PREVALENCE OF DEPRESSION AND POST TRAUMATIC STRESS DISORDER AMONG PATIENTS WITH SUBSTANCE USE DISORDERS IN REHABILITATION CENTRES IN NAIROBI AND ITS ENVIRONS

DR. JOSEPH MAKENGA MASILA
MBChB (MOI)
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DECLARATION

I declare that this work is original and has been authored by me. It has not been submitted for an academic award or qualification in any institution of higher learning. Appropriate referencing has been made when citation of other people's work has been done.

Author

Dr. Joseph Makenga Masila

Signature: _____

Date: _____

APPROVAL

This work has been brought together and reviewed under our supervision as University of Nairobi, Department of Psychiatry lecturers.

1. Dr. Lincoln Khasakhala

Senior Lecturer

Department of Psychiatry

University of Nairobi

Signature: _____

Date: _____

2. Dr. Frederick R. Owiti

MBChB (UoN), MRCPsych (London)

Senior Lecturer

Department of Psychiatry

University of Nairobi

Signature: _____

Date: _____

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I would like to appreciate the respondents in the rehabilitation centres for their cooperation during data collection.

DEDICATION

This dissertation is dedicated to my family, parents and siblings who have given me invaluable support and education opportunities.

LIST OF ABBREVIATIONS

ASSIST	Alcohol, Smoking and Substance Involvement Screening Test
AUD	Alcohol Use Disorders
BDI-II	Beck Depression Inventory-II
DALY	Disability-Adjusted Life Years
LGBT	Lesbian, Gay, Bi-sexual and Transgender
MNTRH	Mathari National Teaching & Referral Hospital
PCL-5	Posttraumatic Stress Disorder Checklist for DSM-5
PTSD	Post-traumatic stress disorder
NACADA	National Authority for the Campaign Against Alcohol and Drug Abuse
SAS	Statistical Analysis System
SPSS	Statistical Package for Social Sciences
SUD	Substance use disorder
WHO	World Health Organization
YLD	Years Lost due to Disability
YLL	Years of Life Lost

OPERATIONAL DEFINITIONS

Depression

Depression is a mental disorder whose hallmark is low mood or loss of interest / pleasure with low energy, low self-esteem or guilt feelings, distortions in appetite and sleep, poor concentration and at times anxiety for a at least two weeks

Post-traumatic stress disorder

A trauma and stressor related disorder with five symptom domains which are stressor, intrusion symptoms, avoidance, negative alterations in cognition and mood, alterations in arousal and reactivity

Substance use disorders

Substance use disorder involves taking the substance in larger amounts, wanting to cut down or stop using the substance but not managing to, spending a lot of time acquiring the substance, tolerance and development of withdrawal symptoms.

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ABSTRACT

Background: There is paucity of data whereby mental healthcare workers in rehabilitation centres diagnose co-occurring depression and post-traumatic stress disorder, which are common mental disorders among patients with Substance Use Disorders (SUDs). This failure to detect the dual diagnosis results in a more chronic course of the illnesses as there is increased rates of relapses.

Study Objectives and Setting: This study sought to determine the prevalence, severity and relationship between depression and post-traumatic stress disorder among clients with substance use disorder admitted in rehabilitation centres in Nairobi and its environs.

Methods: This was a cross-sectional study of 222 in-patients using Beck's Depression Inventory (BDI-II), posttraumatic stress Disorder Checklist for DSM-5(PCL-5) and The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) and researcher designed socio-demographic questionnaire. SPSS for windows version 24 was used for data analysis. Frequencies, proportions and Pearson's correlation was used.

Results: Prevalence of PTSD and depression was 27.5% and 34.2%, respectively. Females had higher scores of PTSD. Respondents who were divorced, separated or widowed had higher scores for both depression and PTSD. Respondents in business had higher scores for depression. There was a significant positive correlation between depression and PTSD scores and alcohol use disorder.

Conclusions: The findings of this study add some clarity to the prevalence and severity of depression and PTSD in substance use disorder patients in rehabilitation centres. PTSD and depression co-morbidities form a critical sub-group of substance use disorder patients in rehabilitation centres. Thus, correct diagnosis is essential to managing SUD patients to prevent chronic course of illness and relapses. The clinicians in rehabilitation centres should routinely screen for depression and PTSD in individuals undergoing rehabilitation. Policy makers should design protocols for integrated management of co-morbidities. More training on how to handle addiction plus co-morbidities.

Recommendations: Future researchers need to set-up longitudinal studies to assess impact of co-morbidities of depression and PTSD on rehabilitation treatment outcome. Further studies can look at the causal relation between SUD, depression and PTSD. Researchers can do a longitudinal follow up of similar population and conduct more qualitative researches in Kenya.
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CHAPTER ONE: INTRODUCTION

1.1 Background

Substance use disorders are the most disabling mental disorders causing high burden of disease and psychosocial dysfunction globally (Rehm, et al., 2014). To lower the prevalence of disease, Kenya setup the National Authority for the Campaign Against Alcohol and Drug Abuse (NACADA). It governs and guides the war against substance abuse through prohibition, making policies, conducting programs and surveys, provision of treatment centres and implementation of legislation. It is a government agency constituted by the NACADA Act of 2012 under the Ministry of Interior and Coordination. It was set-up to direct a multi-disciplinary effort targeting prohibition, monitoring and reducing substance abuse by focusing on demand reduction and supply suppression of substances in Kenya (NACADA, 2018).

NACADA, as a state agency, is cognizant of the negative impact of substance abuse on the economy and society. Therefore, it conducts programs each fiscal year to alleviate the harmful effects and promote prosperity in the economy and society thus achieving Kenya's Vision 2030. The primary stakeholders are Ministries of Health and Education, rehabilitation centres, education institutions and religious organizations (NACADA, 2018).

There are multiple rehabilitation centres in Kenya. Nairobi region has 9 rehabilitation centres, Central 24, Eastern 3 and 16 in Rift Valley region. Rehabilitation centres provide detoxification, maintenance therapy and psychotherapy as treatment services. The effective period of treatment has been set-up to be 90days or longer (NACADA, 2018).

Unfortunately, Kuria et al (2012) has shown that there is a high rate of relapse into alcohol use. The study further indicated that the rate of depression was high as an associated disease in those patients which remained undetected (Kuria, et al., 2012).

Depression, post-traumatic stress disorder (PTSD) and suicidality are major comorbidities with alcohol and substance dependence. In addition, drinking at an early age and growing use of substances is common in these comorbidities (Neupane, Bramness, & Lien, 2017). This is supported by studies among Lesbian, Gay, Bi-sexual and Transgender (LGBT) populations where a significant association occurred among substance use disorder (SUD), depression and PTSD (Smith, Armelie, Boarts, Brazil, & Delahanty, 2016). Further studies on the linkage, gender differences and associations between depression and alcohol use disorder (AUD) have been recommended by researchers (Boden & Fergusson, 2011).

The occurrence of one or more disorders concurrent with a primary illness is known as dual diagnosis or comorbidity. Most notably, SUD co-occurrence with psychiatric disorder is a cause for concern among health practitioners due to treatment and rehabilitation (Brown, Stout, & Gannon-Rowley, 1998). The coexistence of PTSD and depression with SUD is reported to be very common (35-50%) (Reynolds, et al., 2005). More often, a positive correlation exists which negatively impacts treatment and rehabilitation. Unfortunately, frequent assessment and comprehensive treatment of co-occurring disorders is not performed in rehabilitation centres (Darghouth, Nakash, Miller, & Alegría, 2012).

Depression is a psychiatric illness whose symptom of low mood is a hallmark (Reynolds & Kamphaus, 2013). Depression is characterized by low mood, lack of interest, changes in weight or appetite, impaired memory, poor concentration, reduced energy, hopelessness, guilt and suicidality. A diagnosis is made when five or more features are present for at least two weeks (APA, 2013).

PTSD is a psychiatric illness that results from encountering trauma directly or indirectly through accident, sexual assault or demise (Edition, Mason, Rowlands, Edition, & Ford, 2013). It is characterized by avoidance, intrusion symptoms, stressor, negative changes in mood, reactivity and arousal. A diagnosis is made when one avoidance, one intrusion symptom, one stressor and two negative changes in cognition occur for more than one month which impairs functioning and all other causes are excluded (APA, 2013).

SUD is characterized by an individual having a strong urge to use, consuming huge amount of the substance, impaired control while using, ongoing use despite problems caused, not meeting responsibilities, needing more and more amounts and developing adverse effects on reducing use. A diagnosis is made when two or more symptoms occur within the same 12-month period (APA, 2013).

1.2 Problem Statement

The accuracy with which mental healthcare professionals diagnose co-occurring disorders is a big challenge. In the United States, it has been shown that there are inconsistencies in the assessment of co-occurring disorders. This inaccuracy leads to worsening progression of the diseases, symptomatology and more disability (Darghouth, Nakash, Miller, & Alegría, 2012). PTSD and SUDs is a commonly occurring dual

diagnosis (Ouimette, Brown, & Najavits, 1998). In the general population, an estimated 2.7 million were affected by depression and SUDs (Office of Applied Studies, 2007). PTSD and depression are therefore the major comorbidities in substance use disorders affecting treatment outcomes in inpatient rehabilitation centres.

Subsequently, treatment of these major comorbidities mainly depends on the accurate diagnosis and the severity. Failure to detect the dual diagnosis results in a more chronic course of the illnesses. Determination of the severity will lead to better outcomes of the rehabilitation process. This will increase the treatment rates and better outcomes (Dore, Mills, Murray, Teesson, & Farrugia, 2012). However, there is paucity of epidemiological data to assess comorbid disorders among patients with SUDs in Kenyan rehabilitation centres. The aim of this study was to examine the prevalence, severity and comorbidity of PTSD and depression in Kenyan patients admitted for rehabilitation for SUDs.

CHAPTER TWO: LITERATURE REVIEW

2.1 Overview

This chapter focused on the theoretical framework of the study, literature review and developed the conceptual framework.

2.2 Trans Theoretical framework

The theory was developed by Prochaska and DiClemente. It's aimed at how a person makes decisions concerning alteration and commitment to their health patterns. As illustrated in table 2.1 and figure 2.1, the theory posits that individuals move across 6 stages: Precontemplation, contemplation, determination, action, maintenance and relapse (Prochaska & DiClemente, 1982). For each stage, different strategies are applied to progress and involve:

1. Pre-contemplation - Not ready to take action where the affected individual typically denies having problems with the substances of addiction they are using. This picks resistance to change.

2. Contemplation - Recognizing behaviour is problematic where the individual begins to consider altering their substance use. There is hesitancy implying the individual is considering to change their substance use involvement but not yet committed to the change.

3. Determination or preparation - Intending to take action. The person is willing and devoted to halt the harmful activity but there still exists ambivalence as the change needed is not fully resolved as the individual requires to act so as to initiate the change.

4. Action - Modifying problem behavior. The person develops a plan and publicly states the intent to stop harmful behaviour. He/she will require social support to succeed. The duration varies with problem severity.

5. Maintenance - Sustaining the new changed behavior, which requires time with a thread of returning back to the old problematic behavior; back to stage one or two.

6. Relapse or recycling - a zero temptation, where this occurs frequently in SUDs. Relapse may occur due to: -

   - Sudden cravings or lures

   - Individuals not wary of substance use pit falls

   - Being overconfident about resisting temptation

   - Undiagnosed and untreated coexisting depression and PTSD
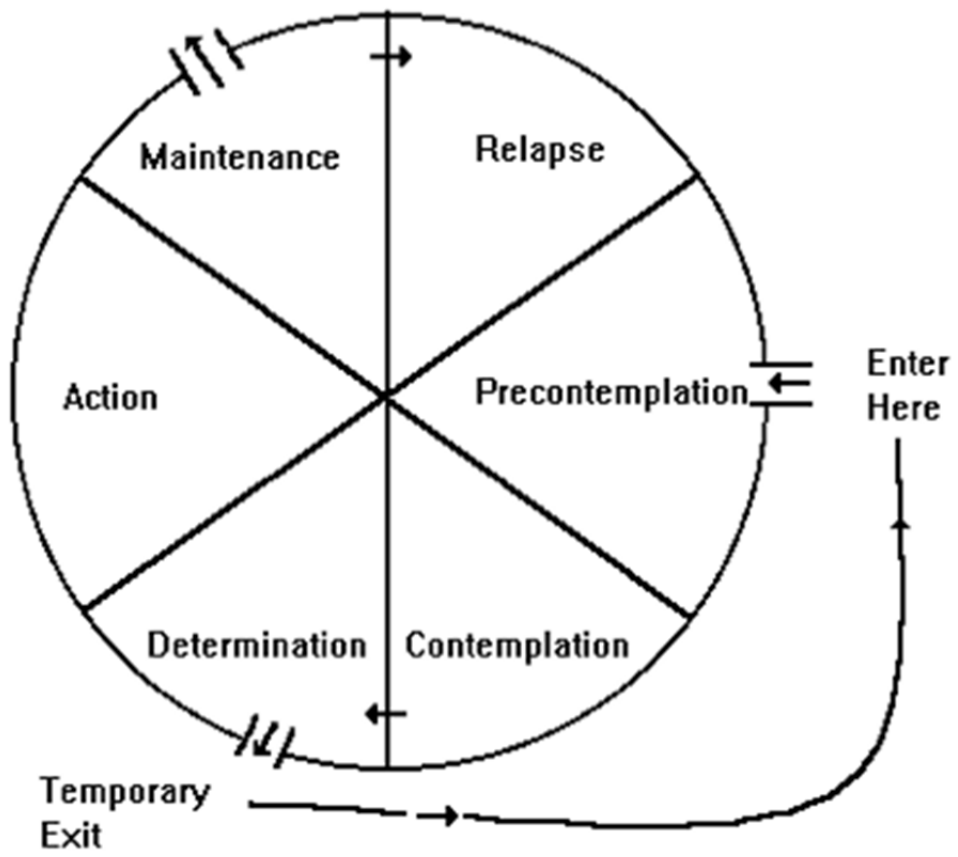
Figure 2.1 Stages of change (Prochaska & DiClemente, 1982)

Table 2.1

Processes of change

Pre-contemplation	Contemplation	Preparation	Action	Maintenance
Consciousness raising				
Dramatic relief				
Environmental reevaluation				
	Self-reevaluation			
		Self-liberation		
			Contingency management	
			Helping	
			relationship	
			Counterconditio	
			ning	
			Stimulus	
			control	

Source: (Prochaska & DiClemente, 1982)

2.3 Prevalence and severity of PTSD in substance use disorder

In psychiatric disorders, rates of mortality are greatest in SUDs with AUDs being 5 times higher (Chesney, Goodwin, & Fazel, 2014). In 2015, the World Health Organization (WHO) estimated that the Crude Death Rate (CDR) due to alcohol use disorders (AUDs) in Africa and globally was 1.2 and 1.8, respectively. AUDs resulted in 9% of deaths in Africa. Disability-Adjusted Life Years (DALY) from AUDs was 8%, Years of Life Lost (YLL) was 38% and Years Lost due to Disability (YLD) was 5% globally. In Africa, DALY was 10% due to AUDs (WHO, 2017). Male participants had

high DALY at 47% between the ages 30-49 years while females had 42% within the same age group. Male respondents had a high YLL at 46% between the ages 30-49 while females had 40% within the same age group. Kenya had a total DALY of 0.2% due to AUDs (WHO, 2017).

In the general population, PTSD is estimated to affect 6%-8% and is worsened by dual diagnosis with SUD (Pietrzak, Goldstein, Southwick, & Grant, 2011). PTSD and SUDs is a commonly occurring dual diagnosis. The prevalence is estimated at 50% of inpatient populations (Ouimette, Brown, & Najavits, 1998). Another study found a rate of 43% in inpatient populations and 62% in pregnant women in inpatient treatment for SUDs (Jacobsen, Southwick, & Kosten, 2001). In the US, this dual diagnosis has been reported to occur at a rate of 46.4% (Pietrzak, Goldstein, Southwick, & Grant, 2011). In Cyprus, among Cypriot therapeutic communities for substance use, a cross-sectional study reported 40.6% co-occurrence rates (Papastavrou, Farmakas, Karayiannis, & Kotrotsiou, 2011).

Posttraumatic stress disorder has multiple symptom domains ranging from arousal to symptoms of central nervous depressant withdrawal. The arousal symptoms include poor concentration, disturbed sleep, high alertness, easily angered and startled. The symptoms of central nervous depressant withdrawal are insomnolence, purposeless movements, panic attacks, involuntary hand shaking, momentary delusions and convulsions (Jacobsen, Southwick, & Kosten, 2001).

