than 5 times more likely to have had past AUD than persons with no current AUD.

Table 47

Two-by-two table of current AUD vs Past AUD

	Current AUD (positive)	n	Current AUD (negative)	N	Total
Past AUD case (positive)	67	a	110	b	a+b = 177
Past AUD non-case (negative)	28	c	236	d	c+d = 264
Total		a+b = 98		c+d = 402	

Table 48

Odds Ratio of Current AUD vs Past AUD

	Formula		OR	95% CI
Odds ratio	$= \dfrac{a/c}{b/d}$ $= \dfrac{ad}{bc}$	$= \dfrac{40 \ x \ 377}{51 \ x \ 32}$	= 5.13	[3.13, 8.43]

a = Number of exposed cases

= participants with current AUD assessed as having past AUD

b = Number of exposed non-cases

= participants with no current AUD assessed as having past AUD

c = Number of unexposed cases

= participants with current AUD not assessed as having past AUD

d = Number of unexposed non-cases

= participants with no current AUD not assessed as having past AUD

Summary of the test characteristics of the mood disorders, generalized anxiety, and alcohol use disorders

The results show that 28.40% (95% CI [24.45, 32.35]) of the sample met the diagnostic criteria for at least one of CMDs, with no significant difference in the prevalence rates regarding gender. Of the sample, 41.20% had elevated levels of distress as assessed with the HSCL-25; 21.40% scored in the moderate to severe ranges on the BDI, and 13.60% scored in the moderate to severe range on the BAI. It is evident that a greater percentage of the sample reported the symptoms of depression (21.40%) rather than anxiety (13.60%). The results also demonstrated that the Hopkins Symptom Checklist (HSCL-25), HSCL-Depression and anxiety-subscales, BDI, BAI, and AUDIT were effective in identifying major depressive, persistent depressive, generalized anxiety, and alcohol use disorder. However, a high number of false positive cases was identified for these scales and a specificity rate of 100% would be ideal to avoid false positive cases (Sheehan and McGee, 2013). For the present study, the specificity rates for most of the scales were further from 100% and yielded high false positives. Notably, the AUDIT had a lower proportion of false positives compared to the other scales. A possible reason may be that the specificity of 81% for the AUDIT was higher than those for the other scales. Lastly, it is noteworthy that past MDD and past AUD were highly effective risk factors for current MDD (OR = 9.24; 95% CI= 5.34, 16.00) and current AUD (OR = 5.13; 95% CI = 3.13, 8.43), respectively. These results are discussed in more detail in the next chapter.

Chapter 5: Discussion

Introduction

The present chapter discusses the prevalence and the symptomatology of major depression, past major depression, persistent depressive, generalized anxiety, and alcohol use disorder in the context of the existing literature. Thereafter, a discussion on the performance of the self-report measures as screening tools for psychological distress, major depressive, persistent depressive, generalized anxiety, and alcohol use disorder against the structured clinical interview for the DSM (SCID) as gold standard is presented. The chapter ends with a brief summary of the main findings of the research.

The prevalence of common mental disorders compared to previous studies

The prevalence of any diagnosis compared to previous studies. The findings of the SCID data demonstrate that 28.40% of the sample of individuals seeking HIV testing were diagnosed with at least one common mental disorder (CMD). In the current study, no significant differences were found in the prevalence of CMDs with regard to gender. Similarly, among South African HIV-infected individuals no significant gender differences were found in the prevalence of mood disorders when using the MINI International Neuropsychiatric Interview (MINI) (Olley et al., 2003). However, Olley et al. (2003) report that more females were likely to have a significant diagnosis of PTSD than males ($x^2 = 5.18$, df = 1, $p = 0.02$). These authors also found that compared to females, males were more likely to have met the diagnostic criteria for alcohol abuse ($x^2 = 24.56$, df = 1, $p < 0.001$) or alcohol dependence ($x^2 = 16.08$, df = 1, $p < 0.001$) (Olley et al., 2003). No significant differences were found between employment and unemployment and the prevalence estimates of current MDD, current and past AUD, except for past MDD, PDD and MIDD. Surprisingly, these results are different from those in the general population, which showed that the unemployed had significantly higher rates of psychopathology (Jenkins, Mbatia, Singleton, & White, 2010). I also found no significant association between Afrikaans and English speakers and

the rate of CMDs, except for MIDD and current AUD. This finding is in contrast with a study done by Spies et al. (2009), where the prevalence rates for psychiatric disorders were higher for Afrikaans-speaking individuals across all disorders. Spies et al. (2009) speculated that Afrikaans-speaking individuals may have been more comfortable speaking about emotional symptoms. Furthermore, the most common mental disorder found among the present sample was past alcohol use disorder (35.40%), followed by current alcohol use disorder (19.60%), past major depression (18.20%), current major depression (14.40%), persistent depressive disorders (7.20%), generalized anxiety disorder (3.40%) and medication-induced depressive disorder (0.80%).

The prevalence rates estimated in the present study are higher than those reported in the South African Stress and Health (SASH) study using the CIDI (Herman et al., 2009). In this nationally representative study conducted in the general population, the overall prevalence of any mental disorder was 16.5%, among which 11% had only one disorder. In the SASH study, the 12-month prevalence of MDD was estimated at 4.9%, followed by alcohol abuse (4.5%), GAD (1.4%), alcohol dependence (1.2%) and PTSD (0.6%) (Herman et al., 2009). Conversely, the prevalence rates in the current sample were lower than among South African HIV-infected individuals using the MINI (Olley et al., 2003). Olley et al. (2003) reported that 56% of patients were diagnosed with a mental disorder. These authors further reported that major depression (34.9%), dysthymic disorder (21.5%), post-traumatic stress disorder (14.8%), and alcohol dependence were most common (10.1%) (Olley et al., 2003). The high rates of CMDs among people seeking HIV testing compared to the CIDI rates in the general population may have several reasons. It is likely that individuals going for an HIV test may have experienced significant distress, which is in keeping with the study by Sahay et al. (2007). The individuals may also have been engaging in high-risk behaviours that encouraged them to go for an HIV test (Sahay et al., 2007). The higher MINI rates, on the other hand, may be attributable to the increased association between HIV and CMDs due to the continued stigma of HIV and poverty (Myer et al., 2008).

The prevalence rates of CMDs reported in the present study also exceeded those reported among an American general population sample of men and women in the National Comorbidity Survey Replication (NCS-R). In the NCS-R, for any disorder the sample reported a 12-month prevalence rate of 26.6%, while 14.4% of the sample met the diagnostic criteria for at least one disorder (Kessler et al., 2005). Kessler et al. (2005) found that the 12-month prevalence of specific phobia was 8.7%, followed by social phobia (6.8%), and major depressive disorder (6.7%). These authors also reported lower prevalence rates than the current study for generalized anxiety disorder (3.1%), alcohol abuse (3.1%), alcohol dependence (1.3%) and dysthymia (1.5%) (Kessler et al. 2005). Therefore, it appears that the prevalence of CMDs among the sample of HIV test seekers in this study was higher than that found among both USA and South African general population samples (Kessler et al., 2005; Herman et al., 2009).

The wide variability in the rates of CMDs, such as MDD, PDD, GAD and AUD, can be attributed to several factors. These factors include methodological challenges in assessing CMDs. For example, the SCID-5 is time-consuming and has to be administered by a trained healthcare professional (APA, 2014). The CIDI and MINI, on the other hand, are diagnostic interviews administered by non-specialized interviewers (Lecrubier et al., 1997). Furthermore, different population groups of interest were included, whether the study population consisted of individuals living with HIV or individuals seeking HIV testing.

The prevalence of specific diagnosis compared to previous studies

The prevalence of major depression. The prevalence of major depressive disorder (MDD) obtained in this study was 14.40% among persons seeking HIV testing. The observed prevalence of the present study was also comparable to that of 8.1% reported by Kinyanda et al. (2011) in Uganda, 11.4% reported by Adewuya et al. (2007) in Nigeria, 14% reported by Myer et al. (2008) in South Africa, and 11.1% reported by Freeman et al. (2007) in South Africa. All four studies mentioned above were conducted in sub-Saharan Africa among HIV-positive patients and used

structured clinical interviews, such as the CIDI and MINI, to make a diagnosis of MDD. However, other studies undertaken in both South Africa and Uganda using structured clinical interviews such as the MINI and the CIDI among HIV/AIDS samples, reported rates of MDD as high as 40.0% (Olley et al., 2006; Nakimuli-Mpungu, & Munyaneza, 2011).

Similar results were found among an American end-stage renal disease (ESRD) sample using the SCID (Hedayati et al., 2006). Hedayati et al. (2005) reported the prevalence of a depressive disorder to be 26.5% and the prevalence of MDD as 17.3%. The prevalence of MDD in patients with HIV/AIDS in the USA was 72.9% using the SCID (Berger-Greenstein et al., 2007). Berger-Greenstein et al. (2007) and other researchers (e.g. Rabkin et al., 2000; Atkinson et al., 1988; Dew et al., 1997) argue that demographic or behavioural factors such as socio-economic factors, gender, intravenous drug use and traumatic exposure to things other than HIV increases the vulnerability to mental illness. For example, the available evidence suggests that the prevalence of major depression was found to be highest among those at the lowest socio-economic levels (Bhagwanjee et al., 1998).

In addition, in keeping with previous research, past major depression was 18.2%. For example, among newly diagnosed breast cancer patients in the USA, the prevalence of a history of MDD on the SCID was 20% (Palmer et al., 2012). Moreover, evidence gathered from this study suggests that lifetime history of major depression (past major depression) increases the likelihood of current major depression prior to HIV testing. Similarly, even though different samples were used, Kagee and Martin (2010) reported that lifetime history of depression augmented the odds of depression following an HIV diagnosis. Furthermore, no research on major depression among persons seeking HIV testing in South Africa using diagnostic interviews was available. However, the baseline study of 242 women (Rochat et al., 2006) found high rates of depressed mood (41%) among individuals coming for HIV testing using the EPDS screening measure.

The prevalence of persistent depressive disorder. The prevalence found for PDD (7.20%) in this sample was higher than that found in the SASH study (Willams et al., 2007). For example,

Williams et al. (2007) found PDD (dysthymia) rates of 0.7% among 4351 South African adults in the general population using the WMH-CIDI. This finding was important as there was increasing evidence that PDD may cause significant somatic, social and occupational impairment (Weissman et al., 1988; Friedman, 1993, Leader & Klein, 1996; Browne et al., 1999). However, the baseline prevalence of PDD among 149 HIV-positive South African individuals using the MINI was higher than that of the current study (Olley et al., 2006). Olley et al. (2006) report that 21.5% of their sample were diagnosed with PDD. At the follow-up visit six months after the baseline assessment, the prevalence rate of PDD (3.1%) was much lower than that of the current study (Olley et al., 2006). In the USA among newly diagnosed breast cancer patients using the SCID, the prevalence of PDD (2%) was lower than the current prevalence rate (Palmer et al., 2012). The differences in prevalence rates can be attributed to the differences in the socio-economic statuses of the individuals and the discrepancies in the measuring instruments used. Furthermore, no research on PDD among people seeking HIV testing was available in South Africa.