In Australia, nearly 80% of SUD patients encountered one traumatic event. In contrast, only 45% screened positive for current PTSD symptoms. The first traumatic event was encountered at a mean age of 14 years. The ratio of women to men for rape was 9:1 while

sexual molestation was 5:1. However, the patients had high retention rates in the rehabilitation centres (Dore, Mills, Murray, Teesson, & Farrugia, 2012).

PTSD in an individual with SUD is associated with poor prognosis, increased rate of relapse and readmission, increased drug use and poor occupational functioning (Mills, 2008). This was supported by Ouimette et al (1998) who reported this comorbidity resulted in worsening of PTSD symptomatology and greater risk of relapse (Ouimette, Brown, & Najavits, 1998). Interestingly, there are increased depressive symptoms in PTSD/SUD comorbidity (Blanco, et al., 2013).

An increased rate of trauma occurring in childhood and worsening psychological health has been reported in this dual diagnosis (Evren, et al., 2011). Moreover, early onset of drinking problems has been reported (Driessen, et al., 2008). These negative symptoms result in reduced quality of life (Riggs, Rukstalis, Volpicelli, Kalmanson, & Foa, 2003). A positive correlation between SUD and PTSD has been found which worsens the course of illness (Bremner, Southwick, Darnell, & Charney, 1996). In South Africa, significantly increased odds for PTSD especially with cannabis and alcohol use disorders was established (Saban, et al., 2014).

2.4 Prevalence and severity of depression in substance use disorder

A survey by WHO estimated that 5.7% of the population had depression which resulted in an annual mean of 34 days of absenteeism (Alonso, et al., 2011). In 2010, the DALY and YLD of depression was 40.5% and 42.5%, respectively (Whiteford, et al., 2013). In 2015, this burden of DALY and YLD decreased to 32% and 35%, respectively (WHO, 2017).

An analysis of a systematic research on coexisting depression and SUD found a positive correlation, an increased association with suicidality and a prevalence close to 33% (Davis, Uezato, Newell, & Frazier, 2008). Depression has been reported to increase the urge for use of alcohol and treatment of the same, if prompt evaluation is done, improves the overall rehabilitation outcomes (Kuria, et al., 2012). SUD comes second to depression as the main causes of suicidal ideations and attempts. Co-occurrence with either or both of depression and/or PTSD increases the occurrence of such behavior (Centre for Suicide Prevention, 2014).

A study carried out in Australia found nearly 20% of SUD patients had moderate to severe depression. Among the SUD patients, 37% had self-injurious behavior or suicidal attempts (Dore, Mills, Murray, Teesson, & Farrugia, 2012). In Oregon, U.S, participants between the ages of 24-30 years had 10% rate of comorbidity of depression and AUD while ages 30 and above had 7%. Cumulatively, the dual diagnosis occurred in 21% of the participants (Brière, Rohde, Seeley, Klein, & Lewinsohn, 2014).

In New Zealand, a quarter of a decade longitudinal study reported this dual diagnosis had a positive correlation where AUD increased the rate of major depressive disorder (Fergusson, Boden, & Horwood, 2009). Another longitudinal study in New York, U.S, determined the relationship between onset of substance use and development of mental illnesses. Onset of alcohol use in childhood, adolescence and early 20s was associated with development of depression in late 20s (Brook, Brook, Zhang, Cohen, & Whiteman, 2002). This was supported by Hasin and Grant (2002) who reported that prior alcohol dependence had a strong positive association with major depression and quadrupled the risk (Hasin & Grant, 2002).

In South Africa, the lifetime prevalence of comorbidity of SUD and depression was 8.6%. Alcohol users were highly likely to be males, employed and living in urban regions (Saban, et al., 2014). In the premier psychiatric hospital in Kenya, Ndetei et al (2008) conducted an epidemiological study and reported that a positive correlation existed between alcohol dependence and SUD (Ndetei, et al., 2008). Further studies were done by Kuria et al (2012) who found the rate of moderate and severe depression in SUD patients was 63.8% at intake and after completion of rehabilitation was 30.2% (Kuria, et al., 2012).

Treatment outcomes in inpatient rehabilitation centers are greatly affected by comorbidities and in particular, rate of suicide attempt at 37% (Dore, Mills, Murray, Teesson, & Farrugia, 2012).

2.5 Sociodemographic correlates and associations

Comorbidity of non-SUD psychiatric diagnosis and SUD is common (Kingston, Marel, & Mills, 2017). A 2005 to 2006 Barcelona based study among SUD patients determined that psychiatric diagnosis is prevalent among SUDs and revealed gender differences among specific substance use disorders. This study recommended gender specific integrated interventions in SUD treatment (Frem, Torrens, Domingo-Salvany, & Gilchrist, 2017). Further, a ten million Statistical Analysis System (SAS) based analysis in new south Wales focused on the dual diagnosis. Among SUD diagnosis there was a 42-57% presence of a secondary non-SUD psychiatric diagnosis, while a 9-12% presence of SUD was reported in those with a primary psychiatric non-SUD illness. The odds ratio for either SUD or non-SUD diagnosis in comparison to general population was ranging from 13.0 to 20.8 (Lai & Sitharthan, 2012).

Despite SUDs rates being greater in males than females, the dual diagnosis phenomenon is two times more among females (Torrens, et al., 2011). Mood and anxiety disorders (inclusive of PTSD) are prevalent comorbidities in SUDs. Notably, more common among females (Frem, Torrens, Domingo-Salvany, & Gilchrist, 2017). The concept of dual diagnosis and the presence of sex differences was supported by a Spanish study that found high female comorbidity rates (Farré, Tirado-Muñoz, & Torrens, 2017). In the older participants, age was a moderating variable (Conner, Pinquart, & Gamble, 2009).

A regional cross-sectional study covering Italy, Poland, Catalonia, Austria and Poland among women who inject drugs on psychiatric co-occurrence and domestic violence found depression, PTSD and panic disorders to be prevalent at rates of 76%, 52% and 54%, respectively (Tirado-Muñoz, et al., 2018). In Maryland, USA, the rates of depression and PTSD were found to be 25% and 14% among inpatients in a therapeutic community. Both axis 1 of DSM-IV diagnoses were more common in women. The most common substances in dual diagnosis were alcohol and cannabis at 76% each (Chen, et al., 2011). Gender, marital status, traditional gender roles, occupation and education level were reported to be major associations (Saban, et al., 2014).

2.6 Study Justification

PTSD and depression are the major comorbidities in substance use disorders affecting treatment outcomes in inpatient rehabilitation centers. Local studies in Kenya have not studied comorbidities among the important inpatient population. The available studies on depression as a comorbidity were done on outpatients. There is paucity of epidemiological data to assess comorbid disorders among patients with SUDs in Kenyan rehabilitation centres. The aim of this study was to examine the prevalence, severity and comorbidity of PTSD and depression in Kenyan patients admitted for rehabilitation for SUDs. The current study was therefore justified to fill in the gap and describe the rates and severity of the co-occurrence.

2.7 Study Significance

This study will help mental healthcare professionals to increase the accuracy of detection of co-occurring PTSD and depression in SUDs. This study will also aid the Ministry of Health and NACADA in the development of appropriate treatment strategies. Moreover, this study will add to the body of knowledge on prevalence of depression and PTSD in SUD patients in rehabilitation centres in Nairobi. Further studies can be done to determine the causal relationship of the comorbidities locally.

2.8 Study Questions

1. What is the severity of substance use among patients in rehabilitation centres with substance use disorders in Nairobi and its environs?

2. What is the estimated prevalence and severity of depression among substance use disorder patients in rehabilitation centers in Nairobi and its environs?

3. What is the prevalence and severity of PTSD among substance use disorder patients in rehabilitation centers in Nairobi and its environs?

4. Is there an association between depression and PTSD among patients in rehabilitation centres with substance use disorders in Nairobi and its environs?

2.9 Study Objectives

2.9.1 Broad objective

To determine the prevalence, severity and association of depression and PTSD among substance use disorder patients in rehabilitation centers in Nairobi and its environs.

2.9.2 Specific Objectives

1. To assess the severity of substance use among patients in rehabilitation centres with substance use disorders in Nairobi and its environs.

2. To determine the prevalence and severity of depression among substance use disorder patients in rehabilitation centers in Nairobi and its environs.

3. To determine the prevalence and severity of PTSD among substance use disorder patients in rehabilitation centers in Nairobi and its environs.

4. To assess the association between depression and PTSD among substance use disorder patients in rehabilitation centers in Nairobi and its environs.

2.10 Conceptual Framework

The framework depicted a direct relationship between independent and dependent variables as a causal relation. The effect modifiers and confounders will modify the outcome.

Effect modifiers

Age
Gender
Educational level

Independent variable

Substance use
disorder

Dependent variable

PTSD
Depressive disorder

Confounders

Family history of substance use
Marital status
Employment status
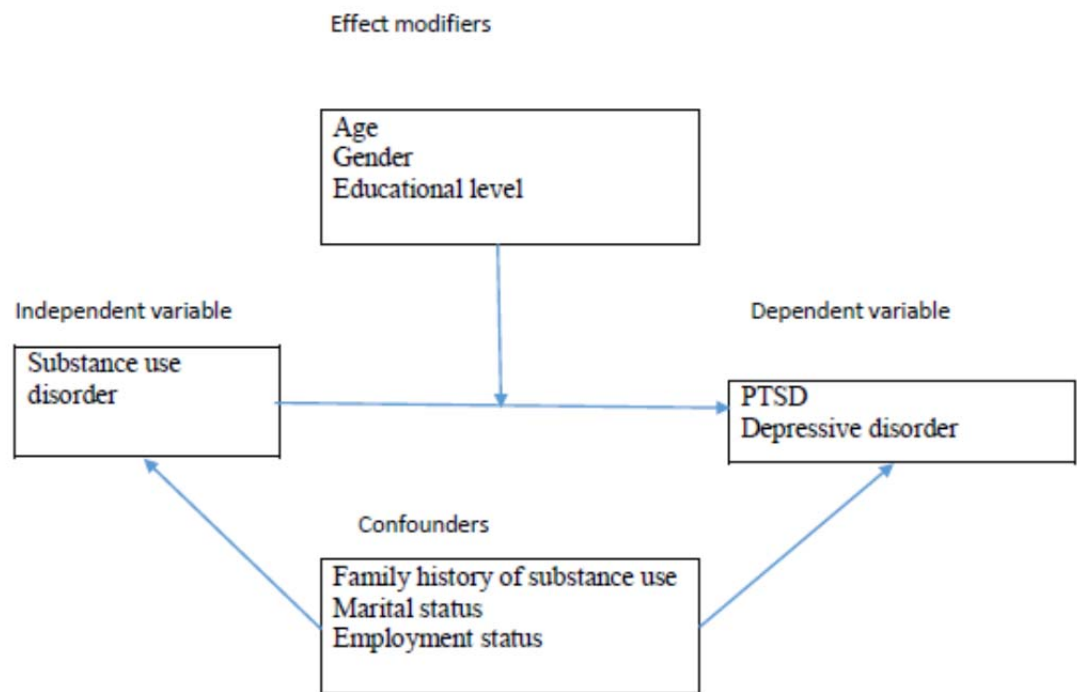
Figure 2.2 Conceptual framework   Source: Researcher (2019)

CHAPTER THREE: METHODOLOGY

3.1 Study Design

This study used a cross sectional analytical study design applying a quantitative data collection method to determine the extent of relationships between: the independent variable, substance use disorder and the dependent variables; depression & PTSD.

3.2 Study Area Description

The study was carried out in rehabilitation centers in Nairobi and its environs. The rehabilitation centres were selected within a 50km radius of Mathari National Teaching & Referral Hospital. Google maps was used to determine the distance. The rehabilitation centres included MNTRH (Mathari National Teaching and Referral Hospital), Brightside Treatment & Rehabilitation Centre in Lower Kabete and Kitisuru, Precision Counselling Home, New-Life Rehabilitation Counselling Centre, Springs of Hope Rehabilitation Centre, Bustani Treatment Centre, Sober Living & Recovery Centre, Oasis of Hope, Blessed Talbot, Life Wellness Centre, Care-tech Medical & Rehabilitation Centre, Wonder Peace Rehabilitation Centre, The Bridge Centre Ridgeways and Teens Challenge Ridgeways, New life Mwangaza Rehabilitation centre Katani Machakos, New Dawn rehabilitation centre-Rongai, Fountain of Hope Mavoko, Retreat Ngong-annex, Karira Miracle Rehabilitation Centre-Kiserian, SAPTA Githurai 44, Mariakani villa South C, Asumbi Treatment centre-Langata, Nairobi Addiction Treatment and specialized medical centre, Life Bridge Psychiatric Hospital and Rehabilitation Centre and Mediva Wellness Centre. The rehabilitation centres were of two types which include out-patients and in-patients.

3.3 Study Population

The study population was all substance use disorder patients undergoing treatment in rehabilitation centers. MNTRH rehabilitation centre had an average of 40 inpatients monthly. Precision Counselling Home had an average of 15 monthly, Brightside 20, New-Life 15, Springs of Hope 20, Bustani Treatment Centre 25, Sober Living 20, Oasis of Hope 20, Blessed Talbot 23, Life Wellness 22, Care-tech Medical 19, Wonder Peace 20, The Bridge 23, Teens Challenge 25, Katani 10, Miracle Rehabilitation Centre 10, Mariakani Villa 17, Nairobi Addiction Treatment & Specialised Medical Centre 20, SAPTA Githurai 10, Mediva Wellness 7, New Life Mwangaza 15, Asumbi Langata 20, New dawn 10, Fountain of Hope 15 and Life Bridge Psychiatric Hospital and Rehabilitation Centre 10. Total population was 451. The rehabilitation centres with outpatients were excluded from the study.

3.4 Sample size determination

The study used the Yamane formula to calculate the sample size (Yamane, 1967).

Formula: $n = N/1 + N (e^2)$

Where n=sample size, N=Total population, e=precision level

Therefore, n= 451/1+451(0.05*0.05)

n=211.986

n was rounded off to the nearest even number=212

The minimum required sample size was 212. However, allowing for 10% attrition for non-response, the sample size was adjusted upwards to 233.

3.5 Sampling Procedure

Each rehabilitation centre within the 50 KM radius was listed according to the year of registration and for every odd number and even number a coin was tossed to determine which rehabilitation was studied. All tails were studied. Out of the 25 centres, 13 were picked. This sampling method enabled practicality while maintaining accuracy and having a representative sample of the study area. This also allowed for our target sample of 233 to be achieved while maintaining accuracy. The 233 participants were picked through a census of all in-patients in the rehabilitation centres until the study achieved sample saturation. Purposive sampling method was used. Study respondents were recruited from rehabilitation centres in Nairobi and its environs. Study respondent were recruited consecutively over a period of 10 weeks. Invitation and screening for exclusion criteria in order to determine suitability for the study was done. Only in-patients who had been on treatment for not less than 2 weeks were interviewed. This included informed consent in the presence of a care giver and a counsellor at the rehabilitation centre to ensure the selected respondents were under their care for rehabilitation.

Mental status was conducted on all potential respondents. Mental state examination was conducted prior to signing informed consent. This was to further ensure patients were stable without a severe psychiatric disorder that could interfere with the cognitive processes when filling out the questionnaires. The absence of any severe psychopathology that would have undermined the capacity to give informed consent and since the present study was focused on substance use disorder patients with positive

clinical findings was an indication that therapeutic alliances were established on all respondents.

Therefore, those with positive clinical findings on mental state examination were counseled and referred for further intervention by their primary treating medical practitioner.

3.6 Inclusion and Exclusion Criteria

The inclusion criteria were (1) the inpatients undergoing treatment in rehabilitation centres (2) respondents between the ages 18-65 years old; (3) substance use within 90 days before study recruitment (4) the patient must have been on treatment in the rehabilitation centre for at least 2 weeks and (5) stabilization on psychotropic medication at least 2 weeks prior to study recruitment.

The exclusion criteria were (1) inpatients who refused to consent to the study (2) active-phase psychotic and mood symptoms (3) outpatients receiving treatment at rehabilitation centres. A total of 18 respondents were excluded. Ten of the excluded respondents had acute mania, three had severe depression, three had mutism and two had extreme anhedoina.

3.7 Study Variables and Instruments

Study respondents with no positive finding on mental state examination were allowed to proceed and sign informed consent attached in **Appendix I** and **II (Swahili version)**. Those who signed the informed consent were asked to voluntarily participate and fill the research instruments: modified ASSIST, Becks Depression Inventory (BDI-II), Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5). The researcher designed a socio-demographic questionnaire attached in **Appendix III** and **IV (Swahili version)**.

The independent variable was SUD where the severity of each substance was measured by the modified ASSIST. The dependent variables were depression and PTSD which were measured through questions administered in the Beck's Depression Inventory (BDI-II) and Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5), respectively. The confounders were age, sex, and education level and employment status.

Substance use disorder severity was measured using the modified ASSIST developed by WHO. It is an adequately reliable measure of substance use with a Cronbach's alpha of above 0.80 (Humeniuk, Ali, & WHO, 2006). In Kenya, it has been used in Kangemi (Kuria, et al., 2012). The modified ASSIST questionnaire is attached in **Appendix V.**

Depression was measured by the Becks Depression Inventory (BDI-II). Developed in 1961, it is a self-report instrument consisting of 21 items measuring the severity of depression (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). It was revised in 1996 by to reflect changes in the DSM IV (Beck, Steer, & Brown, 1996). The BDI-II is attached in **Appendix VI** and **VII (Swahili version)**. A systematic review of 118 articles investigating psychometric properties reported the BDI-II had an alpha coefficient ranging 0.83-0.96. Each item was evaluated on 4-point Likert scale where 0 was Symptom Not Present to 3 was Symptom Strongly Presents totaling to 63. The recall period was the past week. A score of 0-13=minimal depression, 14-19=mild depression, 20-28=moderate depression and 29-63=severe depression (Wang & Gorenstein, 2013).

BDI-II has been used in Kenya by Muriungi and Ndetei (2013) at a Kenya Medical Training College to assess depression in the students (Muriungi & Ndetei, 2013). It has also been used in Nyanza province to test depression in HIV positive individuals (Aboge, Obondo, Kathuku, & Kibuule, 2015).

PTSD was measured using the Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5). It is a 20-item self-report instrument that measures the severity of PTSD. It has shown excellent reliability of Cronbach's alpha 0.92 in a study in Zimbabwe (Verhey, Chibanda, Gibson, Brakarsh, & Seedat, 2018). The PCL-5 is attached in Appendix **VIII** and **IX (Swahili version)**.

3.8 Data Collection Procedures

Study respondents were recruited from rehabilitation centres in Nairobi and its environs over a ten week period. Invitation and screening for exclusion criteria in order to determine suitability for the study was done. Only in-patients who had been on treatment for not less than 2 weeks were interviewed. This included informed consent in the presence of a care giver and a counsellor at the rehabilitation centre to ensure the selected respondents were under their care for rehabilitation.

Mental status was conducted on all potential respondents. Mental state examination was conducted prior to signing informed consent. This was to further ensure patients were stable without a severe psychiatric disorder that could interfere with the cognitive processes while filling out the questionnaires. The absence of any severe psychopathology that would have undermined the capacity to give informed consent and that this present study focused on substance use disorder patients with positive clinical findings was an indication that therapeutic alliances were achieved on all respondents.

Therefore, those with positive clinical findings on mental state examination were counseled and referred for further intervention by their primary treating medical practitioner. Data was collected from four questionnaires: researcher designed socio-demographic questionnaire, modified ASSIST, BDI-II and PSCL-5. It involved searching

for respondents who met the inclusion criteria and administering the questionnaires. Respondents were assessed for severity of SUD with comorbid depression and PTSD. The questionnaires were filled by the respondents with help of the principal investigator.

3.9 Recruitment and data collection flow chart

8. Researcher thanked the participants and exited

1. Entered the rehabilitation centre

2. Introduced and explained purpose of study to caregiver/counseller at rehabilitation

3. Accessed the patient register book to retrieve IP numbers for patients on treatment for > 2 weeks

4. Screened for inclusion criteria
• Excluded those who did not meet inclusion criteria

5. Informed consent given in presence of caregiver/counsellor to ensure selected respondents are under their care

6. Mental status exam conducted
• Excluded, counselled and referred those with positive clinical findings

7. Administered the questionnaires to selected respondents

Figure 3.1 Data collection flow chart

3.10 Quality Assurance Procedures

The researcher was trained on human subject research ethics and the application of all research tools used in this study by supervisors. Emphasis was placed on ensuring

study respondents fully understood the questions asked and questionnaires were accurately completed. There was no audio taping or photographing of the patients.

Mental state examination was performed to ensure respondents had insight and to rule out possible delusions that would alter the quality of results. Data entry followed a double entry procedure in order to minimize error. At the end of each interview session, the principal investigator inspected the filled questionnaire for completeness and validity of responses prior to storing them safely in preparation for analysis.

3.11 Data management

Data entry was done using SPSS for windows version 24 and stored into a password protected database. The questionnaires used for data collection were locked in a cabinet with access controlled by the principal investigator. Data entered in SPSS was protected with password to which only the principal investigator was privy. Each questionnaire had a clinic code number of the participant. The sole purpose of the code was to enable the researcher only to provide necessary intervention like referral if needed whilst maintaining confidentiality.

Socio-demographic data was presented by frequency tables and pie charts. Distribution of data was shown by measures of central tendencies. Relationships between the variables were shown by Pearson's correlation (Pearson's r). The associations between the variables were determined by Pearson's Chi square (p-value).

3.12 Ethical Consideration

Ethical approval to conduct this study was obtained from Kenyatta National Hospital and University of Nairobi Ethics and Research Committee (KNH-UON ERC)

attached **Appendix X** and each rehabilitation centre administration attached **Appendix XI**. The researcher consulted with directors of each rehabilitation centre to ensure high ethical standards were maintained and to generate the necessary support required for the smooth conduct of the research.

Informed written consent was requested from each patient before absorption into the study and respondents were at liberty to opt out of the study at any time during the process without loss of any benefits. There were no monetary gains. All information obtained from respondents was confidential and only used for the purposes of the study. Names were recorded and filled questionnaires were kept in locked cabinet with access controlled by the principal investigator. Data inputted into computer was protected with a password that only the principal investigator was privy to.

Psychological invasiveness was an expected psycho-social harm and was normalized by the researcher. This occurred when some of the test questions were judged to be offensive. The researcher at point of treatment and referral normalized the psychological aspect.

CHAPTER FOUR: RESULTS

4.1 Introduction

This chapter presents the results of this study according to the objectives. It depicts the socio-demographic profiles, prevalence and severity of substance use, prevalence of PTSD and prevalence and severity of depression and their associations.

4.2 Response Rate

A total of 233 respondents filled the questionnaires but 11 were considered incomplete and were excluded in this analysis. The response rate was 95.3% and considered very good because it was more than 70% (Mugenda & Mugenda, 2003).

4.3 Socio-demographic Characteristics

Majority (28.5%) of the participants were in the age group 31-35 years, followed by 19.5% who were aged between 36-40 years, then 19.0% in the age group 26-30 years and above 41 years, 14.0% were aged between 18-25 years. Majority (91.0%) of the respondents were males. Most of the respondents (40.3%) were married, 35.7% were single (never married) while 24.0% were either divorced, separated or widowed. Majority of the respondents (77.9%) had attained tertiary level of education, while 22.1% had attained secondary level of education. Most of the respondents (44.5%) were employed, 33.3% were unemployed and 21.6% were in business. Most of the respondents (40.1%) had never been exposed to trauma, 37.4% had been exposed to significant life event, 19.4% had been exposed to physical injury and 3.2% had been exposed to sexual assault. This is shown in table 4.1.

Table 4.1
Socio-demographic characteristics of the respondents

Variable	Category	Frequency (N=222)	Percentage (%)
Gender	Female	20	9.0
	Male	202	91.0
Age	18-25	31	14.0
	26-30	42	19.0
	31-35	63	28.5
	36-40	43	19.5
	Above 41	42	19.0
	Non-Response	*1*	
Marital Status	Single (Never Married)	79	35.7
	Married	89	40.3
	Divorced/Separated/Widowed	53	24.0
	Non-Response	1	
Education Level	Secondary	49	22.1
	Tertiary	173	77.9
Occupational Status	Unemployed	41	18.8
	Business	47	21.6
	Employed	97	44.5
	Student	33	15.1
	Non-Response	*4*	
Exposure to trauma	Sexual assault	7	3.2
	Physical injury	43	19.4
	Significant life event	83	37.4
	No Trauma	89	40.1
Exposure to trauma	No	89	40.1
	Yes	133	59.9

4.4 Prevalence of substance use

Majority of the respondents (97.7%) used alcohol through beer products (92.3%), wines (83.3%), chang'aa (49.5%) and muratina (44.6%). This was followed by tobacco (64.4%), half of the respondents (50%) used Khat/Miraa and 25.7% used other substances. Table 4.2, figure 4.1 and 4.2 illustrate the prevalence of substances used and their 95% confidence interval.

Table 4.2
Prevalence of substances used

Drug/Substance	Frequency	%	95% C.I	
			Lower	Upper
a) Tobacco products (cigarettes, chewing tobacco, Cigara, Kiraiko)	143	64.4	58.1	70.7
b) Beer Products (Tusker, Tusker malt, Guinness, Senator, White cap)	205	92.3	88.7	95.5
c) Wines (Fighter, Kenya cane KC)	185	83.3	77.9	87.8
d) Changaa'[1]	110	49.5	43.2	56.3
e) Karubu, Muratina[2]	99	44.6	39.2	51.3
f) Alcohol	**217**	**97.7**	**95.9**	**99.5**
g) Miraa/irungi, Khat, kangeta, /Mugoka, kuber,	111	50.0	44.1	55.9
h) Other	57	25.7	20.3	31.5

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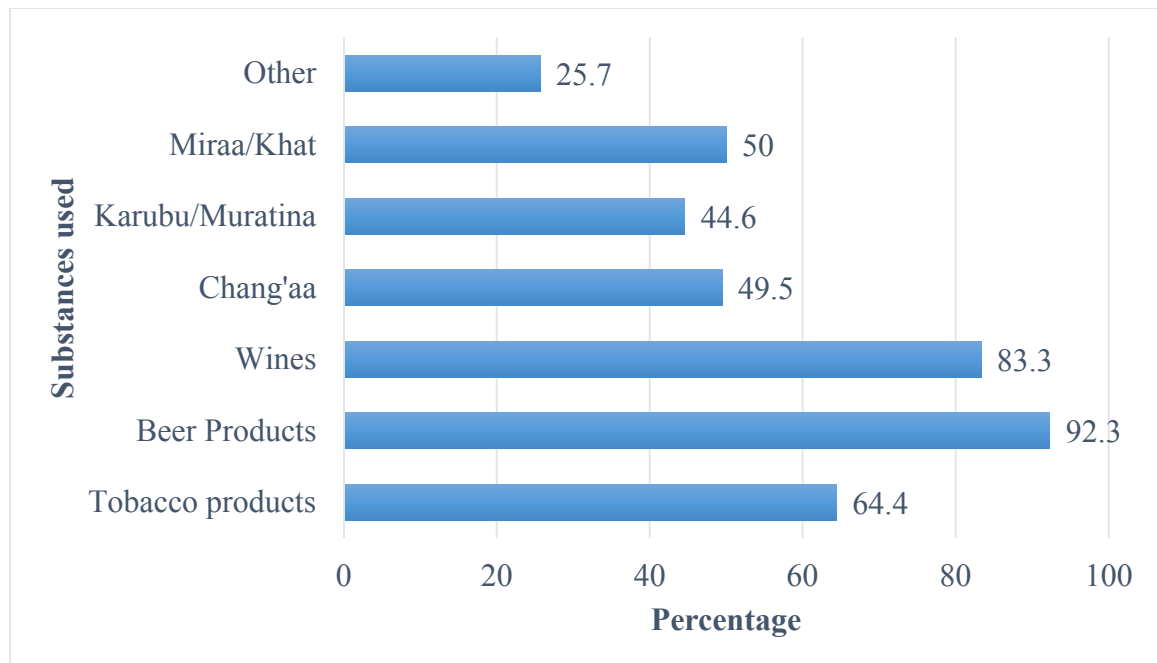
[1] A traditional home brewed spirit in Kenya mainly made from distillation and fermentation of grain e.g. millet, sorghum and maize.
[2] Alcoholic drink common in central Kenya made from sausage tree yeast extracts.

Figure 4.1 Prevalence of substances used
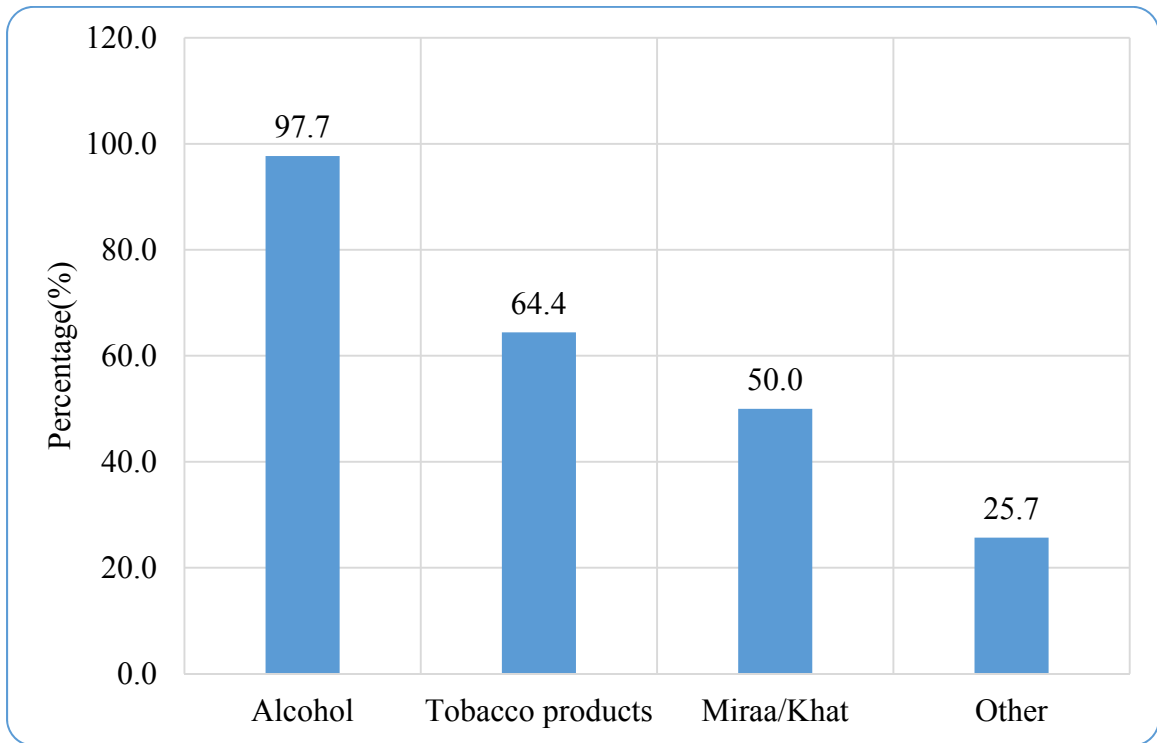
Figure 4.2 Prevalence of substances used

4.5 Severity of substance use

The most prevalent substance in which the respondents were using in high risk levels was alcohol. Table 4.3, figure 4.3 and 4.4 shows the risk levels of various substances and their 95% confidence interval.