The prevalence of generalized anxiety disorder. As mentioned previously, the prevalence of GAD in the current study (3.40%) was higher than among the sample of South African adults in the SASH study, which was 1.4%. On the contrary, Olley et al. (2006) found higher GAD rates among HIV-positive individuals at both baseline (6.7%) and the six-month follow-up (6.2%) visits, compared to the current study of 3.4%. Similarly, the prevalence rate found in existing research on GAD among adults in the Western Cape, South Africa, was higher (6.0%) than that of the current study (Kleintjes et al., 2006).

The prevalence of GAD (3.4%) in the current study was consistent with the prevalence rate found among breast cancer patients in the USA (3.0%) using the SCID (Palmer et al., 2012). On the other hand, SCID diagnoses revealed an even higher rate of GAD of 30% among 288 women in the USA (Eack et al., 2008). Higher prevalence rates of GAD (14%) compared to the current study was

found among 193 adults recruited from anxiety research and treatment centres in the USA (Leyfer et al., 2006).

A possible explanation for the differences in prevalence rates may be due to the inclusion of diverse population groups of interest (i.e. general population, PLWH, specific gender groups, etc.) compared to the current population of interest (i.e. individuals seeking HIV testing). Also, no studies were found among people seeking HIV testing.

The prevalence of alcohol use disorder. Studies in South Africa found that the prevalence of alcohol use disorders (alcohol abuse and alcohol dependence) in PLWH, which ranges between 7% and 12.9%, was lower than that of the current study (19.80) (Olley et al., 2003; Freeman et al., 2007; Myer et al., 2008). Similarly, 7.8% of HIV-positive individuals in western Uganda met the diagnostic criteria for alcohol abuse (7.8%) were found among HIV-positive individuals in western Uganda (Nakimuli-Mpungu, & Munyaneza, 2011). However, higher AUD estimates (62%) were found among *shebeen* patrons in the Western Cape, South Africa, using the Alcohol Use Disorder and Associated Disabilities Interview Schedule DSV-IV Version (AUDADIS-IV) (Scott-Sheldon et al., 2014). Although the rates of AUD in the current sample were not significantly different with regard to gender, within other samples men most likely have a higher prevalence of AUD than women. For example, in a South African study among HIV-infected individuals, the rate of male alcohol dependence was 22.7%, while the rate of female alcohol dependence was 4.7% (Olley et al., 2003).

Furthermore, the prevalence of alcohol use disorder (AUD) (19.6%) among persons seeking HIV testing was comparable to the prevalence (18.2%) found among bipolar patients in a university hospital in Malaysia using the MINI (Hway et al., 2013). Results from another international study found a lower rate of alcohol dependence (10.1%) in PLWH (Sullivan et al., 2008). Research concerning the prevalence of AUDs among people seeking HIV testing was scarce in the literature.

Self-reported symptoms of psychological distress, depression, anxiety and alcohol use disorders

Reliability of the scales: The results indicated that all four scales, the HSCL-25, BDI, BAI, and AUDIT, have excellent reliability with alpha coefficients ranging from 0.89 to 0.95. Consequently, the items in each of the scales displayed excellent internal consistency. Previous studies also demonstrated high internal consistencies for these scales (Kagee, 2008; Kagee & Martin, 2010; Steele & Edwards, 2008).

Self-reported psychological distress. More than a fourth (41.20%) of the sample fell in the clinically significant range on the HSCL-25. The finding suggests that a significant percentage of the sample may have experienced clinically significant psychological distress. Similarly, in other South African studies, 38.5% of patients living with hypertension and diabetes and 52.9% of individuals receiving care for HIV scored in the elevated range on the HSCL-25 (Kagee & Martin, 2010). Likewise, Antelman et al. (2007) reported that 57% of their sample of HIV-infected individuals fell in the clinically significant range on the HSCL-25. These datasets indicate that both HIV-infected individuals and patients living with diabetes and hypertension were not significantly more distressed than those individuals seeking HIV testing.

However, only 14.2% of South African former political detainees scored above the cut-off point of 44 on the HSCL-25 (Kagee, 2005). In a study conducted by Coyne et al. (2004) among 113 female breast cancer patients, 29.2% of the sample scored above the HSCL-25 cut-off point of 44. A possible explanation for the lower rates of distress evident in the study by Coyne et al. (2004) may be because over half of the sample (52%) received psychotropic medication during the course of their treatment.

The prevalence of distress in the current sample was also higher than that found among international samples (Zabora et al., 2001; Trask; 2004; Palmer et al., 2012). For example, among newly diagnosed breast cancer patients in the USA, the prevalence of distress was 33% using the

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HSCL-25 (Palmer et al., 2012). Therefore, these rates of distress were lower than that found in the present study.

It is further assumed that there were several reasons for the high rate of psychological distress among the sample in the current study. For example, most of the individuals in the sample lived under poor socio-economic conditions, which suggests that distress may be due to poverty and other related factors such as unemployment. The distressing nature of living in poverty was in keeping with a previous study by Kagee (2005), suggesting that distress among former detainees may be due to circumstantial factors such as unemployment and a lack of social development in post-apartheid society.

Symptoms of depression. The BDI has been used in various epidemiological studies, but the present study is to my knowledge the first to use it among people seeking HIV testing. On the BDI, the average score (16.20) of the sample, which was similar to that of Kagee, Nel and Saal (2014), fell in the mild depression range. Nevertheless, 21.40% of the sample fell in the moderate to severe range on this measure, suggesting that a considerable percentage of the sample may have endured clinically significant depression. This finding was in keeping with a study by Kagee (2008) conducted among their sample of patients living with a chronic illness. Kagee (2008) indicates that 19.8% of the sample scored in or above the moderate range on the BDI. This study emphasizes that depressive symptoms are common and that these symptoms have an adverse effect on the individual's quality of life.

The reporting of high levels of depressive symptoms in South Africa and other samples were also common in the literature. For instance, Kagee and Martin (2010) indicate that among HIV-infected patients in South Africa, 37.6% of the sample fell in the moderate range on the BDI. Research with patients receiving antiretroviral treatment in South Africa by Nel and Kagee (2013) also indicates that 40.4% of the participants scored in or above the moderate to severe range on the

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BDI II. Mkize et al. (1998) report depressive symptoms of 53%, suggesting mild to moderate depression among university students who made use of clinic services on the BDI.

Even though the prevalence of depressive symptoms in this study was in keeping with other South African studies, the majority of aforementioned studies have screened HIV-infected individuals for depression, rather than HIV test seekers. Very few studies have assessed depressive symptoms prior to HIV testing. For instance, Ramirez-Avila et al. (2012) found that 55 % of their sample of people seeking HIV testing in Durban, South Africa, had depressive symptoms using a domain of the SF-36, namely the five-item Mental Health Index (MHI-5). Cholera et al. (2014) indicate that among their sample of HIV test seekers in Johannesburg, South Africa, 32 % of the study sample reported no depression; 18 % had moderate depression; 5 % had severe depression; and 1 % had very severe depression when measured using the PHQ. Furthermore, high rates of depressed mood were found among 242 women coming for HIV testing in Kwa-Zulu Natal, South Africa, using the EPDS (Rochat et al., 2006). In addition, among HIV test seekers at a Voluntary Counselling and Testing (VCT) facility in Pune, India, the rates for depression was 45% using the Hospital Anxiety and Depression scale (HADS) (Sahay et al., 2007).

The varied prevalence rates may be due to diverging measurement tools. For example, the MHI-5, PHQ, and EPDS were used to determine depression prior to an HIV diagnosis in diverse settings in South Africa and India, compared to the BDI in the current study. Even though these measurement tools were used to determine the elevated levels of depressive symptoms, different cut-off scores were utilized. Nonetheless, the diverse prevalence rates of depressive symptoms highlight that efforts are needed to combine depression and mental health screening at the time of HIV testing and diagnosis.

Symptoms of anxiety. The mean total score (12.58) of the BAI fell in the range of minimal anxiety. However, a minority (13.60%) of the sample scored in the moderate to severe range, suggesting that anxiety was definitely a concern for these individuals. The data further suggests that

for these individuals it was possible that anxiety may have been generated by the prospect of undergoing an HIV test. This finding was in keeping with those of previous studies that found elevated levels of anxiety (19.5%) among South Africans living with HIV (Kagee, Coetzee, Saal, & Nel, 2015). Furthermore, among Ghanaian undergraduate students, the mean score of the BAI was 17.6, suggesting mild to moderate anxiety (Krafona, 2014). Krafona (2014) also reported that 20.8% of his sample scored in the severe range on the BDI due to the financial pressures these students may experience to pay for accommodation, food, etc. Even among 133 adults recruited from an anxiety and treatment centre in the USA, the mean score of the BAI was 12.3 (i.e. minimal anxiety) (Leyfer, Ruberg, & Woodruff-Borden, 2005).

Conversely, higher estimates of anxiety symptoms (28.7%) were found among South African antiretroviral therapy users (Nel, & Kagee, 2013). Sahay et al. (2007) also report high rates of anxiety (62%) among VCT attendees coming for HIV testing in Pune, India using the HADS (Sahay et al., 2007). A possible explanation for these high rates might be that the South African sample included HIV-positive individuals whereas the current sample included HIV test seekers. Furthermore, the Indian sample made use of a different measuring tool, namely the HADS, whereas the current study made use of the BAI to screen for anxiety. No South African literature regarding the symptomatology of anxiety disorders among people seeking HIV testing exists.

Symptoms of alcohol use disorder. For this study, 34.60% of the sample scored at the clinically significant cut-off score of ≥8 on the AUDIT, implying hazardous or harmful drinking and possible alcohol dependence. This finding was consistent with findings from a study that reported that just under half of all participants (46.0%) fell in the clinically significant range on the AUDIT (Kader, Govender, Seedat, & Parry, 2015).

In contrast to previous studies, the prevalence of hazardous and harmful use of alcohol was much higher among PLWH in sub-Saharan Africa, where hazardous and harmful use of alcohol range between 2.6% to 24.3% (Farley et al., 2010; Yunusa, Obembe, Ibrahim, & Njoku, 2011; Do

et al., 2010; Sebit et al., 2003). In comparison with the current study, studies in South Africa have reported lower rates of alcohol abuse and dependence among PLWH, ranging from 7% to 12.9% (Olley et al., 2003; Myer et al., 2007; Freeman, Nkomo, Kafaar, & Kelly, 2007). These discrepancies can partly be explained by diverse settings. Although hazardous and harmful use of alcohol was prevalent among HIV-infected individuals, no literature among individuals seeking HIV testing was found.

Comparison of the SCID data vs the self-report data

For this study, the rates of the common mental disorders, which include major depression, persistent depressive, generalized anxiety and alcohol use disorder, rates were higher on the self-report measures than the clinical interview method. This finding was consistent with previous research (Coyne et al., 2000; Lustman et al., 2001). For example, Lustman et al. (2001) found that 11.4% of their sample had a depressive disorder using diagnostic interview methods, while 31.0% had elevated depressive symptoms using self-report instruments. Therefore, screening for CMDs prior to the receipt of an HIV test result should be considered to help inform health care providers about the risk of untreated CMDs (Halverson & Chan, 2004). As reported by Halverson and Chan (2004), the advantages of routine screening include cost-effectiveness and enhanced quality of life. A criticism on routine screening includes the over-detection of CMDs (Coyne at al., 2000), which can lead to the incorrect treatment of healthy individuals.