Table 4.3
Risk levels of various substances used

Drug/Substance	Low or No Risk		Moderate Risk		High Risk	
	N	% (95% C.I)	n	% (95% C.I)	n	% (95% C.I)
a) Tobacco products (cigarettes, chewing tobacco, Cigara, Kiraiko)	89	40.1 (33.3-46.4)	120	54.1 (47.7-60.8)	13	5.9 (2.7-9.5)
b) Beer Products (Tusker, Tuskermalt, Guinness, Senator, White cap)	65	29.3 (23.4-35.1)	92	41.4 (35.1-48.2)	65	29.3 (23.0-35.6)
c) Wines (Fighter, Kenya cane(KC))	84	37.8 (31.5-44.1)	86	38.7 (32.4-45.0)	52	23.4 (18.0-29.3)
d) Changaa'	161	72.5 (66.2-78.4)	37	16.7 (11.7-22.1)	24	10.8 (7.2-14.9)
e) Karubu, Muratina	167	75.2 (69.4-81.1)	46	20.7 (15.3-26.1)	9	4.1 (1.8-7.2)
f) Alcohol	**45**	**21.6 (16.2-27.5)**	**92**	**41.4 (34.7-48.2)**	**82**	**36.9 (30.2-43.2)**
g) Miraa/irungi, Khat, kangeta, /Mugoka, kuber,	125	56.3 (49.5-62.6)	71	32.0 (26.1-38.3)	26	11.7 (7.7-15.8)
h) Other	175	78.8 (73.4-84.7)	38	17.1 (12.2-22.5)	9	4.1 (1.8-6.8)
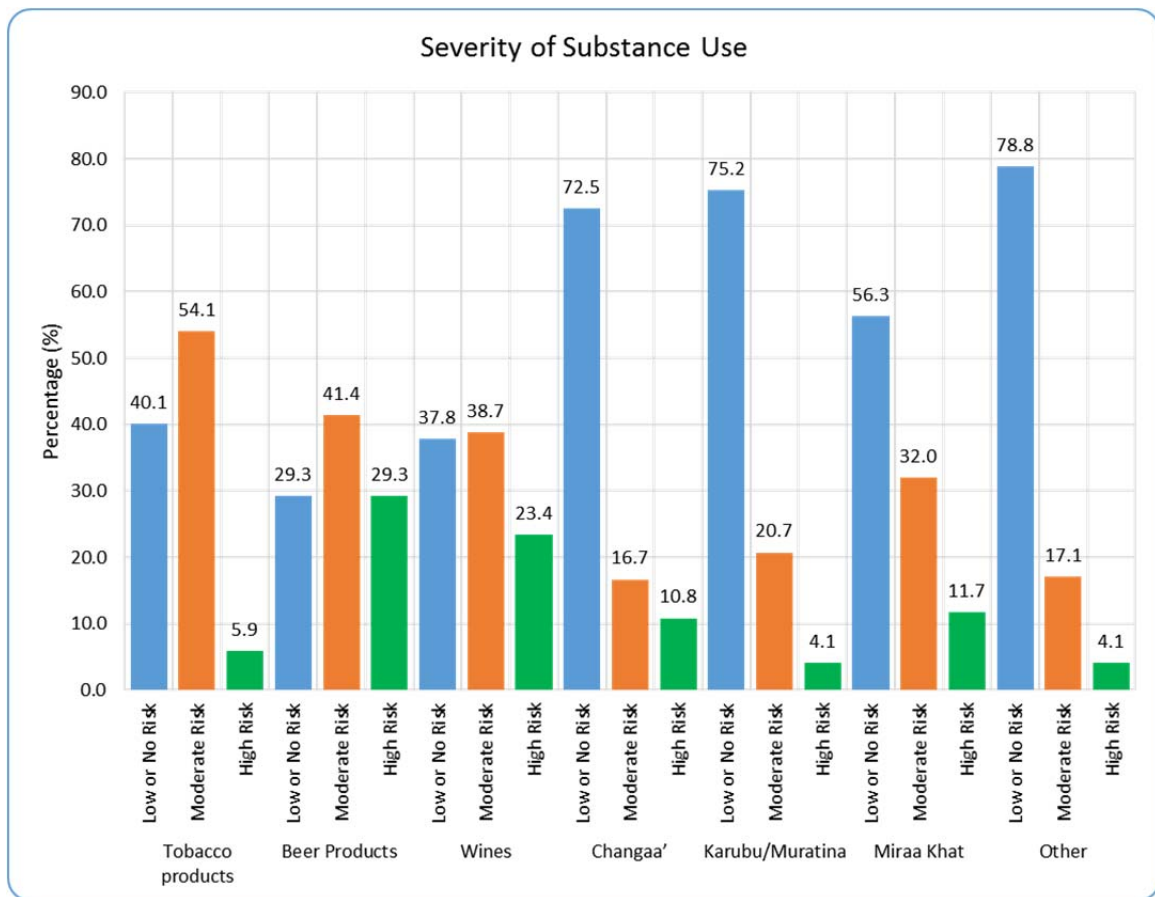
Figure 4.3 Severity of substances used
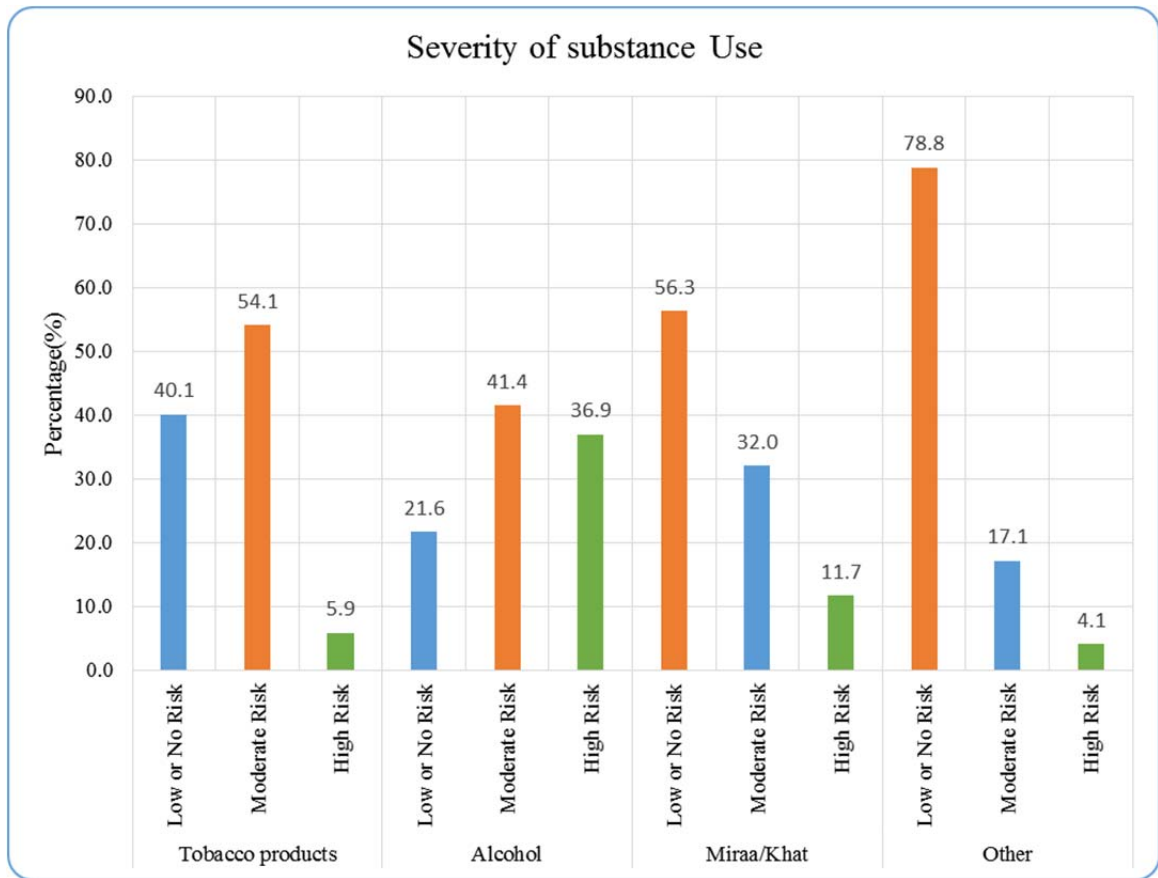
Figure 4.4 Severity of substances used

4.6 Measures of central tendency of ASSIST scores

Alcohol users had the highest mean, median, S.D and range for their ASSIST scores compared to other substances. This is shown in table 4.4.

Table 4.4
Mean score of substances used

Drug/Substance	Mean	Median	S.D.	Min.	Max
a) Tobacco products	10.1	9.5	9.9	0.0	31.0
b) Beer Products	17.4	15.0	11.7	0.0	65.0
c) Wines	14.4	12.0	11.4	0.0	39.0
d) Changaa'	7.0	0.0	10.4	0.0	39.0
e) Karubu, Muratina	5.1	0.0	8.1	0.0	34.0
f) Alcohol	**19.5**	**16.5**	**11.4**	**0.0**	**65.0**
g) Miraa/ Khat,	7.7	0.0	10.8	0.0	39.0
h) Other	2.9	0.0	7.1	0.0	34.0

4.7 Prevalence of PTSD

The prevalence of provisional PTSD diagnosis based on the cut-off 33 and above was 32.0% (95% C.I., 25.7-37.8). Based on the DSM-5 Diagnostic rule the prevalence of PTSD was 27.5% (95% C.I., 22.1-33.3). The mean PCL-PTSD scores was 22.9±20.7 and ranged from 0-80. This is shown in table 4.5, figure 4.5 and 4.6.

Table 4.5
PCL-5 PTSD status

PCL-5 PTSD	Status	Frequency	%	95% C.I	
				Lower	Upper
Provisional PTSD Diagnosis (Score of 33 and Above)	Negative	151	68.0	62.2	74.3
	Positive	71	32.0	25.7	37.8
Provisional PTSD Diagnosis (DSM-5 Diagnostic Rule)	Negative	161	72.5	66.7	77.9
	Positive	61	27.5	22.1	33.3
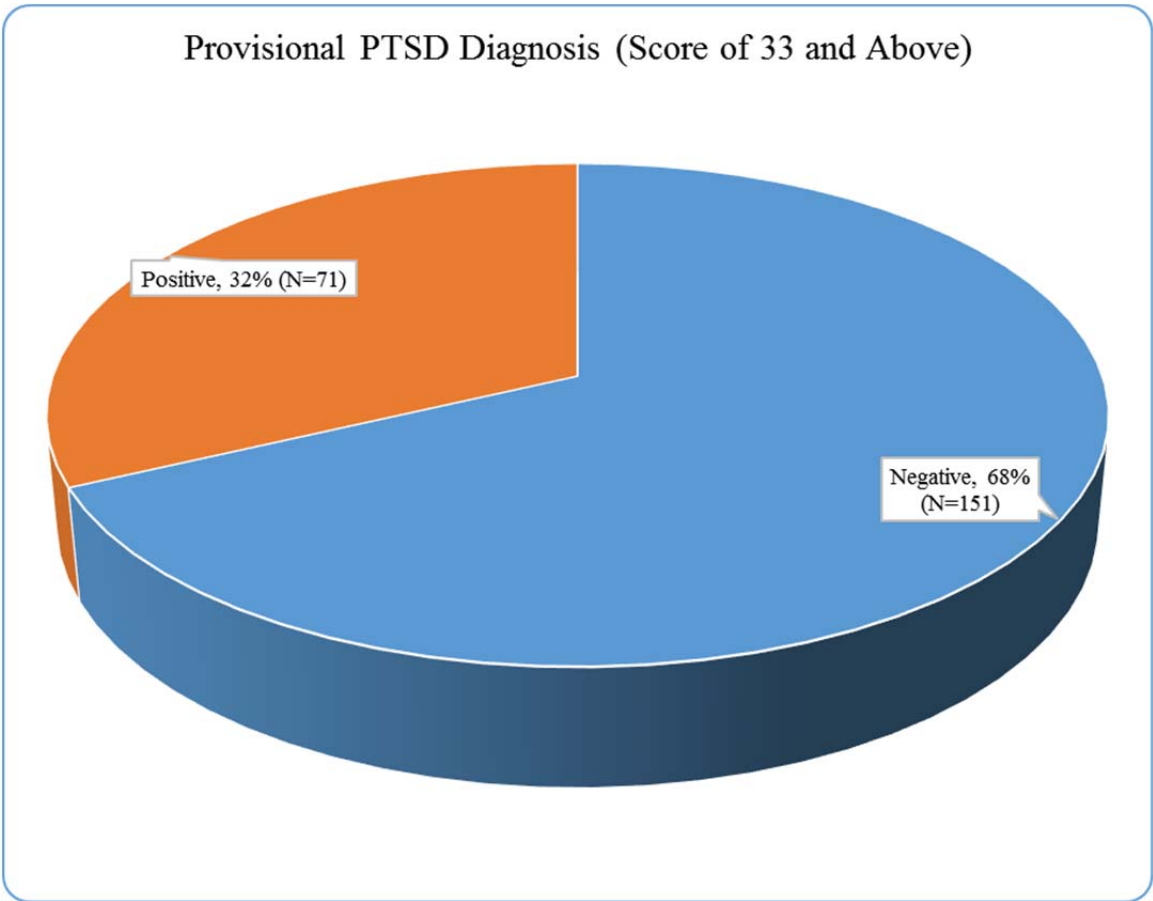
Figure 4.5 Prevalence of PTSD (Score of 33 and above)

Provisional PTSD Diagnosis (DSM-5 Diagnostic Rule)

27% (N=61)

73% (N=161)

- Negative
- Positive
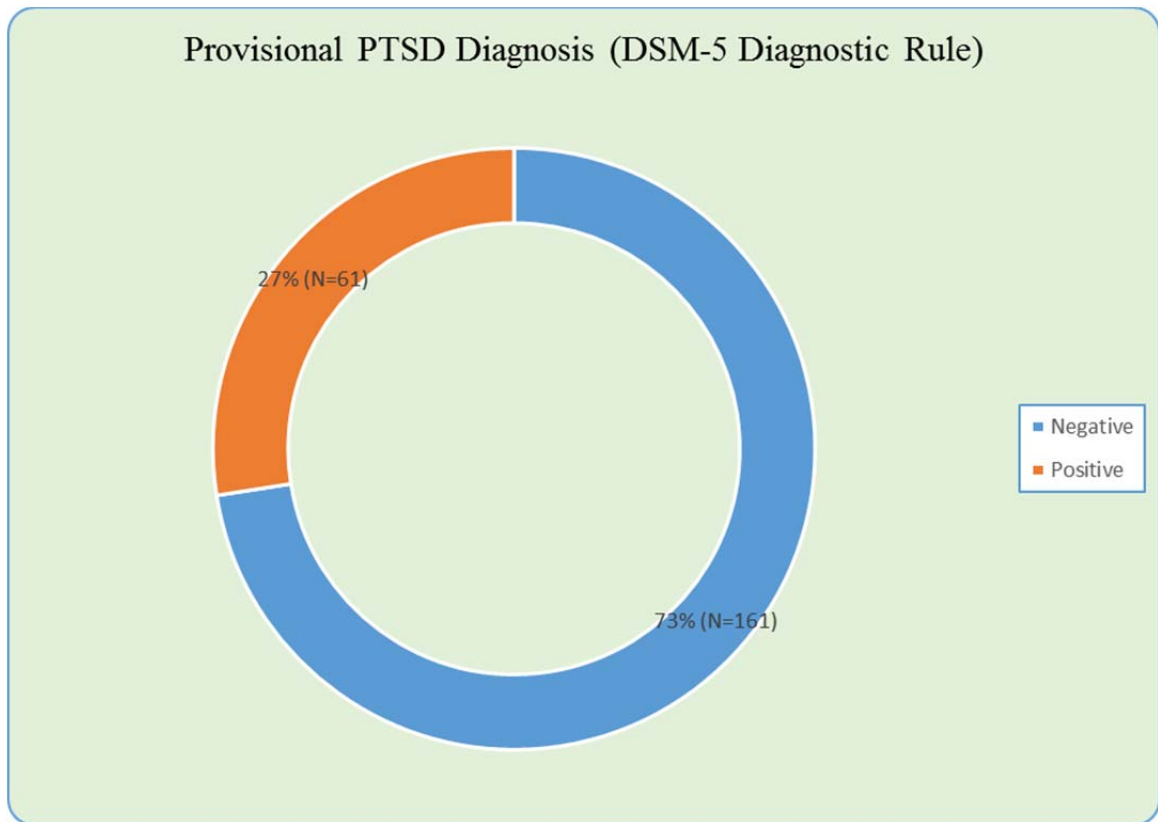
Figure 4.6 Prevalence of PTSD (DSM-5 Diagnostic Rule)

4.8 Severity of Depression

The prevalence of clinical depression was 34.2%. Half of the respondents (50%) were classified as having minimal depression, 15.8% had mild depression, 13.5% had moderate depression and 20.7% had severe depression. The mean depression score was 16.3±13.6 and ranged from 0-54. The depression severity is tabulated in table 4.6 and figure 4.7.

Table 4.6
Depression severity on BDI

BDI-Depression severity	Frequency	%	95% C.I	
			Lower	Upper
Minimal Depression (0-13)	111	50.0	42.8	56.3
Mild Depression (14-19)	35	15.8	11.3	20.7
Moderate Depression (20-28)	30	13.5	9.5	18.0
Severe Depression (29-63)	46	20.7	15.3	26.1
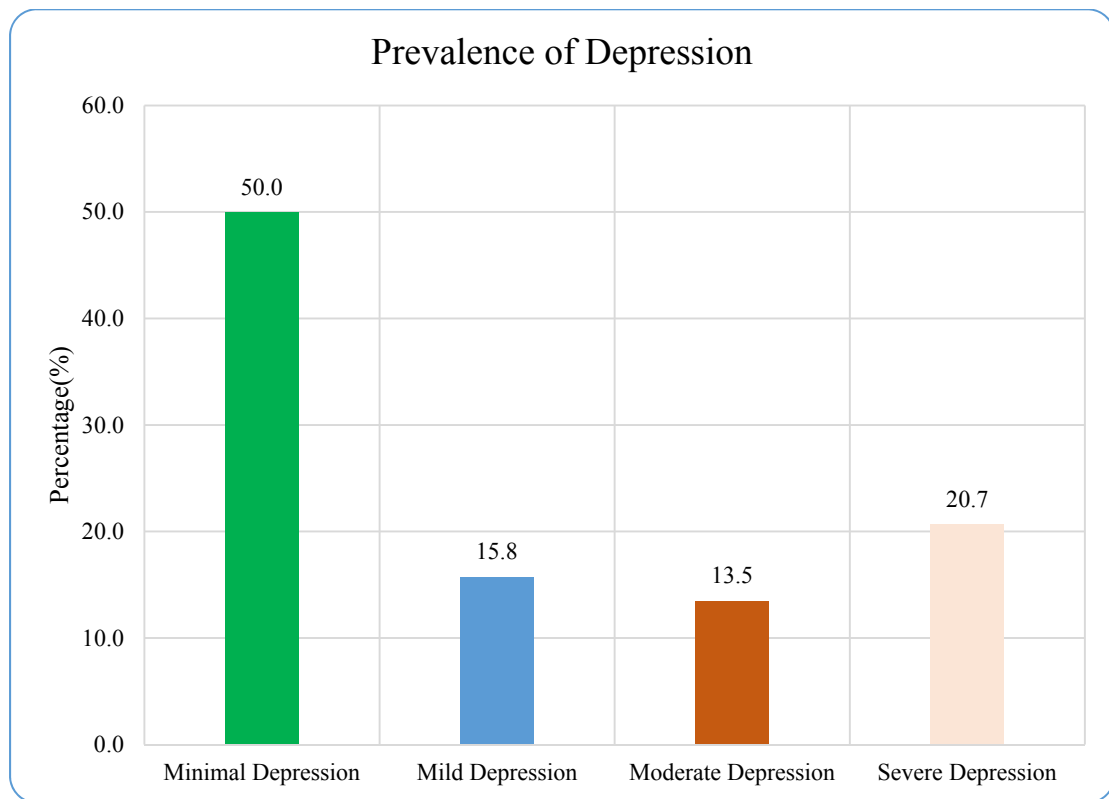
Figure 4.7 Prevalence of depression

4.9 Correlation between PTSD, depression and substance use scores

There was a significant positive correlation between depression and PTSD scores and all substance use scores using ASSIST apart from tobacco, muratina and khat scores; presented in table 4.7.

Table 4.7
Correlation between scores on ASSIST with depressive and PTSD scores

Pearson's Correlation	1	2	3	4	5	6	7	8	9
1. PCL-5 PTSD Scores	1								
2. BDI Depression Scores	0.545**	1							
3. ASSIST-Tobacco Products Scores	0.103	-0.055	1						
4. ASSIST-Beer Products Scores	0.269**	0.375**	0.297**	1					
5. ASSIST-Wines Scores	0.200**	0.188**	0.258**	0.487**	1				
6. ASSIST-Chang'aa Scores	0.140*	-0.010	0.354**	0.203**	0.336**	1			
7. ASSIST-Karubu/Muratina Scores	0.079	-0.004	0.375**	0.217**	0.291**	0.510**	1		
8. ASSIST-Miraa/Khat Scores	0.052	-0.032	0.550**	0.160*	0.217**	0.244**	0.422**	1	
9. ASSIST-Other Scores	0.161*	0.016	0.127	-0.025	-0.019	0.146*	0.255**	0.191**	1

Note: **. Correlation is significant at the 0.01 level *. Correlation is significant at the 0.05 level (2-tailed).

4.10 Socio-demographic factors associated with PTSD

Females had significantly higher scores of PTSD as compared to their male counterparts. There was a significant difference between PTSD scores and marital status (p=0.001). Post hoc-test using Bonferroni correction for pairwise comparison revealed that significant differences were between those who were married and those who were either divorced, separated or widowed with the latter having higher PTSD scores. No significant differences were found between those who were single (Never married) and those who were married. Exposure to trauma was significantly associated with PTSD scores. Post hoc test for pairwise comparison revealed that significant differences were found between those who had not been exposed to trauma and those who had experienced

significant life event. No significant differences were found in terms of age and education level. This is shown in table 4.8.

Table 4.8
Association between socio-demographic characteristics and PTSD scores

Variable	Category	N	Mean±SD	t	d.f.	P-Value
Gender	Female	20	31.5±18.6	1.95	220	0.053
	Male	202	22.1±20.7			
Education Level	Secondary	49	20.1±20.5	-1.09	220	0.277
	Tertiary	173	23.7±20.7			
Age	18-25	31	22.0±18.3	*1.40*	*(4, 216)*	0.234
	26-30	42	27.6±21.8			
	31-35	63	19.1±19.1			
	36-40	43	26.0±24.1			
	Above 41	42	21.1±19.4			
Marital Status	Single (Never Married)	79	22.9±19.6	*7.21*	*(2, 219)*	**0.001**
	Married	89	18.1±17.4			
	Divorced/Separated/Widowed	53	31.3±24.8			
Occupational Status	Unemployed	41	23.3±19.7	*1.24*	*(3, 214)*	0.296
	Business	47	27.1±22.5			
	Employed	97	21.0±20.7			
	Student	33	19.5±15.6			
Exposure to trauma	Sexual assault	7	34.6±18.7	*5.42*	*(3, 218)*	**0.001**
	Physical injury	43	24.9±20.1			
	Significant life event	83	27.7±21.9			
	No Trauma	89	16.6±17.5			

4.11 Independent predictors of PTSD

This is a presentation of the results of factors associated with PTSD after controlling for all the other factors that were associated with PTSD at the bivariate level, presented in table 4.9. Participants who were married had significantly lower levels of PTSD scores as compared to those who were either divorced/ Separated or Widowed (β=-11, 95% Confidence Interval -17.8 to -4.4, p=0.001). Participants who had experienced

physical injury (β=8.0, 95% Confidence Interval 0.8 to 15.1, p=0.028) and significant life

event (β=9.7, 95% Confidence Interval 3.8 to 15.6, p=0.001) had significantly higher

levels of PTSD as compared to those who had not been exposed to trauma. No significant

differences were found in terms of gender (P>0.05).

Table 4.9
Social-demographic correlates of PTSD scores

Variable	Category	B	S. E.	95% CI		P-Value
				Lower	Upper	
Gender	Female	6.803	4.944	-2.887	16.493	0.169
	Male	Ref.				
Marital Status	Single (Never Married)	-6.271	3.505	-13.140	0.598	0.074
	Married	-11.100	3.419	-17.802	-4.399	**0.001**
	Divorced/Separated/ Widowed	Ref.				
Exposure to trauma	Sexual assault	11.339	8.275	-4.879	27.557	0.171
	Physical injury	8.004	3.639	0.871	15.137	**0.028**
	Significant life event	9.693	3.019	3.775	15.611	**0.001**
	No Trauma	Ref.				

4.12 Socio-Demographic factors associated with depression

There was a significant difference between depression scores and marital status

(P=0.013). Post hoc-test using Bonferroni correction for pairwise comparison revealed

that significant differences were between those who were married and those who were

either divorced/separated or widowed with the latter having higher depression scores and

between those who were single (never married) vs. those who were either

divorced/separated or widowed with the latter having higher depression scores. No

significant differences were found between those who were single (Never married) and

those who were married. Participants who were aged 26-40 years had significantly higher

level of depression as than those aged 18-25 and above 41 years.

Occupation status was significantly associated with depression scores. Participants who were in business had significantly higher levels of depression as than those who were unemployed and students. No significant differences were found between employed participants and those in business. No significant differences of depression were found in terms of gender and exposure to trauma. This is shown in table 4.10.

Table 4.10
Association between BDI scores and socio-demographic variables

Variable	Category	N	Mean±SD	t	d.f.	P-Value
Gender	Female	20	18.1±14.2	0.63	220	0.526
	Male	202	16.1±13.6			
Education Level	Secondary	49	14.5±12.0	-1.04	220	0.301
	Tertiary	173	16.8±14.0			
Age	18-25	31	12.4±9.4	*2.40*	*(4, 216)*	**0.051**
	26-30	42	19.8±14.4			
	31-35	63	17.2±14.4			
	36-40	43	17.9±15.2			
	Above 41	42	12.6±11.8			
Marital Status	Single (Never Married)	79	14.4±11.8	*4.46*	*(2, 218)*	**0.013**
	Married	89	15.2±12.9			
	Divorced/Separated/Widowed	53	21.1±16.2			
Occupational Status	Unemployed	41	13.4±11.2	*4.14*	*(3, 214)*	**0.007**
	Business	47	21.5±15.9			
	Employed	97	16.5±13.7			
	Student	33	12.0±10.7			
Exposure to trauma	Sexual assault	7	19.7±10.0	*0.28*	*(3, 218)*	0.844
	Physical injury	43	17.3±14.9			
	Significant life event	83	15.9±13.8			
	No Trauma	89	15.8±13.2			

4.13 Independent predictors of depression

These are results of factors associated with depression scores after controlling for all the other factors that were associated with it at the bivariate level as tabulated in table 4.11. Participants who were single (Never married) and those who were married had significantly lower levels of depression scores (β=-6.2% Confidence Interval -12.1 to -0.3, p=0.041 and β=-6.6% Confidence Interval -11.0 to -2.1, p=0.004), respectively as compared to those who were either divorced/separated or widowed. Participants who had been in business (β=8.5, 95% Confidence Interval 1.1 to 15.9, p=0.024) had significantly higher levels of depression as than those who were students. Participants who were aged between 26-30 years and 31-35 years had significantly higher levels of depression scores (β=10.1% Confidence Interval 4.1 to 16.0, p=0.001 and β=-5.8% Confidence Interval 0.6 to 11.1, p=0.027), respectively as compared to those who were aged above 41 years.

Table 4.11
Social-demographic correlates of BDI scores

Variable	Category	β	S. E.	95% CI		P-Value
				Lower	Upper	
Age	18-25	5.152	3.886	-2.465	12.769	0.185
	26-30	10.062	3.028	4.127	15.997	**0.001**
	31-35	5.855	2.651	0.660	11.051	**0.027**
	36-40	5.471	2.809	-0.034	10.976	0.051
	Above 41	Ref.				
Marital Status	Single (Never married)	-6.199	3.029	-12.136	-0.262	**0.041**
	Married	-6.559	2.269	-11.007	-2.112	**0.004**
	Divorced/Separated/ Widowed	Ref.				
Occupational Status	Unemployed	0.684	3.413	-6.006	7.374	0.841
	Business	8.504	3.781	1.094	15.915	**0.024**
	Employed	4.222	3.625	-2.883	11.327	0.244
	Student	Ref.				

4.14 Factors associated with PTSD

Table 4.12 tabulates the association between socio-demographic characteristics and PTSD. Respondents who were divorced/separated or widowed were 9.3 times more likely to develop PTSD compared to the married respondents, p=0.009. Results indicated respondents who had sexual assault were 12.6 times more likely to develop PTSD than those without traumatic event, p=0.006. Results further indicated that respondents with severe depression symptoms were 41.8 times more likely to develop PTSD, p<0.001 than those without depressive symptoms.

Table 4.12
Association between PTSD and socio-demographic factors

Variable	Category	PCL-5<33 (Negative)	PCL-5>=33 (Positive)	χ^2	d.f	P-value
Gender	Female	11(55.0%)	9(45.0%)	3.4	1	0.066
	Male	150(74.3%)	52(25.7%)			
Age	18-25	23(74.2%)	8(25.8%)	6.5	4	0.163
	26-30	27(64.3%)	15(35.7%)			
	31-35	50(79.4%)	13(20.6%)			
	36-40	27(62.8%)	16(37.2%)			
	Above 41	34(81.0%)	8(19.0%)			
Marital Status	Single (Never Married)	56(70.9%)	23(29.1%)	9.3	2	**0.009**
	Married	73(82.0%)	16(18.0%)			
	Divorced/Separated/Widowed	31(58.5%)	22(41.5%)			
Education Level	Secondary	39(79.6%)	10(20.4%)	1.6	1	0.209
	Tertiary	122(70.5%)	51(29.5%)			
Occupational Status	Unemployed	30(73.2%)	11(26.8%)	2.0	3	0.573
	Business	31(66.0%)	16(34.0%)			
	Employed	73(75.3%)	24(24.7%)			
	Student	26(78.8%)	7(21.2%)			
Exposure to trauma	Sexual assault	4(57.1%)	3(42.9%)	12.6	3	**0.006**
	Physical injury	27(62.8%)	16(37.2%)			
	Significant life event	53(63.9%)	30(36.1%)			
	No trauma	56(87.5%)	8(12.5%)			
Depression Levels	Minimal Depression	99(89.2%)	12(10.8%)	41.8	3	**<0.001**
	Mild Depression	26(74.3%)	9(25.7%)			
	Moderate Depression	17(56.7%)	13(43.3%)			
	Severe Depression	19(41.3%)	27(58.7%)			

CHAPTER FIVE: DISCUSSION, CONCLUSIONS AND RECOMMENDATIOS

5.1 Introduction

This chapter discusses the results in the context of objectives.

5.2 Discussion

5.2.1 Severity of substance use

This study found that majority of the respondents (97.7%) used alcohol, followed by tobacco (64.4%), half of the respondents (50%) used Khat/Miraa and 25.7% used other substances. Alcohol use had the highest risk levels compared to other substances. This is comparable to a study by Wu et al (2010) who found the prevalence of alcohol use by respondents in rehabilitation centres was 41-97%, followed by tobacco (17-74%) and there was a moderate to high risk for alcohol use.

5.2.2 Prevalence and severity of PTSD in substance use disorders

This study found the prevalence of PTSD diagnosis based on the cut-off 33 and above was 32.0% while DSM-5 Diagnostic rule was 27.5%. This is similar to several studies around the world. In Cyprus, Papastavrou et al (2011) found a prevalence of 40.6% in SUD respondents (Papastavrou, Farmakas, Karayiannis, & Kotrotsiou, 2011). A study by Gielen et al (2012) in Netherlands found this prevalence at 36.6% (Gielen, Havermans, Tekelenburg, & Jansen, 2012). These findings are also comparable to a meta-analytic review of PTSD and SUD co-morbidity which found this prevalence to be 30%-50% (Brady, McCauley, & Back, 2015).

This is in contrast to several studies which found slightly higher prevalence of PTSD; Ouimette et al (1998), Jacobsen et al (2001), Pietrzak et al (2011) and Dore et al (2012) found 50%, 43%, 46.4% and 45%, respectively (Ouimette, Brown, & Najavits,

1998) (Jacobsen, Southwick, & Kosten, 2001) (Pietrzak, Goldstein, Southwick, & Grant, 2011) (Dore, Mills, Murray, Teesson, & Farrugia, 2012). The differences in prevalence of PTSD can be attributed to study design differences and our study having one public rehabilitation centre.

5.2.3 Prevalence and severity of depression in substance use disorders

Our study found that more than a third (34.2%) had clinical depression. Of the respondents with depression, half of respondents (50%) had minimal depression, while 15.8% had mild depression, 13.5% had moderate depression while 20.7% had severe depression. This is similar to several studies around the world. In Kenya, a study conducted in Kangemi found the prevalence of moderate and severe depression in SUD patients was 63.8% at intake and after completion of rehabilitation was 30.2% (Kuria, et al., 2012). A systematic review found nearly one-third of SUD patients have depression (Davis, Uezato, Newell, & Frazier, 2008). In Australia, Dore et al (2012) found nearly 20% of SUD patients had moderate to severe depression (Dore, Mills, Murray, Teesson, & Farrugia, 2012). This is also comparable to a prevalence of 21% found by Brière et al (2014) in the US (Brière, Rohde, Seeley, Klein, & Lewinsohn, 2014).