The performance of self-report measures in comparison to the gold standard in the context of previous studies

In addition to establishing the prevalence and symptomatology of the above-mentioned CMDs, the study examined the screening characteristics of the HSCL-25, BDI, BAI, and AUDIT with respect to the SCID interview.

The performance of the HSCL-25 in predicting depression and anxiety. For this study, the area under the curve (AUC) result of 0.85 in predicting MDD was in keeping with area under

the curve scores among other samples. For example, among HIV-positive pregnant women in Tanzania, the AUC of the total HSCL-25 in predicting MDD was 0.86 (0.86, 95%CI = 0.72-0.99) (Kaaya et al., 2002). The optimal cut-off point (51.5) on the total HSCL-25 and yielding optimal sensitivity (0.79) and specificity (0.78) was higher than the cut-off point reported among HIV-positive pregnant women in Tanzania of 1.06 (Kaaya et al., 2002). It therefore appears that the optimal cut-off point of the current study was effective at identifying non-cases of MDD and true cases of MDD among individuals seeking HIV testing.

This study also indicated that the total HSCL-25 was an adequate screening tool for diagnosing PDD with an area under the curve value of 0.82. However, results from the study performed in Eastern Afghanistan among primary care patients demonstrated an area under the curve value of 0.73 with respect to a gold standard semi-structured psychiatric interview, the Psychiatric Assessment Schedule (PAS) (Ventevogel et al., 2007). The optimal cut-off point for detecting PDD of 54.5 yielding the best sensitivity and specificity values was higher than the cut-off point of 2.0 in the study done by Ventevogel et al. (2007). Given this finding, it appears that the optimal cut-off point of 56.5 was very useful in identifying cases and non-cases of PDD among the population of interest.

Findings from the current study further indicate that the total HSCL-25 was an adequate screening tool for GAD caseness and non-caseness with an AUC of 0.87. This AUC was higher than that found among a Norwegian general population (AUC = 0.78) (Sandanger et al., 1998). Despite this difference in AUC values, both studies indicated that the total HSCL-25 has moderately high accuracy (Swets, 1988) in identifying generalized anxiety disorder. In addition, the optimal cut-off point of 54.5, which was higher than that found by Sandanger et al. (1998), resulted in acceptable sensitivity (0.77) and specificity (0.77). (1998). Nevertheless, evidence from this study and others (Sandanger et al., 1998) suggests that the optimal cut-off point was useful at distinguishing cases from non-cases of generalized anxiety disorder among HIV test seekers.

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Findings from this study further show that the total HSCL-25 yielded high negative predictive values for MDD (0.96), PDD (0.99), and GAD (0.99) and low positive predictive values when identifying MDD (0.38), PDD (0.22) and GAD (0.10). Therefore, as was also the case with other samples (Veijola et al., 2002), it appears that individuals scoring below the optimal cut-off point may indeed be regarded as true non-cases. Conversely, the low positive predictive values suggest that a high number of false positive cases may have been captured. These low positive predictive values therefore limit the effectiveness of the HSCL-25 in identifying depression and anxiety disorders in this population of interest.

In summary, the findings in the current study indicate that the total HSCL-25 may correctly be used as a screening instrument for MDD, PDD, and GAD among South African community samples, in this case individuals seeking HIV testing. However, the low positive predictive values indicated that the total HSCL-25 had difficulties with case over-identification. Therefore, those individuals who scored below the cut-off point on the total HSCL-25 may indeed be true non-cases, while those who scored above the optimal cut-off point may benefit from follow-up assessments where they undergo a diagnostic interview to establish whether they meet the diagnostic criteria for MDD, PDD and GAD. Given that the HSCL-25 cannot be used as the only method to gather diagnostic information, the HSCL-25 does appear to be sensitive in detecting individuals with MDD, PDD and GAD, and may be useful as an initial screening measure.

The performance of the subscales of the HSCL-25 in predicting depression and anxiety. The comparable area under the curve estimates for the total HSCL-25 (0.85) and the depression subscale of the HSCL-25 (0.86) suggest that both screening tools had moderately high accuracy (Swets, 1988) in detecting MDD and PDD. Correspondingly, Kaaya et al. (2002) showed that the depression subscale demonstrated a comparable accuracy to the total HSCL in identifying MDD. The optimal cut-off points for detecting major depression using the HSCL depression subscale and the total HSCL-25 were 51.5 and 32.5, respectively. Conversely, a slightly lower area under the curve value (0.74) was reported among primary care patients in Afghanistan, yielding an

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optimal cut-off point of 1.75 (sensitivity of 0.84, specificity of 0.48) (Ventevogel et al., 2007), suggesting that the depression subscale of the HSCL-25 was limited in detecting major depression. These authors argued that among Afghan primary patients, the cultural differences between men and women are vast, therefore men have a tendency to under-report mental distress (Ventevogel et al., 2007).

Even the anxiety subscale of the HSCL-25 was satisfactory in predicting GAD caseness and non-caseness (AUC = 0.88). Similarly, the anxiety subscale for males in the longitudinal Lungby study in a Swedish population yielded an AUC value of 0.85, suggesting that the anxiety subscale of the HSCL-25 may be of some use for identifying anxiety disorders (Mattison, Borgen, & Horstmann, 2013). The anxiety subscale of the HSCL-25 also performed reasonably well for men (AUC = 0.81) in primary care settings in Afghanistan compared to women (AUC = 0.65) (Ventevogel et al., 2007). These authors found that the area under curve value for their sample was 0.61 and yielded an optimal cut-off score of 2 (sensitivity of 0.75, specificity of 0.43), suggesting that the anxiety subscale of the HSCL-25 was limited in discriminating between anxiety caseness and non-caseness (Ventevogel et al., 2007). As mentioned previously, a contributing factor to this poor performance of the anxiety subscale in the Afghan primary care patients was the cultural difference between men and women as men tend to under-report mental distress (Ventevogel et al., 2007).

In summary, the depression and anxiety subscales of the HSCL-25 did not improve the prediction of depression or anxiety compared to the total HSCL-25. This is noteworthy because theoretically a cluster of symptoms should be the more crucial focus of depression and anxiety. These results were in keeping with the findings of Sandinger et al. (1998) when using the HSCL-25 against the CIDI. Furthermore, the high negative and low positive predictive values obtained using the subscales of the HSCL-25 in the present study revealed that when used in a population context, these scales miss fairly few cases of persons meeting diagnostic criteria of CMDs, but they may represent a high number of false positive cases. The findings suggest that the subscales of the

HSCL-25 can be used as a proxy in identifying depression and anxiety, but have difficulties with case over-identification. Therefore, it appears that those individuals who scored above the optimal cut-off point of the subscales of the HSCL-25 may benefit from a more extensive follow-up assessment.

The performance of the BDI in predicting depression

The screening performance of the BDI was adequate among the sample of HIV test seekers in this study. The AUC statistic of 0.77 indicated that persons who have MDD are 67.00% more likely to have an elevated total score on the BDI than those who do not have MDD. The BDI was similar to other samples in its ability to discriminate between MDD caseness and non-caseness. For example, among cardiology inpatients the BDI yielded an AUC of 0.83 (CI: 0.75; 0.89) (Forkmann et al., 2009). The Spanish version of the BDI yielded a somewhat higher AUC of 0.99 and with a cut-off point of 12/13 obtained 100% sensitivity, 99% specificity and a positive predictive value of 0.72 (Lasa et al., 2000). Viinamaki et al. (2004) found that for a diagnostic cut-off point of 14/15, the BDI was able to identify 85% of individuals who were diagnosed by the SCID accurately as having a major depressive episode. The findings suggest that the BDI was a useful screening measure in the contest of routine HIV testing to reveal which individuals need follow-up psychological assessment and possible treatment for MDD.

Furthermore, the BDI was found to be a useful screening tool in discriminating between persistent depressive disorder (PDD) caseness and non-caseness. The AUC of 0.82 indicated that persons who have PDD are 75.00% more likely to have an elevated score on the BDI than those who do not have PDD. These results were in keeping with findings by Eack et al. (2008) (AUC = 0.83). These authors also found that those persons who scored above an optimal cut-off point of 18 on the BDI, identified 88% of true cases of dysthymic disorder and over-identified 33% of assessed cases (Eack et al., 2008).

It is also important to note that those participants who scored below the optimal cut-off point of 23.3 on the BDI were accurately identified as not having PDD. The PPV of 0.20, on the other hand, indicates that the BDI was significantly less effective in predicting PDD caseness. The PPV (0.20) of the BDI suggests that individuals would need to be followed up with more intensive assessment. However, the fact that the sensitivity and the NPV were high, indicate that very few cases would go undetected using the BDI.

Given that the BDI showed good sensitivity for MDD and PDD respectively, they can be considered as possible diagnostic tools for these disorders at primary care facilities. However, the low positive predictive values suggest that it would be more appropriate to identify persons who could benefit from follow-up assessment, where they would undergo a diagnostic interview to determine whether they meet the diagnostic criteria for MDD and PDD.

Those individuals who have met the diagnostic criteria for MDD and PDD can be referred for treatment. However, it is assumed that properly trained healthcare workers are available to receive referrals. Therefore, routine screening can be recommended at the five non-government organizations (NGO'S) that formed part of this study. Routine screening may also be required for all testing sites in South Africa, not only at the above-mentioned testing sites.

The performance of the BAI

As a screening tool, the BAI performed excellently as a predictor of GAD caseness and non-caseness (AUC = 0.86). This area under the curve value was higher than that found among insomnia patients in the USA, suggesting that the BAI has moderately high accuracy (Swets, 1988) in identifying generalized anxiety disorder (Carney, Moss, Harris, Edinger, & Krystal, 2011). Carney et al. (2011), for example, found an area under the curve value of 0.71, indicating that the BAI is useful screening measure in identifying anxiety disorders. The best cut-off point that yielded optimal sensitivity (82%) and specificity (80%) values was 21.5, suggesting that the cut-off point was suitable for identifying generalized anxiety disorder cases and non-cases among HIV test

seekers. For this study, the optimal cut-off point of 21.5 was higher than the optimally efficient BAI cut-off point of 12 found by Eack et al. (2008), where sensitivity and specificity are both as high as possible (Eack et al., 2008). Eack et al. (2008) reported that at a cut-off point of 12, both sensitivity and specificity values were somewhat low. A possible reason be that the BAI under-identified 30% of the cases and over-identifying nearly 25% of these cases. Conversely, Carney at al. (2011) suggest that a BAI clinical cut-off point of 16 resulted in very low sensitivity (0.50) but acceptable specificity (0.78), indicating that the clinical cut-off point was good at identifying non-cases rather than detecting anxiety disorders among insomnia patients in the USA.

For the current study, the PPV of 13.00% indicated a high number of false positive cases (20.08%) for the optimal cut-off point of 21.5. This low positive predictive value limit the performance of the BAI in detecting GAD.