This differs with a South African study which found a lower prevalence of comorbidity of depression and SUD at 8.6% (Saban, et al., 2014). The differences in prevalence and severity of depression can be attributed to study design differences and our study having one public rehabilitation centre.

5.2.4 Socio-demographic factors associated with PTSD

This study found that females had significantly higher scores of PTSD as compared to the male respondents. Those who were either divorced, separated or widowed had higher PTSD scores compared to those who were married. Exposure to trauma was significantly associated with PTSD scores. Majority of the respondents with high scores of PTSD had attained tertiary level of education at 77.9% and were in employment at 64.9%. Participants who had experienced physical and significant life event had significantly higher levels of PTSD as compared to those who had not been exposed to trauma. This is similar to a study in Australia that found nearly 80% of SUD patients had encountered one traumatic event and females had higher scores of PTSD scores compared to males (Dore, Mills, Murray, Teesson, & Farrugia, 2012).

This differs from a study that found SUD individuals with PTSD have poorer socioeconomic status (Riggs, Rukstalis, Volpicelli, Kalmanson, & Foa, 2003). In Netherlands, respondents with this dual diagnosis were highly likely to be unemployed and have lower education level (Gielen, Havermans, Tekelenburg, & Jansen, 2012). These findings differed in terms of occupation status and education level. This is explained by our study conducted in mainly private rehabilitation centres and one public rehabilitation centre.

5.2.5 Socio-demographic factors associated with depression

This study found that SUD respondents who were divorced, separated or widowed had higher scores for depression than those who were single (never married) or married. Respondents who were aged 26-40 years had increased levels of depression than those aged 18-25 and above 41 years. Respondents who were in business had increased levels

of depression than those who were unemployed and students. Respondents aged between 26-30 years and 31-35 years had increased levels of depression than those aged above 41 years.

This is similar to a study in Australia that found SUD patients in the age group 24-30 years had higher prevalence of depression compared to ages 30 and above (Brière, Rohde, Seeley, Klein, & Lewinsohn, 2014). This can be explained by the current economy.

5.2.6 Association between depression and PTSD in SUD

Our study found that there was a significant positive correlation between depression and PTSD scores and all other drug and substance scores apart from tobacco, muratina and khat scores. This is similar to a study by Blanco et al (2013) who found that there were increased depressive symptoms in PTSD and SUD comorbidity (Blanco, et al., 2013). It was also reported that substance use was found to be positively correlated with the severity of symptomatology of PTSD (Bremner, Southwick, Darnell, & Charney, 1996). In Kenya, Ndetei et al (2008) found a positive correlation between alcohol dependence and SUD (Ndetei, et al., 2008). In Kangemi, Kenya, depression was found to increase the craving for alcohol (Kuria, et al., 2012).

In New Zealand, alcohol dependence was reported to cause an increased rate of major depressive disorder (Fergusson, Boden, & Horwood, 2009). Furthermore, prior alcohol use disorder had a positive association with depression and increased the risk by four times (Hasin & Grant, 2002). In the Netherlands, a study found a strong positive association between SUD and PTSD (Gielen, Havermans, Tekelenburg, & Jansen, 2012).

5.3 Conclusion

The findings of this study add some clarity to the prevalence and severity of depression and PTSD in substance use disorder patients in rehabilitation centres. Most of the respondents had a high risk use pattern for more than one substance. There was a significant number of respondents who had clinical PTSD and depression as comorbidities. PTSD and depression co-morbidities form a critical sub-group of substance use disorder patients in rehabilitation centres. Most respondents with comorbidities of PTSD and depression had experienced a significant life event. Those who were single (never married) divorced, separated or windowed had a high risk of comorbidity. The young had a significant risk for co-occurrence of the diagnosis. Thus, correct diagnosis is essential to managing SUD patients to prevent chronic course of illness and relapses. The clinicians in rehabilitation centres should routinely screen for depression and PTSD in individuals undergoing rehabilitation. Policy makers should design protocols for integrated management of co-morbidities. More training on how to handle addiction plus co-morbidities.

5.4 Recommendations

Rehabilitation centres should incorporate the practice of assessing the severity of substance use and related poly drug use. Rehabilitation centres should also focus on the assessment of emotional distress, depression and trauma related disorders to optimize outcomes. Mental health practioners should understand the presence and effect of dual diagnosis among substance use disorder clients. Policy makers and stakeholders should formulate relevant policies for treatment of commodities among substance use patients. Future researchers need to set-up longitudinal studies to assess impact of co-morbidities

of depression and PTSD on rehabilitation treatment outcome. Further studies can look at the causal relation between SUD, depression and PTSD. Researchers can do a longitudinal follow up of similar population and conduct more qualitative researches in Kenya. Future studies could also focus on the effectiveness of the rehabilitation services in view of co-existing diagnoses.

5.5 Limitation

The limitation in the study was recall bias affected by self-report. This was mitigated by probing as much as possible.

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APPENDICES
Appendix I: Informed consent for patients in rehabilitation centres

INFORMATION AND CONSENT FORM FOR STUDY PARTICIPANTS

Name of Study: "Prevalence of depression and post-traumatic stress disorder among substance use disorder patients in rehabilitation centres in Nairobi and its environs."

Principal Investigator: Dr. Joseph Masila

A. Consent explanation (To be read and questions answered in a language in which the study subject is conversant; English or Kiswahili, and those who cannot read will be thoroughly explained to).

My name is Dr. Joseph Masila; I am a pursuing a Masters in Psychiatry at University of Nairobi. I am doing a study entitled "The prevalence of Depression and Post traumatic stress disorder among substance use disorder patients in rehabilitation centres in Nairobi and its environs" as part of my degree award fulfillment. My supervisors are Dr. Khasakhala and Dr. Owiti who are all Lecturers in the Department of Psychiatry, University of Nairobi.

The aim of this study is to determine the association between substance use disorder and depression and PTSD among patients in rehabilitation centres in Nairobi and its environs. This study will be conducted by me under supervision of my supervisors and rehabilitation centres in Nairobi and its environs. This is a medical research and you are required to understand the following which apply to all in medical research.

1. Your participation is completely voluntary and you may withdraw consent at any time in the course of the interview.

2. Refusal to participate will not in any way affect your health services which you are entitled.

3. After reading the explanation, don't hesitate to ask any questions in case you need clarifications.

4. I will assess your reasons for use of substances by using an instrument which will take about 30 minutes of your time.

5. There is no right or wrong answer.

6. No invasive procedures such as drawing blood will be involved and no risks will be posed to you except that you may experience an emotional disturbance through asking you emotional questions.

7. All information obtained from this study will remain confidential and your privacy will be upheld. Your name will only appear on the consent form which will be signed and kept separately from the study documents for legal purposes and for identification in case you will be found with psychological problems that need follow up.

8. There will be no material gain from this study. However, the overall study may be of benefit to patients on rehabilitation that may be having depression / PTSD and in general in terms of policy implementation and better intervention and care of substance use disorder in patients on rehabilitation programs.

9. During interviews, research participants who are found to have mental or physical problem will be provided with immediate counseling and referred for treatment and follow-up services in the appropriate departments.

10. Results of the study can be availed to you upon request.

If you have any questions related to this study, or your health you can call me on my telephone number 0727476760 or my lead supervisors at the department of psychiatry, University of Nairobi or KNH/ UON Ethics and Research Committee at Kenyatta National Hospital on telephone number **2726300 Ext 44102**or P.O BOX **20723 -00202**, Nairobi.

I, …………………………………………………………………….the undersigned do hereby volunteer to participate in this study. The nature and purpose have been fully explained to me by Dr. Joseph Masila.

The role I play by participating in the interviewee is to help the investigators collect information about the association between substance use disorders, depression and posttraumatic stress disorder. This information may or may not be useful in designing better ways to improve mental wellbeing in the future. My questions, if any, have been answered to my satisfaction. The Kenyatta National Hospital Research and Ethics Board, may be contacted by research subjects to discuss their rights on P.O Box 20723-0020 Nairobi or call on telephone number 02726300 Ext 44102

Participant's Signature

_____Date_____

Signature …………………

Researcher _____Date ……………………….

Signature ……………………

Investigators Statement

I (Dr. Joseph Masila) have explained to the respondent the nature and purpose of this study as described above. I have asked the respondent if there are any questions and I have answered them to the best of my knowledge and ability.

Witness Signature _____

Date_____

Appendix II: Consent form (Swahili version)

Jina langu ni Daktari Joseph Masila, Mimi ninasomea shahada ya uzamili katika utaalamu wa akili katika Chuo Kikuu cha Nairobi. Mimi ninafanya utafiti kuhusu "uwepo wa Unyogovu na PTSD katika wagonjwa katika vituo vya marakebisho vya Nairobi na mazingira yake" kama sehemu ya kutimiza kutuzwa shahada yangu. Wasimamizi wangu ni Daktari Khasakhala na Daktari Owiti ambao wote ni wahadhiri katika Idara ya utaalamu wa akili, Chuo Kikuu cha Nairobi.

Lengo la utafiti huu ni kutathmini uhusiano kati ya matumizi ya madawa ya kulevya na msongo wa mawazo na PTSD kati ya wagonjwa katika vituo vya marekebisho vya Nairobi na mazingira yake. Utafiti huu utafanywa nami chini ya usimamizi wa wasimamizi wangu katika vituo vya marekebisho Nairobi na mazingira yake. Huu ni utafiti wa matibabu na unatakiwa kuelewa yafuatayo ambayo hutumika kwa wote katika utafiti wa matibabu.

1. Kushiriki kwako ni kwa hiari na unaweza kuondoa ruhusa wakati wowote katika kipindi cha mahojiano.

2. Kukataa kushiriki hakuathiri kwa njia yoyote huduma yako ya afya ambayo una haki.

3. Baada ya kusoma maelezo, usisite kuuliza maswali yoyote ikiwa utahitaji ufafanuzi.

4. Nitatathmini sababu zako za matumizi ya madawa ya kulevya kwa kutumia chombo ambacho kitachukua dakika 30 za muda wako.

5. Hakuna jawabu sahihi au makosa.

6. Hakuna taratibu vamizi kama vile kuvutwa damu kutakakotumika na hakuna hatari utakayosababishiwa ila kwamba unaweza pitia masumbuko ya hisia kwa njia ya kuulizwa maswali yenye hisia.

7. Maelezo yote yatakayopatikana kutoka utafiti huu yatabaki siri na faragha yako itazingatiwa. Jina lako litaonekana tu kwenye fomu ya idhini ambayo itatiwa saini na kuhifadhiwa tofauti na nyaraka za utafiti kwa madhumuni ya kisheria na kwa ajili ya kutambua iwapo utapatikana na matatizo ya kisaikolojia ambayo yanahitaji ufuatiliaji.

8. Hakutakuwa faida yoyote ya kifedha kutoka utafiti huu. Hata hivyo, utafiti kwa jumla unaweza kuwa wa manufaa kwa wagonjwa kwenye viuo vya marekebisho ambao wanaweza kuwa na matatizo ya msongo wa mawazo/ PTSD na kwa ujumla katika suala la utekelezaji wa sera na kuboresha huduma ya shida za matumizi ya madawa ya kulevya katika wagonjwa walio kwenye mipango ya urekebishaji.

9. Wakati wa mahojiano, washiriki wa utafiti ambao hupatikana kuwa na matatizo ya akili au kimwili watapewa ushauri mara moja na kuelekezwa kwa ajili ya matibabu na huduma ya kufuatiliwa katika idara husika.

10. Matokeo ya utafiti yanaweza tolewa kwako kwa ombi.

Kama una maswali yoyote kuhusiana na utafiti huu, au afya yako unaweza nipigia kwenye simu yangu nambari 0727476760 au viogozi wasimamizi wangu katika idara ya utaalamu wa akili, Chuo Kikuu cha Nairobi au KNH / UON Kamati ya Maadili na Utafiti katika Hospitali ya kitaifa ya Kenyatta nambari ya simu**2726300 Ext 44102** au Sanduku la posta **20723 -00202**, Nairobi.

Mimi, …………………………………………………………………………. Ninayesaini najitolea kwa hiari yangu kushiriki katika utafiti huu. Asili na lengo lake nimeelezwa kwa kina na daktari Joseph Masila. Jukumu langu kushiriki katika utafiti ni kusaidia watafiti kukusanya habari kuhusu ushirikiano kati ya shida za matumizi ya madawa za kulevya, msongo wa mawazo na shida zijazo baada ya kuhusika katika matukio ya kutisha. Habari hii yaweza au haiwezi kuwa ya muhimu katika kuunda njia bora za kuboreshamaslahi ya akili siku za usoni. Tume ya maadili na utafiti ya hospitali ya kitaifa ya Kenyatta, yaweza fikiwa na washiriki wa utafiti kujadili haki zao kwenye Sanduku la Posta 20723-0020 Nairobi au simu kwenye nambari 02726300 Ext 44102

Jina……………………………………. Tarehe………….

 Saini………………………

Mtafiti ………………………………… Tarehe………………….

Saini………………………

Mimi (Dr. Joseph Masila) nimemuleleze mshirika lengo la utafiti huu kikamilifu kama ilivyo elezwa hapo juu. Nimeuliza mshirika iwapo kuna maswali yoyote na kuyajibu kwa kadiri ya ufahamu na uwezo wangu.

Mbele ya shahidi (Dr. Joseph Masila) ………

Saini………………………Tarehe……………….

Appendix III: Socio-demographic Questionnaire

1. Sex

   Female ☐

   Male ☐

2. Age

   18-25 ☐

   26-30 ☐

   31-35 ☐

   36-40 ☐

   41-50 ☐

   51-60 ☐

   61-70 ☐

3. Marital status

   Single ☐

   Married ☐

   Divorced/Separated ☐

   Widowed ☐

4. Education Level

   Primary ☐

   Secondary ☐

   Tertiary ☐

5. Occupational status

   Unemployed ☐

   Business ☐

   Employed ☐

   Student ☐

6. Occupation

7. Exposure to trauma

   Sexual assault ☐

   Physical injury ☐

   Significant life event ☐

   Other ☐

8. When was the above trauma experienced?

9. How many times have you experienced traumatic/significant life events?

Appendix IV: Socio-demographic questionnaire (Swahili version)

1. Jinsia

       Mwanamke ☐

       Mwanaume ☐

2. Umri

   18-25 ☐

   26-30 ☐

   31-35 ☐

   36-40 ☐

   41-50 ☐

   51-60 ☐

   61-70 ☐

3. Hali ya ndoa

   Pekeyako ☐

   Kwenye Ndoa ☐

   Talaka / mmetengana ☐

   Mjane ☐

4. Kiwango cha Elimu

   Msingi ☐

   Shule ya upili ☐

   Chuo Kikuu ☐

5. Hali ya Ajira

Ajira ☐

Biashara ☐

Kuajiriwa ☐

Mwanafunzi ☐

6. Kazi

7. Kuwa katika matukio ya kuumiza

unyanyasaji wa kimapenzi ☐

kuumia kimwili ☐

Tukio muhimu maishani ☐

Nyingine ☐

8. Ni wakati upi tukio hilo hapo juu lilitendeka?

9. Ni mara ngapi wewe umepata matukio ya kutisha/ matukio muhimu maishani?

The Alcohol, Smoking and Substance Involvement Screening and Test (ASSIST)

These set of questions comes from a brief interview about alcohol, tobacco products and other drugs. These questions ask about your experience of using these substances across your lifetime and in the past two months. These substances can be smoked, swallowed, snorted, inhaled, injected or taken in the form of pills.

Maswali yafuatayo yanatokana na mahojiano mafupi kuhusu unywaji wa pombe, utumiaji wa bidhaa mbalimbali za tumbako na madawa mengine ya kulevya. Nitaanza kukuuliza maswali yanayohusiana na maono yako kuhusu utumizi wa pombe, tumbako na madawa ya kulevya katika maisha yako au kwa muda wa miezi miwili iliyopita. Pombe, tumbako na madawa ya kulevya yanaweza kutumika kwa njia zifuatavyo: Kuvuta, kumeza, kunusa, au kutumika kama tembe.

	In your life have you used any of the following substances? **Je katika maisha yako umewahi kutumia bidhaifuatayo?**	NO (La)	YES (Ndiyo)
1.			
a.	Tobacco products (cigarettes, chewing tobacco, Cigara, Kiraiko)	0	3
b.	Beer Products (Tusker, Tuskermalt, Guinness, Senator, White cap)	0	3
c.	Wines (Fighter, Kenya cane(KC)	0	3
d.	Changaa'	0	3
e.	Karubu, Muratina	0	3
f.	Miraa/irungi, Khat, kangeta, /Mugoka, kuber,	0	3
g.	Other - specify:	0	3

If "No" to all items, stop interview.

(Kama hutumii madawa haya ya kulevya basi usiendelee kuuliza maswali.)

If "Yes" to any of these items, ask Question 2 for each substance ever used.

(Kama anatumia madawa haya basi uliza swali la pili kuhusu madawa yaliyotumika.)

2.	**In the past two months, how often have you used the substances you mentioned above** **Kwa muda wa miezi miwili iliopita umetumia bidha ifuatayo mara ngapi?**	(Sijawahi)	(Mara mojo au mara	(Mwezi mmoja)	(Kwa wiki)	(Karibu kila siku)
a.	Tobacco products (cigarettes, chewing tobacco, Cigara, Kiraiko)	0	2	3	4	6
b.	Beer Products (Tusker, Tusker malt, Guinness, Senator, White cap)	0	2	3	4	6
c.	Wines (Fighter, Kenya cane(KC)	0	2	3	4	6
d.	Changaa'	0	2	3	4	6
e.	Karubu, Muratina	0	2	3	4	6
f.	Miraa/irungi, khat, kangeta, Mugoka, Kuber,	0	2	3	4	6
g.	Other - specify:	0	2	3	4	6

"Never" to all items in Question 2, skip to Question 6. If any substances in Question 2

were used in the previous three months, continue with Questions 3, 4 & 5.

Ikiwa hujawahi kutumia madawa haya katika swali la pili, basi nenda moja kwa moja

hadi swali la sita. Kama umeshawahi kutumia madawa ya kulevya katika swali la pili

kwa muda wa miezi mawili basi endelea na swali la 3, 4, & 5.

	During the past two months, how often have you had a strong desire or urge to use the following drugs Kwa muda wa miezi miwili, ni mara ngapi ambapo umekuwa na hamu kubwa sana ya kutumia? MADAWA YAFUATAYO	Never (Sijawahi)	Once or twice (Mara mojo au mara mbili hivi)	Monthly (Mwezi mmoja)	Weekly (Kwa wiki)	Daily or almost daily (Karibu kila siku)
3.						
a.	Tobacco products (cigarettes, chewing tobacco, Cigara, Kiraiko	0	3	4	5	6
b.	Beer Products Tusker, Tuskermalt, Guinness, Senator, White cap)	0	3	4	5	6
c.	Wines (Fighter, Kenya cane(KC)	0	3	4	5	6
d.	Changaa'	0	3	4	5	6
e.	Karubu, Muratina	0	3	4	5	6
f.	Miraa/irungi, khat, kangeta, Mugoka, Kuber,	0	3	4	5	6
g.	Other - specify:	0	3	4	5	6
4.	During the past two, how often has your use of (FIRST DRUG, SECOND DRUG, ETC) led to health, social, legal or financial problems? Kwa muda wa miezi miwili, ni mara ngapi au ni vipi, ambavyo (DAWA YA KULEVYA YA FUATAYO imeweza kuathiri shida au matatizo yako kuhusu afya yako, uhusiano wako na watu, hali ya kuvunja sheria na hali yako ya kifedha?	Never (Sijawahi)	Once or twice (Mara mojo au mara mbili hivi)	Monthly (Mwezi mmoja)	Weekly (Kwa wiki)	Daily or almost daily (Karibu kila siku)

a.	Tobacco products (cigarettes, chewing tobacco, Cigara, Kiraiko	0	4	5	6	7
b.	Beer Products Tusker, Tuskermalt, Guinness, Senator, White cap)	0	4	5	6	7
c.	Wines (Fighter, Kenya cane(KC)	0	4	5	6	7
d.	Changaa'	0	4	5	6	7
e.	Karubu, Muratina	0	4	5	6	7
f.	Miraa/irungi, Khat, Kangeta, Mugoka, Kuber,	0	4	5	6	7
g.	Other-Specify	0	4	5	6	7

		Never (Sijawahi)	Once or twice (Mara mojo au mara mbili hivi)	Monthly (Mwezi mmoja)	Weekly (Kwa wiki)	Daily or almost daily (Karibu kila siku)
5.	**In the past two months, how often have you failed to do what was normally expected of you because of your use of the following drugs?** **Kwa muda wa miezi miwili, ni mara ngapi ambapo umeshindwa kufanya yale ulitakiwa kufanya kwa sababu ya kutumia MADAWA YAFUATAYO?**					
a.	Tobacco products (cigarettes, chewing tobacco, Cigara, Kiraiko	0	5	6	7	8
b.	Beer Products Tusker, Tuskermalt, Guinness, Senator, White cap)	0	5	6	7	8

c.	Wines (Fighter, Kenya cane(KC)	0	5	6	7	8
d.	Changaa'	0	5	6	7	8
e.	Karubu, Muratina	0	5	6	7	8
f.	Miraa/irungi, khat, kangeta, mugoka, kuber,	0	5	6	7	8
g.	Others-Specify	0	5	6	7	8

Answer Questions 6 and 7 for all substances ever used (i.e. those endorsed in Question 1)

(Jibu maswali 6 na 7 ikiwa umetumia madawa yote katika Swali la 1)

		No, Never (La, Sijawahi)	Yes, In the past 2 months Ndiyo, Kwa muda wa miezi miwili iliopita	Yes, but not in the past 2 months Ndiyo, lakini siyo kwa muda wa miezi miwili iliopita
6.	**Has a friend or relative or Care giver/group members <u>been of help in trying to help you control,reduce and stop the use of the following products in the past two months.</u>** **Je, kuna rafiki au mtu wa jamii yako au mtu mwingine yeyote ,mhudumu wako au kundi lako amabao amejitokeleza kukusaidia kudhibiti,Kupunguza ama kuwacha utumiaji wa bidha hizi**			
a.	Tobacco products (cigarettes, chewing tobacco, Cigara, Kiraiko	0	6	3
b.	Beer Products Tusker, Tusker malt, Guinness, Senator, White cap)	0	6	3
c.	Wines (Fighter, Kenya cane(KC)	0	6	3
d.	Changaa'	0	6	3
e.	Karubu, Muratina	0	6	3
f.	miraa/irungi, khat, kangeta, mugoka, kuber,	0	6	3

		No, Never (La, Sijawahi)	Yes, In the past 2 months Ndiyo, Kwa muda wa miezi miwili iliopita	Yes, but not in the past 2 months Ndiyo, la kini siyo kwa muda wa miezi miwili iliopita
g.	Other - specify:	0	6	3
7.	**During the past 2 months Have you ever tried to control, cut down or stop using the drugs mentioned below** **Kwa miezi miwili iliopita umeshawahi kujaribu au kujizuia au kupunguza ama kuwacha kutumia dawa za kulevya zilizo tajwa hapa chini**			
a.	Tobacco products (cigarettes, chewing tobacco, Cigara, Kiraiko	0	6	3
b.	Beer Products Tusker, Tusker malt, Guinness, Senator, White cap)	0	6	3
c.	Wines (Fighter, Kenya cane(KC)	0	6	3
d.	Changaa'	0	6	3
e.	Karubu, Muratina	0	6	3
f.	miraa/irungi, khat, kangeta, mugoka, kuber,	0	6	3
g.	Other - specify:	0	6	3

Appendix VI: BDI

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 and 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 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 has

  2 As I look back on my life, all I can see is a lot of failure

  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

5. 0 I don't feel particularly guilty

  1 I feel guilty a good part of the time

2   I feel quite 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 I am myself

    1   I am disappointed in myself

    2   I am disgusted with 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 weaknesses or mistakes

    2   I blame myself all the time for my faults

    3   I blame myself for everything bad that happens

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 kill myself if I had the chance

10. 0   I don't cry any more than usual

1   I cry more now than I sued 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 by things than I ever was

1   I am slightly irritated now than usual

2   I am quite annoyed or irritated a good deal of the time

3   I feel irritated all the time

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 my 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 more than I used to

3   I can't make decisions at all anymore

14. 0   I don't feel that I look any worse than I used to

1   I am worried that I am looking old or unattractive

2   I feel there are permanent changes in my appearance that make me look unattractive

3   I believe that I look ugly

15. 0   I can work about as well as before

1   It takes an 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't sleep well as usual

1   I don't sleep as well as I used to

2   I wake up 1-2 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 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, if any, lately

    1   I have lost more than five pounds

    2   I have lost more than ten pounds

    3   I have lost more than fifteen pounds

20. 0   I am no more worried about my health than usual

    1   I am worried about physical problems like aches, pains, upset stomach, or
Constipation

    2   I am very worried about physical problems and its hard to think of much
also

    3   I am so worried about my physical problems that I cannot think of
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 have almost no interest in sex

    3   I have lost interest in sex completely

Appendix VII: BDI (Swahili version)

1. 0   Sihisi huzuni

    1   Nahisi huzuni

    2   Ninahuzuni kila wakati na siwezi jiondoa

    3   Ninahuzuni na kukosa furaha hadi siwezi stahimili

2. 0   Mimi hasa sikati tamaa juu ya siku za usoni

    1.   Nahisi kukata tamaa juu ya siku za usoni

    2.   Nahisi sina chochote cha kutumaini

    3.   Nahisi siku za usoni hazina matumaini na kwamba mambo hayawezi

         boreka

3. 0   Sihisi kama aliyeshindwa

    1   Nahisi nimeshindwa zaidi kuliko mtu wa kawaida awezavyo

    2.   Ninapotizama nyuma katika maisha yangu, yote nionayo ni kushindwa

         kwingi

    3   Najihisi mwenyekushindwa kabisa kama mwanadamu

4. 0   Ninapata kuridhika sana kutokana na mambo kama nilivyokuwa

    1   Sifurahii mambo jinsi nilivyokuwa

    2   Sipati kuridhika halisi katika kitu chochote tena

    3   Siridhishwi au nimechoka na kila kitu

5. 0   Sihisi hasa mwenyehatia

   1   Najihisi mwenyehatia muda mwingi

   2   Najihisi mwenyehatia kiasi wakati mwingi

   3   Najihisi mwenyehatia wakati wote

6. 0   Sijihisi kuwa ninaadhibiwa

   1   Nahisi kwamba nawezaadhibiwa

   2   Natarajia kuadhibiwa

   3   Nahisi kwamba ninaadhibiwa

7. 0   Sijihisi kwamba ni mimi mwenyewe

   1   Nimekata tamaa juu yangu mwenyewe

   2   Nimeudhika juu yangu mwenyewe

   3   Najichukia

8. 0   Sijihisi kuwa mbaya zaidi kuliko mtu yeyote mwingine

   1   Mimi ni wa kujikosoa mwenyewe kwa udhaifu wangu au makosa

   2   Mimi hujilaumu mwenyewe wakati wote kwa ajili ya makosa yangu

   3   Mimi hujilaumu mwenyewe kwa kila kitu kibaya kifanyikacho

9. 0   Sina mawazo yoyote ya kujiua

   1   Nina mawazo ya kujiua, lakini siwezi yatekeleza

   2   Ningependa kujiua

   3   Ningejiua iwapo ningekua na nafasi

10. 0   Silii tena kuliko kawaida

      1   Ninalia zaidi sasa kuliko kuliko jinsi nilivyokua

      2   Ninalia wakati wote sasa

      3   Nilikuwa na uwezo wa kulia, lakini sasa mimi silii hata kama nataka

11. 0   Sikasirishwi kamwe na mambo kuliko jinsi nilivyokua

      1   Ninakasirika kiasi sasa kuliko kawaida

      2   Ninaudhika au nakasirika kiwango kingi cha muda

      3   Nahisi kukasirika wakati wote

12. 0   Sijapoteza hamu kwa watu wengine

      1   Nina upungufu wa hamu kwa watu wengine kuliko nilivyokuwa

      2   Nimepoteza wingi wa hamu yangu katika watu wengine

      3   Nimepoteza hamu yangu yote katika watu wengine

13. 0   Ninafanya maamuzi kuhusu vyema kama nilivyoweza

      1   Napuuza kufanya maamuzi zaidi ya nilivyokuwa

      2   Nina shida kubwa katika kufanya maamuzi zaidi ya nilivyokuwa

      4   Siwezi kufanya maamuzi hata kidogo tena

14. 0   Sijihisi kwamba ninakaa vibaya kuliko nilivyokuwa

      1   Ninawasiwasi kwamba ninakaa kuzeeka au kutopendeza

2 Nahisi kuna mabadiliko ya kudumu katika sura yangu yanayofanya nisiwe wa kupendeza

3 Naamini kuwa mimi kafanana vibaya

15. 0 Ninaweza fanya kazi kama awali

1 Inachukua juhudi za ziada ili kuanza kufanya kitu

2 Ninajishinikiza mwenyewe sana kufanya kitu chochote

3 Siwezi kufanya kazi yoyote kabisa

16. 0 Siwezi kulala vizuri kama kawaida

1 Silali vizuri kama nilivyo kuwa

2 Mimi huamka saa 1-2 mapema kuliko kawaida na ni vigumu kupata usingizi baadaye

3 Mimi huamka saa kadhaa mapema zaidi kuliko nilivyokuwa na siwezi rudi kulala

17. 0 Mimi sipati uchovu zaidi kuliko kawaida

1 Mimi hupata uchovu kwa urahisi zaidi kuliko nilivyokuwa

2 Mimi hupata uchovu kwa kufanya karibu kila kitu

3 Mimi nimechoka kufanya kitu chochote

18. 0 Hamu yangu sio mbaya zaidi kuliko kawaida

1 Hamu yangu si nzuri kama ilivyokuwa

2   Hamu yangu ni mbaya sana sasa

3   Sina hamu kabisa tena

19. 0   Sijapoteza uzito mwingi, kama ipo, siku za hivi karibuni

1   Nimepoteza zaidi ya paundi tano

2   Nimepoteza zaidi ya paundi kumi

3   Nimepoteza zaidi ya paundi kumi na tano

20. 0   Sina hofu zaidi kuhusu afya yangu kuliko kawaida

1.   Nina wasiwasi juu ya matatizo ya kimwili kama kuumwa, maumivu, tumbo, au kuvimba

2.   Nina wasiwasi sana kuhusu matatizo ya kimwili na nivigumu kufikiria zaidi pia

3.   Nina wasiwasi zaidi juu ya matatizo yangu ya kimwili kwamba siwezi fikiria kitu kingine chochote

21. 0   Sijaona mabadiliko yoyote ya hivi karibuni kwa hisia yangu katika ngono

1   Nimepunguza hisia ya ngono kuliko nilivyokuwa

2   Karibu sina hisia katika ngono

3   Nimepoteza hamu katika ngono kabisa

Appendix VIII: PCL-5

		Not at all	A little bit	Moderately	Quite a bit	Extremely
1	Repeated, disturbing, and unwanted memories of the stressful experience?	0	1	2	3	4
2	Repeated, disturbing dreams of the stressful experience?	0	1	2	3	4
3	Suddenly feeling or acting as if the stressful experience were actually happening again (as if you were actually back there reliving it)?	0	1	2	3	4
4	Feeling very upset when something reminded you of the stressful experience?	0	1	2	3	4
5	Having strong physical reactions when something reminded you of the stressful experience (for example, heart pounding, trouble breathing, sweating)?	0	1	2	3	4
6	Avoiding memories, thoughts or feelings related to the stressful experience?	0	1	2	3	4
7	Avoiding external reminders of the stressful experience (for example, people, places, conversations, activities, objects, or situations)?	0	1	2	3	4
8	Trouble remembering important parts of the stressful experience?	0	1	2	3	4
9	Having strong negative beliefs about yourself, other people or the world (for example having	0	1	2	3	4

	thoughts such as: I am bad, there is something seriously wrong with me , no one can be trusted , the world is completely dangerous)?					
10	Blaming yourself or someone else for the stressful experience or what happened after it?	0	1	2	3	4
11	Having strong negative feelings such as fear, horror, anger, guilt or shame?	0	1	2	3	4
12	Loss of interest in activities that you used to enjoy?	0	1	2	3	4
13	Feeling distant or cut off from other people?	0	1	2	3	4
14	Trouble experiencing positive feelings (forexample, being unable to feel happiness or have loving feelings for people close to you)?	0	1	2	3	4
15	Irritable behavior, angry outbursts or acting aggressively?	0	1	2	3	4
16	Taking too many risks or doing things that could cause you harm?	0	1	2	3	4
17	Being "superalert" or watchful or on guard?	0	1	2	3	4
18	Feeling jumpy or easily startled?	0	1	2	3	4
19	Having difficulty concentrating?	0	1	2	3	4
20	Trouble falling or staying asleep?	0	1	2	3	4