The performance of the AUDIT

As a screening instrument using an optimal cut-off point of 8.5, similar to traditional cut-off points for discriminating between AUD caseness and non-caseness, the AUDIT showed excellent sensitivity (0.81) and specificity (0.81). In addition, the negative predictive value (95.00%) in the current study was high, while the positive predictive value was fair (51.00%), indicating that few cases would be missed during screening. However, among Nigerian university students, the cut-off point of 5 and above yielded higher sensitivity (0.94), specificity (0.92), positive predictive (0.89), and negative predictive (0.95) values (Adewuya, 2005). For a study with a similar cut-off point of 8, the AUDIT had a sensitivity of 61% and a specificity of 90% for a current alcohol use disorder (Barry, & Fleming, 1993). Although a different measuring instrument was used, the findings were consistent with the results reported by Breuer et al. (2014). These authors report high sensitivity (93.8%) and specificity (85.3%) values among PLWH in South Africa using the substance abuse and mental illness symptom screener (SAMISS) against the MINI as gold standard. Therefore, the AUDIT was an excellent tool for predicting alcohol use disorders in persons seeking HIV testing.

However, the use of the AUDIT was not without challenges. The modest PPV in this study indicated that cases were over-detected by the AUDIT. Therefore, those participants who scored above the optimal cut-off point of 8.5 on the AUDIT could benefit from follow-up assessment, where they would undergo a comprehensive diagnostic interview to determine whether or not they meet the diagnostic criteria for AUD.

Summary of findings

High prevalence rates of MDD (14.4%), PDD (7.2%), GAD (3.4%), and AUD (19.6%) were found among the sample prior to the receipt of an HIV test result. It appears that the prevalence of CMDs is higher among people seeking HIV testing, compared to the general population. This may be due to the different population groups of interest included, which consisted of individuals living with HIV or seeking an HIV test result.

Evidence from this study and others (Coyne et al., 2000; Lustman et al., 2001) suggests that elevated levels of psychological distress (41.2%), moderate to severe depression (21.0%), moderate to severe anxiety (13.6%) and hazardous alcohol use (34.6%) were common among the sample. Notably, the findings demonstrate that the screening instruments yielded higher prevalence rates than the structured diagnostic interview, in this case the SCID, which is in keeping with previous research (Coyne et al., 2000; Lustman et al., 2001). A plausible explanation may be that a highly trained and expert interviewer using clinical judgement can use probes to determine whether a symptom is really present at the threshold level or not, while participants checking response options on a self-report checklist cannot. On the self-report measure, the participant usually checks the severity of the item, which is consistent with the symptom and a total score is assessed. In this case, no clinical judgement is applied.

In the settings where the present study was conducted, screening tools were sensitive enough to reflect the severity of the common mental disorder. Although the depression subscale (AUC = 0.85) and the anxiety subscale (AUC = 0.88) of the HSCL-25 were found to be able to identify

CMD caseness and non-caseness, the subscales did not improve the predictive abilities of the total HSCL. The high negative and low positive predictive values found in the present study suggest that when used in a population context, these scales miss relatively few cases of persons meeting diagnostic criteria of CMDs, but they may capture a high number of false positive cases. A possible reason for the high false positive cases may be that the specificity values are low. As reported by Sheehan and McGee (2013), a specificity value of 100% would have been ideal to circumvent false positive cases. Therefore, these scales perform well in screening and in epidemiological research. More accurate methods are needed for diagnostic purposes. For example, Eack et al. (2008) suggest a two-tiered approach. The two-tiered diagnostic approach involves screening people to identify who scored above and below the cut-off point. Those individuals who scored below the cut-off point are true non-cases. Those individuals, on the other hand, who scored above the cut-off point should be further assessed using a clinical diagnostic interview, the SCID, to determine whether they are a true case for a CMD. Subsequently, those who are considered a case may be referred for treatment (Eack et al., 2008). In the next chapter the strengths, limitations, as well as recommendations for practice and research are presented.

Chapter 6: Conclusion

Study strengths

The study has specific strengths. First, the research provides high rates of CMDs among individuals seeking HIV testing, which can guide decisions about which psychological interventions would help alleviate symptoms of CMDs.

Second, the use of the gold standard assessment in identifying CMD caseness, specifically the SCID-RV, contributes to the body of knowledge regarding HIV and mental health research, which is scarce. In addition, to my knowledge this is one of the first studies in the world utilizing the structured clinical interview for the DSM-5 (SCID-5). Previous studies made use of the structured clinical interview for the DSM-IV (SCID-4). One major change in the diagnosis of mental disorders from the DSM-IV to the DSM-5 is the combination of alcohol dependence and alcohol abuse into one disorder, namely alcohol use disorder (APA, 2013).

Third, a further contribution of the research is that participants were recruited prior to their receipt of an HIV test rather than following one. Therefore, the findings of the study provide evidence about the baseline psychiatric state of individuals seeking HIV testing.

My findings contradict the assumption that an HIV infection precipitates the development of a common mental disorder (Brandt, 2009; Freeman, 2004, Olley et al., 2003). Future research regarding psychological intervention strategies should concentrate on those individuals who were already psychologically disordered prior to an HIV-positive diagnosis. It is likely that among psychologically disordered HIV test seekers, treatment may increase their quality of life, those individuals testing positive for HIV have a better chance of adhering to ART, and engaging in positive health behaviours. Those individuals, on the other hand, who tested negative for HIV and who are already receiving treatment for their psychiatric disorder are more likely to engage in safe sex, get tested frequently, engage in health behaviours, etc. For example, research has shown that mental health treatment may decrease sexual risk behaviour and improve adherence to HIV

treatment (Safren et al., 2009; Sikkema et al., 2011). It is therefore possible that they will continue to be HIV negative if their CMD is treated.

Fifth, the subscales of the HSCL-25 may also have relevance for screening in primary healthcare contexts. The findings of the study illustrate that the depression and anxiety subscales of the HSCL-25 can successfully detect most of the cases of depression (e.g., MDD and PDD) and generalized anxiety disorder. Therefore, an important contribution of the research study is that it shows that in settings where resources are limited, the above-mentioned screening instruments may assist with the identification of those individuals in need of follow-up assessment and referrals for treatment.

Finally, those participants identified as psychiatrically disordered received a mental health referral. Even though there was a lack of a referral trajectory at the five non-medical testing sites, I was able to refer those individuals who screened positive for a CMD to nearby clinics in the surrounding areas that provide the necessary psychiatric services.

Study Limitations

Despite these strengths, the study had several limitations that deserve mention. In the context of people seeking HIV testing, the sample was selected from the Cape Metropole area of the Western Cape and the results presented may have limited generalizability to other regions in South Africa. A possible explanation may be that demographic, class, culture and linguistic factors in other provinces in South Africa may differ from those in the Western Cape, making generalization problematic.

Another limitation is that a convenience sample was used consisting of people seeking HIV testing. Thus, generalizability to other population samples in South Africa is restricted. A possible way forward could be to include a control group consisting of people not seeking HIV testing. This will facilitate much richer inferences regarding people seeking and not seeking HIV testing.

Moreover, due to few resources and time constraints, the SCID and self-report questionnaires were not translated to Afrikaans and Xhosa. Only those participants who understood English were enrolled in the research study. Although English was not their first language, most of the participants were interviewed in English only and 40 prospective non-English speaking participants were excluded from the study. A way forward could be to translate and back-translate the SCID and self-report measures into multiple languages in order to evaluate how people report behavioural and emotional symptoms.

Evidence showed that both versions of the BDI, the BDI-I and the BDI-II, have comparable reliability and convergent validity (Beck, Steer, & Ball, 1996; Steer, Clark, Beck, & Ranieri, 1999). The BDI-II is different from the BDI-I, with four items replaced to correspond with DSM-IV-related symptoms (Nuevo, Lehtinen, Reyna-Liberato, & Ayuso-Mateos, 2009). The BDI-I items, namely weight loss, distorted body image, somatic preoccupation, and inability to work, were replaced by agitation, worthlessness, difficulty concentrating and energy loss to measure the level of depression (Wang & Gorenstein, 2013). Nonetheless, the copyright of the BDI-I, retained by the American Psychological Association, is less restrictive (Beck et al., 1961), while the BDI-II has stricter copyright laws enforced by the original copyright holder, the Harcourt Assessment, controlled by Pearson Education (Wang & Gorenstein, 2013). As I was unable to procure a license for the use of the BDI-II, the BDI-I was chosen for the current study.

The interviewers for this study were highly trained and have the skills to decide whether a symptom is present or not by carefully evaluating a person's response. A highly-trained interviewer is able to elicit psychiatric symptoms more accurately than a poorly trained interviewer. It is unlikely that such training will be implemented as part of routine care in testing sites as the level of skill among the community healthcare staff to conduct psychiatric assessments is low. As such, symptoms of CMDs may not be recognized in the absence of considerable training. Future research

should focus on the training of community healthcare staff in resource-constrained settings nationwide.

It is also possible that there may have been local idioms of distress that were not integrated in the SCID and self-report measures may have relevance in improving the sensitivity and specificity for identifying true cases and non-cases of CMDs in this population. Qualitative research is needed to investigate idioms of distress among people seeking HIV testing.

Recommendations for practice. Although those individuals who screen positive for CMDs would benefit from referral to treatment, a positive screen on its own is inadequate to produce a diagnosis of a psychiatric disorder (Kagee, Tsai, Lund, & Tomlinson, 2012). Moreover, given imperfect sensitivity and specificity of screening instruments such as the HSCL-25, BDI, BAI, and AUDIT, those individuals who scored above the optimal cut-off point of the screening instruments should undergo follow-up assessments with a diagnostic interview such as the SCID to confirm the diagnosis of a CMD. Therefore, a two-tiered diagnostic approach would be more feasible. It would include both screening measures and diagnostic interviews, such as the SCID (Kagee et al., 2012; Eack et al., 2008). Screening instruments cannot be used as the only method to gather diagnostic information. However, they may be useful as the first step of this two-tiered system. Those individuals who scored below the cut-off point on the screening instruments may indeed be true non-cases. Those who scored above the optimal cut-off point should continue to the second stage where they undergo a more extensive diagnostic interview to determine caseness or non-caseness of CMDs. Related to the above, Eack et al. (2008) argue that the BDI and the BAI would be better utilized in a community setting by combining these measures with the more extensive SCID diagnostic interview in a tiered diagnostic approach. These authors recommend that the BDI and the BAI may be effective during the first step for identifying individuals in need for follow-up assessments (Eack et al., 2008). Furthermore, during the second step of the two-tiered method, the SCID could provide more extensive diagnostic data (Eack et al., 2008). Therefore, future research is

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needed that explores the applicability of this two-tiered diagnostic approach within resource-constrained South African public health facilities.