Appendix IX: PCL-5 (Swahili version)

		Hapa na kabis a	Kidogo	Kiasi	Kiasi cha wastan i	Sana
1	Kusumbuliwa mara kwa mara, na kumbukumbu zisizohitajika za matukio mabaya?	0	1	2	3	4
2	Kusumbuliwa mara kwa mara na ndoto za matukio mabaya?	0	1	2	3	4
3	Kuhisi ghafla au kutenda kana kwamba matukio ya kusumbua yalikuwa kweli yanatokea tena (kana kwamba ulikuwa kweli huko nyuma ndani ya matukio na unayarudia)?	0	1	2	3	4
4	Kuhisi kukasirika sana wakati kitu kinakukumbusha yale matukio?	0	1	2	3	4
5	Kuwa na hisia kali za kimwili wakati kitu kilikukumbusha yale matukio (kwa mfano, moyo kupiga sana, matatizo ya	0	1	2	3	4

	kupumua, jasho)?					
6	Kuepuka kumbukumbu, mawazo au hisia kuhusiana na matukio?	0	1	2	3	4
7	Kuepuka kukumbushwa na vitu vya nje kuhusu matukio (kwa mfano, watu, mahali, mazungumzo, shughuli, vitu, au hali)?	0	1	2	3	4
8	Matatizo ya kukumbuka sehemu muhimu ya matukio?	0	1	2	3	4
9	Kuwa na imani mbaya kujihusu, watu wengine au dunia (kwa mfano kuwa na mawazo kama vile: Mimi ni mbaya, kuna kitu chenye makosa kwangu, hakuna mtu anayeweza kuaminiwa, dunia ni hatari kabisa)?	0	1	2	3	4
10	Kujilaumu mwenyewe au mtu mwingine kwa ajili ya matukio au kile kilichotokea baada ya hilo?	0	1	2	3	4

11	Kuwa na wingi wa hisia mbaya kama vile kuogopa, hofu, hasira, hatia au aibu?	0	1	2	3	4
12	Kukosa hamu katika shughuli ambazo ulikuwa unafurahia?	0	1	2	3	4
13	Hisia za mbali au kujitenga kutoka kwa watu wengine?	0	1	2	3	4
14	Shida kupata hisia za matumaini (kwa mfano, kushindwa kupata furaha au kuwa na hisia za upendo kwa watu wa karibu nawe)?	0	1	2	3	4
15	Tabia za usumbufu, hasira shitukizi au kutenda kwa kulazimisha?	0	1	2	3	4
16	Kuchukua hatari nyingi sana au kufanya mambo ambayo yanayoweza kusababishia madhara?	0	1	2	3	4
17	Kuwa "tahadhari zaidi" au mwangalifu au kwenye ulinzi?	0	1	2	3	4
18	Hisia za kukosa utulivu au urahisi kushtuka?	0	1	2	3	4

19	Kuwa ugumu wa kuzingatia?	0	1	2	3	4
20	Shida kupata au kukaa usingizi?	0	1	2	3	4

Appendix X: KNH- UON ERC Ethical Clearance

UNIVERSITY OF NAIROBI
COLLEGE OF HEALTH SCIENCES
P O BOX 19676 Code 00202
Telegrams: varsity
Tel:(254-020) 2726300 Ext 44355

KNH-UON ERC
Email: uonknh_erc@uonbi.ac.ke
Website: http://www.erc.uonbi.ac.ke
Facebook: https://www.facebook.com/uonknh.erc
Twitter: @UONKNH_ERC https://twitter.com/UONKNH_ERC

KENYATTA NATIONAL HOSPITAL
P O BOX 20723 Code 00202
Tel: 726300-9
Fax: 725272
Telegrams: MEDSUP, Nairobi

Ref: KNH-ERC/A/254

1st July, 2019

Dr. Joseph Masila Makenga
Reg. No.H58/87298/2016
Dept. of Psychiatry
School of Medicine
College of Health Sciences
University of Nairobi

Dear Dr. Makenga

RESEARCH PROPOSAL: PREVALENCE OF DEPRESSION AND POST TRAUMATIC STRESS DISORDER AMONG PATIENTS WITH SUBSTANCE USE DISORDERS IN REHABILITATION CENTRES IN NAIROBI AND ITS ENVIRONS (P314/04/2019)

This is to inform you that the KNH- UoN Ethics & Research Committee (KNH- UoN ERC) has reviewed and **approved** your above research proposal. The approval period is 1st July 2019 – 30th June 2020.

This approval is subject to compliance with the following requirements:

a. Only approved documents (informed consents, study instruments, advertising materials etc) will be used.
b. All changes (amendments, deviations, violations etc.) are submitted for review and approval by KNH-UoN ERC before implementation.
c. Death and life threatening problems and serious adverse events (SAEs) or unexpected adverse events whether related or unrelated to the study must be reported to the KNH-UoN ERC within 72 hours of notification.
d. Any changes, anticipated or otherwise that may increase the risks or affect safety or welfare of study participants and others or affect the integrity of the research must be reported to KNH- UoN ERC within 72 hours.
e. Clearance for export of biological specimens must be obtained from KNH- UoN ERC for each batch of shipment.
f. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. (*Attach a comprehensive progress report to support the renewal*).
g. Submission of an *executive summary* report within 90 days upon completion of the study.
   This information will form part of the data base that will be consulted in future when processing related research studies so as to minimize chances of study duplication and/ or plagiarism.

Protect to discover

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Appendix XI: Clearance of Study from Rehabilitation Centres

JOSEPH MASILA MAKENGA
REG. NO H58/87298/2016
DEPT OF PSYCHIATRY
0727476760

4/07/2019

THE DIRECTOR
LIFEBRIDGE PSYCHIATRIC HOSPITAL & REHAB,
NAIROBI-KENYA.

Dear Sir,

LIFEBRIDGE HOSPITAL
P.O. Box 1079 - 00600,
NAIROBI
TEL: 0725 - 133 444

Approved proceed with
study. 5/07/2019.

REF: APPROVAL TO CONDUCT STUDY

I am a post graduate student at the University of Nairobi, Department of psychiatry, Reg No. H58/87298/2016. I wish to conduct a study at Life bridge Psychiatric Hospital & Rehab.

The study is titled *"Prevalence Of Depression And Post Traumatic Stress Disorder Among Patients With Substance Use Disorders In Rehabilitation Center In Nairobi And Its Environs"* This is in partial fulfillment for the degree master of medicine, psychiatry. My supervisors are Dr. Lincoln Khasakhala and Dr. Frederick Owiti from the department of Psychiatry, University of Nairobi.

The study will use a social demographic questionnaire, Becks depression inventory(BDI), The World Health Organization alcohol and substance involvement screening tool(WHO-ASSIST) and post traumatic stress checklist for DSM 5 (PCL-5).

I have already obtained approval from KNH-UON ethics and research committee (KNH-UON ERC).

For any enquiries concerning the study you can contact the KNH-UON ERC via Tel 020726300 ext 44355.

Yours Faithfully

Joseph Masila Makenga

JOSEPH MASILA MAKENGA
REG. NO H58/87298/2016
DEPT OF PSYCHIATRY
0727476760

4/07/2019

THE DIRECTOR
THE TEEN CHALLENGE KENYA REHABILITATION CENTRE,
KIAMBU-KENYA.

Dear Sir,

REF: APPROVAL TO CONDUCT STUDY

I am a post graduate student at the University of Nairobi, Department of psychiatry, Reg No. H58/87298/2016. I wish to conduct a study at The Teen Challenge Kenya Rehabilitation Centre.

The study is titled *"Prevalence of Depression and Post Traumatic Stress Disorder Among Patients with Substance Use Disorders in Rehabilitation Center in Nairobi And Its Environs"* This is in partial fulfillment for the degree Master of Medicine, psychiatry. My supervisors are Dr. Lincoln Khasakhala and Dr. Frederick Owiti from the department of Psychiatry, University of Nairobi.

The study will use a social demographic questionnaire, Becks depression inventory(BDI), The World Health Organization alcohol and substance involvement screening tool(WHO-ASSIST) and post-traumatic stress checklist for DSM 5 (PCL-5).

I have already obtained approval from KNH-UON ethics and research committee (KNH-UON ERC).

For any enquiries concerning the study you can contact the KNH-UON ERC via Tel 020726300 ext. 44355.

Yours Faithfully

Joseph Masila Makenga

Approved
20/7/2019

JOSEPH MASILA MAKENGA
REG. NO H58/87298/2016
DEPT OF PSYCHIATRY
0727476760

4/07/2019

THE MEDICAL SUPERINTENDENT,
MATHARI TEACHING AND REFERRAL HOSPITAL,
P.O BOX 40663-00100,
NAIROBI.

Dear Sir,

REF: APPROVAL TO CONDUCT STUDY

I am a post graduate student at the University of Nairobi, Department of psychiatry, Reg No. H58/87298/2016. I wish to conduct a study at Mathari Teaching and Referral Hospital.

The study is titled *"Prevalence Of Depression And Post Traumatic Stress Disorder Among Patients With Substance Use Disorders In Rehabilitation Center In Nairobi And Its Environs"* This is in partial fulfillment for the degree master of medicine, psychiatry. My supervisors are Dr. Lincoln Khasakhala and Dr. Frederick Owiti from the department of Psychiatry, University of Nairobi.

The study will use a social demographic questionnaire, Becks depression inventory(BDI), The World Health Organization alcohol and substance involvement screening tool(WHO-ASSIST) and post traumatic stress checklist for DSM 5 (PCL-5).

I have already obtained approval from KNH-UON ethics and research committee (KNH-UON ERC).

For any enquiries concerning the study you can contact the KNH-UON ERC via Tel 020726300 ext 44355.

Yours Faithfully

Joseph Masila Makenga

JOSEPH MASILA MAKENGA
REG. NO H58/87298/2016
DEPT OF PSYCHIATRY
0727476760

4/07/2019

THE DIRECTOR
MEDIVA WELLNESS CENTRE,
THIKA-KENYA.

Dear Sir,

REF: APPROVAL TO CONDUCT STUDY

I am a post graduate student at the University of Nairobi, Department of psychiatry, Reg No.
H58/87298/2016. I wish to conduct a study at Mediva Wellness Centre.

The study is titled *"Prevalence Of Depression And Post Traumatic Stress Disorder Among
Patients With Substance Use Disorders In Rehabilitation Center In Nairobi And Its Environs"* This
is in partial fulfillment for the degree master of medicine, psychiatry. My supervisors are Dr.
Lincoln Khasakhala and Dr. Frederick Owiti from the department of Psychiatry, University of
Nairobi.

The study will use a social demographic questionnaire, Becks depression inventory(BDI), The
World Health Organization alcohol and substance involvement screening tool(WHO-ASSIST)
and post traumatic stress checklist for DSM 5 (PCL-5).

I have already obtained approval from KNH-UON ethics and research committee (KNH-UON
ERC).

For any enquiries concerning the study you can contact the KNH-UON ERC via Tel 020726300
ext 44355.

Yours Faithfully

Joseph Masila Makenga

LILY MEDIHEALTH
MEDIVA WELLNESS CENTRE   Approved
Date:............17 |7|19

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JOSEPH MASILA MAKENGA
REG. NO H58/87298/2016
DEPT OF PSYCHIATRY
0727476760

4/07/2019

THE DIRECTOR
THE CARE-TECH REHAB,
KIAMBU-KENYA.

Dear Sir,

Go on with study.
08/07/2019

REF: APPROVAL TO CONDUCT STUDY

I am a post graduate student at the University of Nairobi, Department of psychiatry, Reg No. H58/87298/2016. I wish to conduct a study at The Care-tech Rehab.

The study is titled *"Prevalence of Depression and Post Traumatic Stress Disorder Among Patients with Substance Use Disorders in Rehabilitation Center in Nairobi And Its Environs"* This is in partial fulfillment for the degree Master of Medicine, psychiatry. My supervisors are Dr. Lincoln Khasakhala and Dr. Frederick Owiti from the department of Psychiatry, University of Nairobi.

The study will use a social demographic questionnaire, Becks depression inventory(BDI), The World Health Organization alcohol and substance involvement screening tool(WHO-ASSIST) and post-traumatic stress checklist for DSM 5 (PCL-5).

I have already obtained approval from KNH-UON ethics and research committee (KNH-UON ERC).

For any enquiries concerning the study you can contact the KNH-UON ERC via Tel 020726300 ext. 44355.

Yours Faithfully

Joseph Masila Makenga

JOSEPH MASILA MAKENGA
REG. NO H58/87298/2016
DEPT OF PSYCHIATRY
0727476760

4/07/2019

THE DIRECTOR
THE SOBRIETY SOLUTIONS CENTRE,
KAREN-NAIROBI.

Dear Sir,

REF: APPROVAL TO CONDUCT STUDY

I am a post graduate student at the University of Nairobi, Department of psychiatry, Reg No. H58/87298/2016. I wish to conduct a study at The Sobriety Solutions Centre.
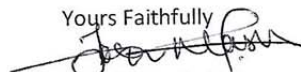
The study is titled *"Prevalence of Depression and Post Traumatic Stress Disorder Among Patients with Substance Use Disorders in Rehabilitation Center in Nairobi And Its Environs"* This is in partial fulfillment for the degree Master of Medicine, psychiatry. My supervisors are Dr. Lincoln Khasakhala and Dr. Frederick Owiti from the department of Psychiatry, University of Nairobi.

The study will use a social demographic questionnaire, Becks depression inventory(BDI), The World Health Organization alcohol and substance involvement screening tool(WHO-ASSIST) and post-traumatic stress checklist for DSM 5 (PCL-5).

I have already obtained approval from KNH-UON ethics and research committee (KNH-UON ERC).

For any enquiries concerning the study you can contact the KNH-UON ERC via Tel 020726300 ext. 44355.

Yours Faithfully

Joseph Masila Makenga

JOSEPH MASILA MAKENGA
REG. NO H58/87298/2016
DEPT OF PSYCHIATRY
0727476760

4/07/2019

THE DIRECTOR
THE RETREAT REHAB CENTRE,
NAIROBI-KENYA.

Dear Sir,

REF: APPROVAL TO CONDUCT STUDY

I am a post graduate student at the University of Nairobi, Department of psychiatry, Reg No. H58/87298/2016. I wish to conduct a study at Retreat Rehab Centre.
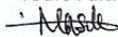
The study is titled *"Prevalence Of Depression And Post Traumatic Stress Disorder Among Patients With Substance Use Disorders In Rehabilitation Center In Nairobi And Its Environs"* This is in partial fulfillment for the degree master of medicine, psychiatry. My supervisors are Dr. Lincoln Khasakhala and Dr. Frederick Owiti from the department of Psychiatry, University of Nairobi.

The study will use a social demographic questionnaire, Becks depression inventory(BDI), The World Health Organization alcohol and substance involvement screening tool(WHO-ASSIST) and post traumatic stress checklist for DSM 5 (PCL-5).

I have already obtained approval from KNH-UON ethics and research committee (KNH-UON ERC).

For any enquiries concerning the study you can contact the KNH-UON ERC via Tel 020726300 ext 44355.

Yours Faithfully

Joseph Masila Makenga

DR. JOSEPH MASILA MAKENGA

PSYCHIATRY RESIDENT

CONTACT

+254727476760

Masilajoe@gmail.com

P.O. BOX 56-90300 Makueni

EDUCATION

UNIVERSITY

MBCHB

Moi University
2005-2010

SECONDARY

Mbooni Boys High School
1999-2002

SKILLS

ACLS (advanced cardiac life support)
BCLS (basic cardiac life support)
Bemoc (basic emergency obstetric care)

PROFILE

Medical officer with 8 years of experience practicing medicine in Kenya

EXPERIENCE

MEDICAL OFFICER

Makueni County Referral Hospital 2014-2016

- Performed administrative duties as assigned
- Offered curative, diagnostic and preventive services
- Developed SOPs and protocols for use

MEDICAL OFFICER

Moyale District Hospital 2013-2014

- Clerking patients, offered family planning services
- Offered curative, diagnostic and preventive services
- Developed SOPs and protocols for use

MEDICAL OFFICER

Isiolo Mater Care Maternity 2012-2013

- Offered curative, diagnostic and preventive services
- Participated in community health and development programs

MEDICAL OFFICER INTERN

Kitui County Referral Hospital 2011-2012

- Offered curative, diagnostic and preventive services