An example of the above-mentioned two-tiered method in practice would be for health professionals, such as lay counsellors and social workers, to make use of the optimal cut-off points of these screening instruments to identify individuals who could benefit from further diagnostic evaluation. The relevant modules of the SCID should be administered using all the information available (e.g., the screening instrument scores, or SCID diagnostic estimations) to reach a diagnosis (Eack et al., 2008). Other studies also making use of the tiered diagnostic approach report that, although not perfect, this method may significantly increase diagnostic precision in population settings (Shear et al., 2000; Zimmerman, 2003; Eack et al., 2008). However, a diagnosis of a psychiatric disorder is only useful if treatment is available. In resource-constrained environments in South Africa, a clear referral trajectory for psychiatric treatment may not be available (Lund, Kleintjies, Kakuma, Flisher, & MHaPP Research Program Consortium, 2010). Screening is important as it can detect psychiatric disorders early enough and provide a concise overview of symptoms (Ali, Ryan, & De Silva). Early detection is necessary as it offers a cost-effective approach to deal with mental illness early on and may consequently alleviate the strains on an already overburdened healthcare system (Ali, Ryan, & De Silva, 2016). Henceforth, studies should focus on integrating referral trajectories with routine screening and HIV testing in resource-constrained communities in South Africa.

Previous research has shown that there is an unmet need for treatment among persons diagnosed with a psychiatric disorder, in this case CMDs (Siddiqu, & Siddiqi, 2007; Lusskin et al., 2007). Lund et al. (2015) have shown that there is a large treatment gap between individuals with a CMD diagnosis in need of treatment and those already receiving treatment. A task sharing method is needed to reduce the treatment gap in LMIC (WHO, 2008). In this way, mental healthcare services are provided by community health workers who are trained and supervised by mental healthcare professionals. The possible benefits of task sharing include greater access to healthcare,

decreased stigma, and adding staff that may have a better comprehension of the local idioms of distress (Lund et al., 2015). However, this task sharing approach has limited data in terms of its usefulness in sub-Saharan Africa, specifically South Africa. Therefore, further research is needed to investigate the effectiveness of the task-sharing method in resource-limited populations in South Africa.

Although person-centred counselling was useful in alleviating psychological distress and depression among South African diabetes and hypertension patients (Kagee & Le Roux, 2009), further research should focus on more robust psychological interventions such as an altered type of cognitive behavioural therapy because it is an empirically supported treatment. For example, Safren et al. (2012) provide rather robust evidence for an adapted cognitive behavioural therapy for adherence and depression (CBT-AD), which has the ability to increase adherence to ART and decrease depression among HIV-positive individuals. Similarly, a study done by Andersen et al. (2016) investigated a nurse-delivered CBT-AD, called Ziphamandla, among HIV-positive individuals with depression who are already receiving ART's. Using a task-sharing method, the authors also found a decrease in depressive symptoms, but no significant difference in ART adherence (Andersen et al., 2016). Given the high prevalence rate of CMDs and elevated levels of distress, depression, anxiety and alcohol use among the population of interest, further research is needed for the development of cost-effective evidence-based treatments such as an adapted cognitive behavioural therapy, which focuses on improving adherence to treatment and reduces CMDs. These evidence-based treatments may be used to alleviate the symptoms of CMDs experienced by the sample in the current study.

Recommendations for research. As the prevalence rates of common mental disorders in the sample were found to be higher than those reported in the general population, risk factors associated with the high prevalence rates of common mental disorders and symptomatology need to be investigated further in a quantitative analysis. Further epidemiological research is also needed to

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determine whether the high 12-month prevalence rates of CMDs among the sample in the current study occur nationally.

Regarding the training of testing site health professionals, the sample of HIV test seekers may benefit if the healthcare professionals received the necessary training in detecting and referring those individuals who present with the symptoms of CMDs. Training of healthcare providers should therefore be a priority when conducting future research.

Based on the findings of this study, further research is required to measure the extent to which the self-report measures continue to be a valid measure of general distress or symptoms of common mental disorders in other regions of South Africa. Future research should also include assessing briefer screening instruments, such as the PHQ2 or 9 and the GAD7, among people seeking HIV testing nationwide. In addition, individuals who score above an optimal cut-off point on the HSCL-25, BDI, BAI, and AUDIT should be referred for follow-up assessments and referred for mental healthcare.

Conclusion

Despite the above-mentioned limitations, the current study nonetheless enhances our knowledge of the nature and prevalence of distress and CMDs and the usefulness of screening instruments in the Western Cape, South Africa. Within a South African context, this research is one of a few studies to determine the prevalence of CMDs among people seeking HIV testing.

Regarding limited resources, there is no integration between HIV testing and mental health, which are indicative of a fragmented healthcare system. Mental health screening during HIV testing might be useful to identify ordinarily overlooked and exceedingly common CMDs in resource-constrained settings. Although the interaction with the healthcare system may present an opportunity for the management of CMDs, limited evidence-based treatments are available while testing for HIV. However, given the high rates of distress and CMDs among persons seeking HIV testing, decisions can be made about which psychological interventions and psychiatric services are

more appropriate for improved health outcomes. Subsequently, the findings from this research that the screening instruments adequately detected CMDs in non-medical settings in the Western Cape have vital public health applicability, as those individuals who would have otherwise gone undetected were identified with a psychiatric disorder. Considering the fragmented services provided in public health facilities, since HIV testing and mental health services are available separately, it is important to integrate referral trajectories with routine screening and HIV testing. Furthermore, people seeking HIV testing is an important group, since psychological interventions implemented prior to knowledge of their HIV status may enhance their quality of life.

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Appendix A: Interview flyer

INVITATION TO PARTICIPATE IN A RESEARCH STUDY As a person seeking HIV testing, you are invited to participate in a study conducted by researchers at Stellenbosch University.

To be eligible to participate, you need to be 18 and above.

You will be asked to participate in a structured interview about your mental health and to complete a set of questionnaires.

If you are interested in learning more about the study, please ask the receptionist to introduce you to the researcher who is running the study. You will also be able to contact the researcher at: 073 740 9723

Participants will receive a token of appreciation on completion of the interview.

Appendix B: Informed consent

TITLE OF THE RESEARCH PROJECT: Common mental health problems among persons seeking HIV testing.

REFERENCE NUMBER:

PRINCIPAL INVESTIGATOR: Wylene Saal

ADDRESS: Department of Psychology, Stellenbosch University, Private Bag X1, Matieland, 7602

CONTACT NUMBER: 0737409723

You are being invited to take part in a research project. Please take some time to read the information presented here, which will explain the details of this project. Please ask the study staff any questions about any part of this project that you do not fully understand. It is very important that you clearly understand what this research entails and how you could be involved. Also, your participation is entirely voluntary and you are free to decide not to participate. If you say no, this will not affect you negatively in any way. You are also free to withdraw from the study at any point, even if you do agree to take part.

This study has been approved by the Health Research Ethics Committee at Stellenbosch University and will be conducted according to the ethical guidelines and principles of the international

Declaration of Helsinki, South African Guidelines for Good Clinical Practice and the Medical Research Council (MRC) Ethical Guidelines for Research. You have the right to be told of any new information that arises during the course of the study.

What is this research study all about?

The study will be conducted at Living Hope (Mfuleni), Masincedane (Somerset West), Reliable Action (Eersteriver), Sizophila (Nomzamo, Strand), and Phambili (Broadlands, Strand) Wellness Centres. We plan to have a total of 500 take part. The aim of the study is to understand common mental health problems among persons who are taking an HIV test and to follow them after receiving their test results over a period of one year.

Participants will be assessed for common mental disorders before they receive an HIV test. Two weeks after the HIV test, participants will be assessed again for psychological distress and then six and twelve months later. If you choose to participate in the study, your participation will be for one year.

The research results will help to identify ways to support persons who experience psychological difficulties after receiving an HIV positive test result.

Procedures

When someone comes to the clinic for an HIV test, the person will register at the clinic reception. The person will then be given a flyer informing them of the study and inviting them to meet with a researcher in a private room. If you agree to meet with the researcher you will be informed about the study in person and will be invited to participate in the study. You will be asked to complete a number of questionnaires three times over the course of one year. You will thus be contacted six months and one year after today.

Once you sign the informed consent form, you will be asked to participate in a diagnostic interview and complete some questionnaires. The diagnostic interview will be audio recorded. You will then

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be taken to the clinic nurse to receive an HIV test and will be given post-test counselling. After receipt of your HIV test result, you will again be asked to complete a questionnaire.

You will then be contacted six and twelve months later to complete a further battery of tests

Why have you been invited to participate?

You have been invited to participate in the research because you are taking an HIV test and will be receiving your test results today.

What will your responsibilities be?

At the first time point, you will be asked to participate in a clinical interview and to complete self-report questionnaires that will take approximately about an hour. At the second and third time points, six and twelve months later, you will be asked to complete set of self-report questionnaires that will take about twenty minutes.

Will you benefit from taking part in this research?

There are no direct benefits to participants for taking part in this study as it is a descriptive and not an intervention study. However, if you are identified as being psychologically distressed, you will be referred for mental health services at Mfuleni Clinic. Also, answering questions related to psychological symptoms will give you information about your psychological state. The research will help researchers understand the psychological concerns of persons who receive their test results. It may help inform future psychological interventions for persons living with HIV. If you complete the assessment today, you will receive a grocery voucher.

Are there in risks involved in your taking part in this research?

There are no major risks associated with this study as participants will only be asked to complete a paper and pencil questionnaire battery. Some participants might become distressed after receiving an HIV positive test result. They will be counselled by clinic staff. It is possible that some

participants might become distressed by completing the questionnaire battery. These participants will be referred for psychological counselling at the clinic.

If you do not agree to take part, what alternatives do you have?

If you do not take part, you will still receive HIV testing. You have the alternative not to take part in the study.

Who will have access to your medical records?

The researchers who will be conducting the study will have access to your records. The information collected will be treated as confidential and protected. If it is used in a publication or thesis, the identity of the participant will remain anonymous. Only the researchers and no one else will have access to your medical information. Member of the Research Ethics Committee may need to inspect research records.

What will happen in the unlikely event of some form injury occurring as a direct result of your taking part in this research study?

There are no injuries that could occur as a result of participation in the study. No compensation will be available to persons who injure themselves during the time of study participation.

Will you be paid to take part in this study and are there any costs involved?

No, you will not be paid to take part in the study but your transport costs will be covered for each study visit. There will be no costs involved for you, if you do take part. You will, however, receive a R50 shopping voucher as a token of gratitude for your participation in the study.

Is there anything else that you should know or do?

You can contact Prof. Ashraf Kagee at tel 0834433002 if you have any further queries or encounter any problems.

You can contact the Health Research Ethics Committee at 021-938 9207 if you have any concerns or complaints that have not been adequately addressed by your study doctor.

You will receive a copy of this information and consent form for your own records.

Declaration by participant

By signing below, I …………………………………..…………. agree to take part in a research study entitled Common mental health problems among persons seeking HIV testing.

I declare that:

I have read or had read to me this information and consent form and it is written in a language with which I am fluent and comfortable.

I have had a chance to ask questions and all my questions have been adequately answered.

I understand that taking part in this study is voluntary and I have not been pressurised to take part.

I may choose to leave the study at any time and will not be penalised or prejudiced in any way.

I may be asked to leave the study before it has finished, if the study doctor or researcher feels it is in my best interests, or if I do not follow the study plan, as agreed to.

Signed at (*place*) ....…......…………….. on (*date*) …………...……….. 2014.

……………………………   ……………………………

Signature of participant   Signature of witness

Declaration by investigator

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

I explained the information in this document to …………………………………..

I encouraged him/her to ask questions and took adequate time to answer them.

I am satisfied that he/she adequately understands all aspects of the research, as discussed above

I did/did not use an interpreter. (If an interpreter is used then the interpreter must sign the declaration below.

Signed at (*place*) ....…….......……………. on (*date*) …………....……….. 2014.

……………………………   ……………………………

Signature of investigator   Signature of witness

Declaration by interpreter

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

I assisted the investigator (*name*) ……………………………………. to explain the information in this document to (*name of participant*) ……………..…………………………….. using the language medium of Afrikaans/Xhosa.

We encouraged him/her to ask questions and took adequate time to answer them.

I conveyed a factually correct version of what was related to me.

I am satisfied that the participant fully understands the content of this informed consent document and has had all his/her question satisfactorily answered.

Signed at (*place*) ....….......…………….. on (*date*) …………....………………..

……………………………   ………………………………

Signature of investigator   Signature of witness

Appendix C: Demographic questionnaire

DEMOGRAPHIC INFORMATION

1. LAST NAME	
2. FIRST NAME	
3. AGE	

4. DATE OF BIRTH: ……/   …………………../   19…

     Day   Month Year

PLEASE INDICATE THE FOLLOWING ANSWERS BY MAKING AN (X) IN THE

APPROPRIATE BOX.

5. GENDER: ☐ Male ☐ Female

6. RACE: ☐ African ☐ Coloured ☐ White ☐ Indian

☐ Other (Please state: _____).

7. MARITAL STATUS: ☐ Single ☐ Widowed ☐ Separated

☐ Divorced ☐ Married/ living together

8. LIVING SITUATION:

☐ Live alone   ☐ Live with other adults(s), no children

☐ Live with other adults and children   ☐ Live with children

☐ Live in an institution or retirement home

9. WHAT IS THE HIGHEST EDUCATION LEVEL YOU HAVE COMPLETED?

☐ No formal education

☐ Completed primary school

☐ Attended high school but did not complete matric

☐ Completed matric

☐ Attended university, college or technikon but did not graduate

☐ Graduated from university, college or technikon

10. WHAT IS YOUR CURRENT WORK SITUATION?

☐ Employed full time   ☐ Employed part time

☐ Student   ☐ Unemployment

☐ Disabled   ☐ Homemaker

☐ Retired

11. WHICH OF THE FOLLOWING BEST DESCRIBES YOUR APPROXIMATE ANNUAL

FAMILY INCOME FROM ALL SOURCES, BEFORE TAXES?

☐ Less than R10 000   ☐ R10 001-R40 000

☐ R40 001-R80 000   ☐ R80 001-R110 000

☐ R110 001-R170 000   ☐ R170 001-R240 000

☐ R240 001 and above   ☐ Don't know

12. WHERE WERE YOU BORN?

☐ Town   ☐ City   ☐ Farm

13. WHAT IS YOUR FIRST LANGUAGE? _____

14. WHICH OTHER LANGUAGES DO YOU SPEAK? _____

Appendix D: Hopkins Symptom Checklist

Listed below are some symptoms of strain that people sometimes have. Please read each one carefully and check the answer that best reflects how much that symptom has bothered you during the **past month.**

	1= Not at all	2= A little	3= Quite a bit	4= Extremely
1.Suddenly scared for no reason	1	2	3	4
2.Feeling fearful	1	2	3	4
3.Faintness, dizziness, or weakness	1	2	3	4
4.Nervousness or shakiness inside	1	2	3	4
5.Heart pounding or racing	1	2	3	4
6.Trembling	1	2	3	4
7.Feeling tense or keyed up	1	2	3	4
8.Headaches	1	2	3	4
9.Spells of terror or panic	1	2	3	4
10.Feeling restless, can't sit down	1	2	3	4
11.Feeling low in energy – slowed down	1	2	3	4
12.Blaming yourself for things	1	2	3	4

13.Crying easily	1	2	3	4
14.Loss of sexual interest or pleasure	1	2	3	4
15.Poor appetite	1	2	3	4
16.Difficulty falling asleep or staying asleep	1	2	3	4
17.Feeling hopeless about the future	1	2	3	4
18.Feeling blue	1	2	3	4
19.Feeling lonely	1	2	3	4
20.Feeling trapped or caught	1	2	3	4
21.Worrying too much about things	1	2	3	4
22.Feeling no interest in things	1	2	3	4
23.Thoughts of ending your life	1	2	3	4
24.Feeling everything is an effort	1	2	3	4
25.Feelings of worthlessness	1	2	3	4

Appendix E: Beck Depression Inventory

Directions: On this questionnaire are groups of statements. Please read each group of statements carefully. Then pick the one statement in each group that best describes the way you have been feeling the past week, including today. Circle the number beside the statement you picked. If several statements in the group seem to apply equally well, circle each one. Be sure to read all the statements in each group before making your choice.

1.
0	I do not feel sad.
1	I feel sad.
2	I am sad all the time and I can't snap out of it.
3	I am so sad or unhappy that I can't stand it.

2.
0	I am not particularly discouraged about the future.
1	I feel discouraged about the future.
2	I feel I have nothing to look forward to.
3	I feel that the future is hopeless and that things cannot improve.

3.
0	I do not feel like a failure.
1	I feel I have failed more than the average person.
2	As I look back on my life, all I can see is a lot of failures.
3	I feel I am a complete failure as a person.

4.

0	I get as much satisfaction out of things as I used to.
1	I don't enjoy things the way I used to.
2	I don't get real satisfaction out of anything anymore.
3	I am dissatisfied or bored with everything.

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0	I don't feel particularly guilty.
1	I feel guilty a good part of the time.
2	I feel guilty most of the time.
3	I feel guilty all of the time.

6.

0	I don't feel I am being punished.
1	I feel I may be punished.
2	I expect to be punished.
3	I feel I am being punished.

7.

0	I don't feel disappointed in myself.
1	I am disappointed in myself.
2	I am disgusted in myself.
3	I hate myself.

8.

0	I don't feel I am any worse than anybody else.
1	I am critical of myself for my weakness or mistakes.
2	I blame myself for my faults.
3	I blame myself for everything.

9.

0	I don't have any thoughts of killing myself.
1	I have thoughts of killing myself but I would not carry them out.
2	I would like to kill myself.
3	I would like to kill myself if I had the chance.

10.

0	I don't cry any more than usual.
1	I cry now more than I used to.
2	I cry all the time now.
3	I used to be able to cry, but now I can't cry even though I want to.

11.

0	I am no more irritated than I ever am.
1	I get annoyed or irritated more easily than I used to.
2	I feel irritated all the time now.
3	I don't get irritated at all by the things that used to irritate me.

12.

0	I have not lost interest in other people.
1	I am less interested in other people than I used to be.
2	I have lost most of interest in other people.
3	I have lost all of my interest in other people.

13.

0	I make decisions about as well as I ever could.
1	I put off making decisions more than I used to.
2	I have greater difficulty in making decisions than before.
3	I can't make decisions at all anymore.

14.

0	I don't feel any worse than I used to.
1	I am worried that I am looking old or unattractive.
2	I feel that there are permanent changes in my appearance that make me look unattractive.
3	I believe I look ugly.

15.

0	I can work out as well as before.
1	It takes extra effort to get started at doing something.
2	I have to push myself very hard to do anything.
3	I can't do any work at all.

16.

0	I can sleep as well as usual.

1	I don't sleep as well as I used to.
2	I wake up one or two hours earlier than usual and find it hard to get back to sleep.
3	I wake up several hours earlier than I used to and cannot get back to sleep.

17.

0	I don't get any more tired than usual.
1	I get tired more easily than I used to.
2	I get tired from doing almost anything.
3	I am too tired to do anything.

18.

0	My appetite is no worse than usual.
1	My appetite is not as good as it used to be
2	My appetite is much worse now.
3	I have no appetite at all anymore.

19.

0	I haven't lost much weight, I any, lately.
1	I have lost more than 5 pounds.
2	I have lost more than 10 pounds.
3	I have lost more than 15 pounds.

20.

| 0 | I am no more worried about my health than usual. |

1	I am worried about physical problems such as aches and pains, or upset stomach, or constipation.
2	I am very worried about physical problems and it is hard to think of much else.
3	I am so worried about my physical problems that I cannot think about anything else.

21.

0	I have not noticed any recent change in my interest in sex.
1	I am less interested in sex than I used to be.
2	I am much less interested in sex now.
3	I have lost interest in sex completely.

Appendix F: Beck Anxiety Inventory

Instructions: Below is a list of common symptoms of anxiety. Please read each item in the list carefully. Indicate how often you experienced each symptom during the past week, including today, by circling the corresponding number in the column next to each symptom.

	0 = Not at all	1 = Mildly- but it didn't bother me	2 = Moderately- it wasn't pleasant at times	3 = Severely- it bothered me a lot
1.Numbness or tingling	0	1	2	3
2.Feeling hot	0	1	2	3
3.Wobbliness in legs	0	1	2	3
4.Unable to relax	0	1	2	3
5.Fear of the worst happening	0	1	2	3
6.Dizzy or lightheaded	0	1	2	3
7.Heart pounding or racing	0	1	2	3
8.Unsteady	0	1	2	3
9.Terrified	0	1	2	3
10.Nervous	0	1	2	3
11.Feelings of choking	0	1	2	3
12.Hands trembling	0	1	2	3

13.Shaky	0	1	2	3
14.Fear of losing control	0	1	2	3
15.Difficulty breathing	0	1	2	3
16.Fear of dying	0	1	2	3
17.Scared	0	1	2	3
18. Indigestion or discomfort	0	1	2	3
19.Faint	0	1	2	3
20.Face flushed	0	1	2	3
21.Sweating (not due to heat)	0	1	2	3

Appendix G: The Alcohol Use Disorder Identification Test: Self Report Version

Because alcohol use can affect your health and can interfere with certain medications and treatments, it is important that we ask some questions about your use of alcohol. Your answers will remain confidential so please be honest.

Place an X in one box that best describes your answer to each question.

	0	1	2	3	4
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
How many drinks containing alcohol do you have on a typical day when you are drinking?	1 or 2	3 or 4	5 or 6	7 to 9	10 or more
How often do you have six or more drinks on one occasion?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
How often during the last year have you found that you were not able to stop once you had started?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
How often during the last year gave you failed to do what was normally	Never	Less than monthly	Monthly	Weekly	Daily or almost daily

expected of you because of drinking?					259
How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
How often during the last year have you had a feeling of guilt or remorse after drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
How often during the last year have you been unable to remember what happened the night before because of your drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
Have you or someone else been injured because of your drinking?	No		Yes, but not in the last year		Yes, during the last year
Has a relative, friend, doctor, or other health care worker been concerned about your	No		Yes, but not in the last year		Yes, during the last year

drinking or suggested you cut down?					260
				Total	

Appendix H: Structured Clinical Interview for Major Depressive Disorder

SCID: Depressed Mood
Since (ONE MONTH AGO), has there been a period of time when you were feeling depressed or down most of the day nearly every day? (Has anyone said that you look sad, down, or depressed?) IF NO: What about feeling empty or hopeless most of the day nearly every day? IF YES TO EITHER OF ABOVE: What has that been like? How long has it lasted? (As long as 2 weeks?)
SCID: Loss of interest or Anhedonia
v   IF PREVIOUS ITEM CODED "3": During that time, did you lose interest or pleasure in things you usually enjoyed? (What has that been like? Give me some examples.) vi   IF PREVIOUS ITEM NOT CODED "3": What about a time since (ONE MONTH AGO) when you lost interest or pleasure in things you usually enjoyed? (What has that been like? Give me some examples.) vii   IF YES: Has it been nearly every day? How long has it lasted? (As long as 2 weeks?) viii IF UNKNOWN: Since (ONE MONTH AGO), during which two-week period would you say you have been doing the worst?
SCID: Weight Disturbance or Appetite Changes
During (2-WEEK PERIOD)…how has your appetite been? (What about compared to your usual appetite? Have you had to force yourself to eat? Eat [less/more] than usual? Has that been nearly every day? Have you lost or gained any weight? How much?

IF YES: Have you been trying to [lose/gain] weight?)
SCID: Sleep Disturbance
During (2-WEEK PERIOD)…how have you been sleeping? (Trouble falling asleep, waking frequently, trouble staying asleep, waking too early, OR sleeping too much? How many hours of sleep (including naps) have you been getting? How many hours of sleep did you typically get before you got (DEPRESSED/OWN WORDS)? Has it been nearly every night?)
SCID: Agitation/Retardation
During (2-WEEK PERIOD)… have you been so fidgety or restless that you were unable to sit still? What about the opposite -- talking more slowly, or moving more slowly than is normal for you, as if you're moving through molasses or mud? (Has it been so bad that other people have noticed it? What have they noticed? Has that been nearly every day?)
SCID: Fatigue/Anergia
During (2-WEEK PERIOD)…what has your energy level been like? (Tired all the time? Nearly every day?)
SCID: Worthlessness/Guilt
During this time…have you been feeling worthless? What about feeling guilty about things you have done or not done?

IF YES: What things? (Is this only because you can't take care of things since you have been sick?)   IF YES TO EITHER OF ABOVE: Nearly every day?
SCID: Concentration impaired
During (2-WEEK PERIOD)…have you had trouble thinking or concentrating?   Has it been hard to make decisions about everyday things?   (What kinds of things has it been interfering with? Nearly every day?)
SCID: Suicidal ideation
During (2-WEEK PERIOD)…have things been so bad that you thought a lot about death or that you would be better off dead?   Have you thought about taking your own life?   IF YES: Have you done something about it? (What have you done? Have you made a specific plan? Have you taken any action to prepare for it? Have you actually made a suicide attempt?)
SCID: significant distress or impairment in social, occupational, or other important areas of functioning
What effect have (DEPRESSIVE SXS) had on your life?   ASK THE FOLLOWING QUESTIONS AS NEEDED TO RATE CRITERION B: How have (DEPRESSIVE SXS) affected your relationships or your interactions with other people? (Has this caused you any problems in your relationships with your family, romantic partner or friends?)

How have (DEPRESSIVE SXS) affected your work/school? (How about your attendance at work or school? Did (DEPRESSIVE SXS) make it more difficult to do your work/schoolwork? How have (DEPRESSIVE SXS) affected the quality of your work/schoolwork?)

How have (DEPRESSIVE SXS) affected your ability to take care of things at home? How about doing simple everyday things like getting dressed, bathing, or brushing your teeth? What about doing other things that are important to you like religious activities, physical exercise, or hobbies? Have you avoided doing anything because you felt like you weren't up to it?

Have (DEPRESSIVE SXS) affected any other important part of your life?

IF DOES NOT INTERFERE WITH LIFE: How much have you been bothered or upset by having (DEPRESSIVE SXS)?

SCID: Primary Depressive Episode: The episode is not attributable to the physiological effects of a substance (e.g., a drug of abuse, medication) or to another medical condition.

Just before this began, were you physically ill?

IF YES: What did the doctor say?

Just before this began, were you using any medications?

IF YES: Any change in the amount you were using?

Just before this began, were you drinking or using any drugs?

SCID: Total number of Major Depressive Episodes

How many separate times in your life have you been (depressed/ OWN WORDS) nearly every day for at least 2 weeks and had several of the symptoms that you described, like (SXS OF WORST EPISODE)?

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SCID: Bereavement
1.   Did this begin shortly after someone close to you dies?

SCID: Postpartum depression
1.   Did the mood systems start within the 4 weeks of having a baby?

SCID: Medication or drug induced
1.   Were you taking any drugs?

Appendix I: Structured Clinical Interview for Persistent Depressive Disorder

SCID: Depressed Mood
1.   Since (TWO YEARS AGO), have you been bothered by depressed mood most of the day, more days than not? (More than half of the time?) 2.   IF YES TO ABOVE: What was that like?
SCID: Duration
How old were you when you were first bothered by depression? Do you remember the month and year?
SCID: Presence, while depressed, of two (or more) of the following:
Lose your appetite? (What about overeating?) Have trouble sleeping or sleep too much? Have little energy to do things or feel tired a lot? Feel down on yourself? ... (Feel worthless, or a failure?) Have trouble concentrating or making decisions? Feel hopeless?
SCID: During the 2-year period (1 year for children or adolescents) of the disturbance, the person has never been without the symptoms in criteria A and B for more than 2 months at a time.
What is the longest period of time, during this period of long-lasting depression, that you felt OK*?

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SCID: Age of onset of current Persistent Depressive Disorder
How old were you when you first started feeling this way (persistently depressed)? Code the following: 1- Early Onset: Onset before age 21 2- Late Onset: Onset age 21 or older
SCID: Not due to the direct physiological effects of a substance (e.g., a drug of abuse, medication) or to a general medical condition.
Just before this began, were you physically ill? IF YES: What did the doctor say? Just before this began, were you using any medication? IF YES: Any change in the amount you were using? Just before this began, were you drinking or using any street drugs?
SCID: Worthlessness/Guilt
During this time…have you been feeling worthless? What about feeling guilty about things you have done or not done? IF YES: What things? (Is this only because you can't take care of things since you have been sick?) IF YES TO EITHER OF ABOVE: Nearly every day?
SCID: Concentration impaired
During (2-WEEK PERIOD)…have you had trouble thinking or concentrating? Has it been hard to make decisions about everyday things?

(What kinds of things has it been interfering with? Nearly every day?)
SCID: The symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning
How much do your depressed feelings interfere with your life? Have you thought about taking your own life? IF DOES NOT INTERFERE WITH LIFE: How much have you been bothered or upset by having depressed feelings?

Appendix J: Structured Clinical Interview for Generalised Anxiety Disorder

Over the last several months, have you been feeling anxious and worried for a lot of the time? (Tell me about that.)
SCID: Excessive anxiety and worry
What kinds of things have you worried about? (What about your job, your health, your family members, your finances, or other smaller things like being late for appointments?) How much did you worry about [EVENTS OR ACTIVITIES]? What else have you worried about? Have you worried about [EVENTS OR ACTIVITIES] even when there was no reason? (Have you worried more than most people would in your circumstances? Has anyone else thought you worried too much?   Have you worried more than you should have given your actual circumstances?) During the last six months, since (SIX MONTHS AGO), would you say that you have been worrying more days than not?
SCID: The person finds it difficult to control the worry
When you're worrying this way, have you found that it's hard to stop yourself?
SCID: Restlessness or feeling keyed up or on edge Thinking about those periods since (SIX MONTHS AGO) when you have been feeling nervous, anxious, or worried…
…have you often felt physically restless, like you couldn't sit still?
SCID: Being easily fatigued

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…have you often tired easily?
SCID: Difficulty concentration
…have you often had trouble concentrating or has your mind often gone blank?
SCID: Irritability
1.　…have you often been irritable?
SCID: Muscle tension
1.　…have your muscles often been tense?
SCID: Sleep disturbance
…have you often had trouble falling or staying asleep? How about often feeling tired when you woke up because you didn't get a good night's sleep?
SCID: clinically significant distress or impairment in social, occupational, or other important areas of functioning.
What effect has this anxiety or worry had on your life? How have (GAD SXS) affected your relationships or your interactions with other people? (Have (GAD SXS) caused you any problems in your relationships with your family, romantic partner or friends?) How have (GAD SXS) affected your work/schoolwork? (How about your attendance at work or school? Did (GAD SXS) make it more difficult to do your work/schoolwork? How have (GAD SXS) affected the quality of your work/schoolwork?) How have (GAD SXS) affected your ability to take care of things at home?

How about doing other things that are important to you like religious activities, physical exercise, or hobbies? Have you avoided doing anything because you felt like you weren't up to it?

Has your anxiety or worry affected any other important part of your life?

IF DOES NOT INTERFERE WITH LIFE: How much have you been bothered or upset by having (GAD SXS)?

SCID: Primary Anxiety Disorder: The disturbance is not attributable to the physiological effects of a substance

F UNKNOWN: When did this anxiety begin?

Just before you began having this anxiety, were you taking any drugs, caffeine, diet pills, or other medicines?

(How much coffee, tea, or caffeinated soda do you drink a day?)

Just before these problems began, were you physically ill?

IF YES: What did the doctor say

SCID: Age at onset

How old were you when you first started having (SXS OF GAD)?

Appendix K: Structured Clinical Interview for Alcohol Use Disorders

So tell me about your alcohol use now. How much do you drink a day?

Has there ever been a time in your life when you had 5 or more drinks than intended on any occasion over the past 12 months? (apply clinical judgment here- if you think the patient is not truthful then proceed with the module

---

SCID: Alcohol use disorder

> Have you consumed alcohol in larger amounts or over a longer period of time than you intended?
> How many drinks do you have in a typical week?

SCID: Over the past 12 months…

Have you persistently wanted to or made unsuccessful efforts to control or cut down your alcohol use?

Have you spent a lot of time trying to obtain alcohol, use alcohol, or recover from its effects?

Have you experienced cravings or a strong desire or urge to use alcohol?

Has your drinking ever resulted in a failure to meet obligations at work, school, or home?

Have you continued using alcohol even though you had interpersonal problems caused by or made worse by using alcohol?

Have you ever given up social or recreational activities because of your alcohol use?

a. Have you ever used alcohol in situations in which it is physically dangerous?

b. If yes to 8a: Have you continued to use alcohol in situations in which it is physically dangerous?

a. Have you ever experienced a physical or psychological problem that was likely to have been made worse or caused by alcohol?

b If yes to 9a: Have you continued using alcohol despite knowing that it causes or makes the problem worse?

a. Have you noticed that you need more alcohol than previously to become intoxicated or create the desired effect?

b. Have you noticed that the effect that the alcohol has on you has decreased even though you drank the same amount?

a. When you stopped drinking or reduced your drinking, did you ever (as a result of this) have any of the following:

Sweating or pulse rate increase

Difficulty sleeping

Seen, felt, or heard things that were not there

Fidgetiness or restlessness

Anxiety

Seizures

b. Have you taken another substance to relieve or avoid any of these symptoms?

IF CLIENT ANSWERED YES TO E10b:

What substance did you take?

SCID: IF CLIENT ANSWERED YES TO E11b:
1.   What substance did you take?
SCID: Note to interviewer: If so, the interviewer must go back to the beginning and ask: BEFORE the last 12 months...

1. Have any of these things been true BEFORE the last 12months?

Appendix L: Referral flyer

Common mental health problems amongst persons seeking HIV testing:

Implications for mental healthcare

Should you wish to go for counselling or require any psychiatric services, these are the clinics and contact persons available for referral:

Idas Valley: Sr Chanel Nothling (psychiatric nurse) – 0218872721 or Chanel.nothling@westerncape.gov.za

Cloetesville: Sr N. Toffar (psychiatric nurse) – 021 883 2676 or ntoffar@westerncape.gov.za

Stellenbosch Provincial Hospital - 021 887 0310 (Corner Roux Rd & Merriman Street)

Vlottenburg Mobile Clinic - 021 888 5825

Appendix M: Rules for the Algorithm (Coding)

RULES FOR THE ALGORITHIM: IN ORDER TO MEET DIAGNOSIS CODING
MAJOR DERPESSIVE DISORDER In order for a diagnosis of MDD to be endorsed, the following critical criteria (A, B & C) have to be met:
Criterion A: If both A1 (depressed mood) and A2 (anhedonia) are met, then at least 3 out of 7 of the rest of the symptoms of MDD have to be met If either A1 (depressed mood) or A2 (anhedonia) are met, then at least 4 out of 7 of the rest of the symptoms of MDD have to be met

Criterion A - 5 or more out of 9 symptoms of MDD	
either depressed mood or anhedonia must be met (coded a 3 'threshold')	
Duration of at least two weeks has to be met (coded a 3 'threshold')	
Plus either 3 or 4 of the following symptoms must be met (coded a 3 'threshold').	
A3- increase or decrease in appetite	
A6- insomnia or hypersomnia nearly every day	
A9- psychomotor agitation or retardation nearly every day	
A12-fatigue or loss of energy nearly every day	
A13- feelings of worthlessness or excessive or inappropriate guilt	
A16- diminished ability to think or concentrate, or indecisiveness, nearly every day	
A19- recurrent thoughts of death	
Criterion B	
A25- The symptoms cause clinically significant distress or impairment or impairment in social, occupational, or other important areas of functioning.	

PAST MAJOR DEPRESSIVE EPISODE (PMD) The critical criteria (A, B & C) that have to be endorsed are: Criterion A: If both A52 and A53 are met, then at least 3 out of 7 of the rest of the symptoms have to be met If either A52 or A53 are met, then at least 4 out of 7 of the rest of the symptoms have to be met

Criterion A – 5 or more out of 9	
Either one of A52a (depressed mood) or A52b (feels sad or empty) has to be coded a 3	
A52c (duration of at least two weeks) has to be coded 3	
and/or	
Either one A53a (anhedonia)or A53b (loss of interest or pleasure in their lifetime) has to be coded 3	
A53c (duration of symptoms of at least two weeks) has to be coded 3	
Plus either 3 or 4 of the following symptoms	
A54– appetite	
A57– sleep difficulty	
A60 - fidgety	
A63 - energy	
A64 - worthlessness	
A67 - concentration	
A70 - Suicide	
Criterion B ("Criterion C")	
A76- The symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.	
PERSISTENT DEPRESSIVE DISORDER (PDD): (all must be coded 3) The critical criteria (A, B, C, G & H) that have to be endorsed are:	
Criterion A	
A163a- depressed mood for at least two years	
Criterion B - 2 or more out of 6 symptoms have to present in Criteria B	
A164 - appetite	
A165 - insomnia	
A166 – energy	
A167– self-esteem	

A168 - concentration	
A169 - hopelessness	
Criterion C	
A171- During the 2-year period (1 year for children or adolescents) of the disturbance, the person has never been without the symptoms in criteria A and B for more than 2 months at a time	
ALCOHOL USE	
Criterion A (at least 2 out of 11 symptoms need to be met)	
E1a- Alcohol screening asking how much a person drink a day	
E1b- 1. Alcohol is often taken in larger amounts or over a longer period than was intended.	
E2- There is a persistent desire or unsuccessful efforts to cut down or control alcohol use.	
E3- A great deal of time is spent in activities necessary to obtain alcohol, use alcohol, or recovôr from its effects	
E4- Craving, or a strong desire or urge to use alcohol	
E5- Recurrent alcohol use resulting in a failure to fulfill major role obligations at work, school, or home	
E6- Continued alcohol use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of alcohol.	
E7- Important social, occupational, or recreational activities are given up or reduced because of alcohol use.	
E8a- Recurrent alcohol use in situations in which it is physically hazardous.	
E8b- Alcohol use is continued despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by alcohol.	
E9a- A physical or psychological problem that was likely to have been made worse or caused by alcohol.	
E9b- Continued using alcohol despite knowing that it causes or makes the problem worse	
E10a- A need for markedly increased amounts of alcohol to achieve intoxication or desired effect	
E10B- A markedly diminished effect with continued use of the same amount of alcohol.	
E11a- The characteristic withdrawal syndrome for alcohol	
E11b- Alcohol (or a closely related substance, such as a benzodiazepine) is taken to relieve or avoid withdrawal symptoms	

ALCOHOL USE (recurrent)	
If any of the above are true before the last 12 months, go back to the beginning and ask: BEFORE the last 12 months	
GENERALISED ANXIETY DISORDER (GAD) (All must be coded "3"): In order to meet diagnostic criteria for Generalised Anxiety Disorder, the following critical criteria (A, B, C, D, E & F) HAVE TO BE present:	
Criterion A - F134- Excessive anxiety and worry (apprehensive expectation), occurring more days than not for at least 6 months	
Criterion B - F135- Anxiety about a number of activities *Plus* F136- The individual finds it difficult to control the worry	
Criterion F – F137- The disturbance is not better explained by another mental disorder	
Criterion C, 3 or more out of 6 symptoms	
F138- Restlessness or feeling keyed up or on edge.	
F139- Being easily fatigued	
F140- Difficulty concentrating or mind going blank	
F141- Irritability.	
F142- Muscle tension	
F143- Sleep disturbance	
Criterion D - F146b- The anxiety, worry, or physical symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning	
Criterion E - either one or both of F147a- The disturbance is not attributable to the physiological effects of a substance (e.g., a drug of abuse, a medication) or another medical condition and F147c- Physical illness	

Appendix N: Ethics Approval Letter

UNIVERSITEIT-STELLENBOSCH-UNIVERSITY
jou kennisvennoot • your knowledge partner

Ethics Letter

30-Jul-2015

Ethics Reference #: N13/05/062
Clinical Trial Reference #:
Title: Common mental disorders and psychological adjustment among individuals seeking HIV testing : Implications for mental health care

Dear Prof Shaheen Kagee,

HREC1 approved the following report pertaining to the abovementioned project:

Progress Report dated 06 July 2015

The approval of this project is extended for a further year.

Approval date: 29 July 2015

Expiry date: 29 July 2016

If you have any queries or need further assistance, please contact the HREC Office 0219399657.

Sincerely,

REC Coordinator
Franklin Weber
Health Research Ethics Committee 1

Appendix O: Ethical approval for use of additional sites

Ethics Letter

09-Dec-2014

Ethics Reference #: N13/05/062
Clinical Trial Reference #:
Title: Common mental disorders and psychological adjustment among individuals seeking HIV testing : Implications for mental health care

Dear Professor Shaheen Kagee,

Your email dated 5 December 2014 refers.

The HREC approved your request to collect data at the following additional sites:

- Reliable Action in Eersteriver

- Phambili in Strand

- Sizophela Wellness Center in Broadlands, Strand

Please provide the ethics committee with proof that these these centres have given permission for you to work there.

If you have any queries or need further assistance, please contact the HREC Office 219389156.

Sincerely,

REC Coordinator
Franklin Weber
Health Research Ethics Committee 1

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Appendix P: Reliable Action Permission Letter

Reliable Action
"Together We Can Make A Difference"

2 Andrew St.
Russell's Rest
Eerste River
7100
Cape Town, South Africa
Email: refaction@gmail.com
www.reliable-action.mozello.com
P.B.O. No: 930042331
Section 18A (1) (a)
Reg.No: 068-936 NPO
Cell: 074 964 4504

SITE PERMISSION LETTER

12 December 2014

Prof. SA Kagee
Department of Psychology
Stellenbosch University

Dear Professor Kagee

It is with great pleasure that I am writing to inform you that pending ethical clearance from your institution, I am granting you permission to collect data for your study titled "Common mental disorders and psychological adjustment among individuals seeking HIV testing: Implications for mental health care" at Reliable Action, Eerste River.

I wish you success with your project.

Yours Sincerely

Eleanor Daniels
Chief Executive Officer

Appendix Q: Sizophila Permission letter

Tel: 021 854 8311
Fax: 021 854 5305
Email: dd.mas@pixinet.co.za

Market Square
Corner of Wesley & Kort St
STRAND
7140

PO Box 1165, Strand, 7139   Website www.mascs.org.za
NPO 004 464   PBO 930001127

9 December 2014

Prof. SA Kagee
Department of Psychology
Stellenbosch University

Dear Professor Kagee

It is with great pleasure that I am writing to inform you that pending ethical clearance from your institution, I am granting you permission to collect data for your study titled "Common mental disorders and psychological adjustment among individuals seeking HIV testing: implications for mental health care" at Sizophela Wellness Centre in Lwandle/Nomzamo, Strand.

I wish you success with your project.

Yours Sincerely

ROGER ALLINGHAM
MASINCEDANE COMMUNITY SERVICE: GENERAL MANAGER

Health and Welfare Sector
Education and Training Authority
HWSETA
HWSETA ACCREDITED SERVICE PROVIDER HW591PA0904182

Appendix R: Phambili Permission Letter

PHAMBILI
Community Development
Together for Community Advancement

January 14, 2015

Prof SA Kagee
Psychology Department
University of Stellenbosch
7600

Dear Prof Kagee

Re. Request for permission to utilise our facility as HCT Site

I trust that letter found you in good shape. Well wishes for 2015. I want to express my humble apology for the delay in forwarding this letter to you.

Please accept our sincere thanks for identifying our organisation to do your much needed research in the area of HIV/AIDS. I hereby grant permission for your department to utilise our facility, Bethesda Centre, Broadlands Park, Strand, as an HCT site and also to do research on HIV/AIDS in our area.

I will also liaise with senior officials of other organisations to accommodate you in this venture. I will keep in touch with you with regards to the partnership with other organisations.

Please do not hesitate, should you require any further information in this regard.

Best Regards
Yours in community service

PASTOR COLIN VAN WYK
078 743 5096

cumlaude
languagepractitioners

Director: CME Terblanche - BA (Pol Sc), BA Hons (Eng), MA (Eng), TEFL

22 Strydom Street
Baillie Park, 2531

Tel 082 821 3083
cumlaudelanguage@gmail.com

DECLARATION OF LANGUAGE EDITING

I, Christina Maria Etrecia Terblanche, hereby declare that I edited the research study titled:

Common mental and substance use disorders among people seeking HIV testing

for **Wylene Leandri Saal** for the purpose of submission as a postgraduate study for examination. Changes were suggested and implementation was left to the discretion of the author.

Regards,

CME Terblanche

Cum Laude Language Practitioners (CC)

SATI accr nr: 1001066

Registered with PEG