PREVALENCE OF ALCOHOL USE DISORDER AND DEPRESSION IN PATIENTS ATTENDING COMPREHENSIVE CARE CENTRE, KENYATTA NATIONAL HOSPITAL

A DISSERTATION IN PART FULFILLMENT FOR THE AWARD OF THE DEGREE OF MASTER OF SCIENCE IN CLINICAL PSYCHOLOGY

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2ND JUNE, 2015

Declaration

By Student:

I declare that this dissertation is my original work and has not been submitted for examination in any other university.

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Acknowledgements

Dedication

This dissertation is dedicated to my beloved family for the inspiration they gave me in my early stages of development.

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Acronyms and Abbreviations

AIDS - Acquired Immuno Deficiency Syndrome

AUD - Alcohol Use Disorder

AUDIT - Alcohol Use Disorder Identification Test

BDI - Becks Depression Inventory

CCC - Comprehensive Care Centre

DSM-V - Diagnostic Statistical manual

HIV - Human Immunodeficiency Virus

KNH - Kenyatta National Hospital

MDD - Major Depressive Disorder

PLWHA - People Living With HIV & AIDS

SPSS - Statistical Package for Social Sciences

WHO - World Health organization

KShs - Kenya Shillings

<div align="center">**Definition of terms**</div>

1.0 Concept of Depression

1.1 Definition of Major Depression Disorder

According to the Diagnostic and Statistical Manual of Mental Disorders V (DSM-V), major depressive disorder (MDD) is defined as having an abnormal mood or a loss of all interest or pleasure which drastically interferes (American with Psychiatric Association, 2013). Additionally, five of the following symptoms must be present during the depressed two weeks: appetite or weight change, unusual weight loss or a loss of appetite, uncommon weight gain or an increase in appetite; sleep disturbances, either insomnia or hypersomnia; activity disturbance; a general lack of energy; unusual guilt or self-reproach; trouble concentrating or indecisiveness; and thoughts of death or suicide. Depression cannot be due to physical illness, normal bereavement or bipolar disorder (American Psychiatric Association, 2013).

1.2 Alcohol use disorders

Alcohol use disorders (AUDs) are prevalent in persons living with human immunodeficiency virus (HIV), acquired immunodeficiency syndrome (AIDS), (PLHWA), and is associated with adverse health effects. Alcohol has a direct impact on risk behaviors by impairing judgment and cognition and by disinhibiting behavior, thereby potentially increasing the likelihood of unprotected sex and other risky behaviors (Fritz et al., 2010). Little is known about AUDs among people attending HIV services in sub-Saharan Africa. Alcohol use disorders caused by the ingestion of alcohol over a period of time lead to physical or other psychological health problems, personal relationships, family problems, school or work performance problems. Alcohol use disorders include alcohol dependence, alcohol abuse, alcohol intoxication, and alcohol withdrawal. Alcohol dependence and harmful alcohol use are recognized as mental

health disorders by the World Health Organization (WHO, 2002). Estimates of lifetime prevalence for AUD (including alcohol dependence and alcohol abuse) range from 8.3% to 30.3% (Grant et al., 2005, Kessler et al., 2005a).

AUDs can be categorized as harmful use, hazardous use or dependence (Babor, 2001). Harmful alcohol use is characterized by an alcohol consumption pattern that is within the individual's control but which is causing physical or mental problems and may also have social consequences (Babor, 2001). Hazardous use of alcohol considers both the increased risk of harmful physical, mental or social consequences for the user and harm to others. Dependent alcohol drinking is characterized by alcohol use that takes over a person's life to the extent that they have a physiological or psychological need to continue drinking. Dependence is the most severe is associated with many social, psychological and physical health problems (Mathers et al., 2000)

ABSTRACT

Alcohol use disorders (AUDs) are prevalent in persons living with human immunodeficiency virus (HIV), acquired immunodeficiency syndrome (AIDS), (PLHWA), and is associated with adverse health effects. In sub-Sahara Africa, little is known about AUDs among people attending HIV services.

Methods

A descriptive cross-sectional study carried out among PLHWA who attended HIV services at the Comprehensive Care Centre, KNH in September and October 2014. The World Health Organization's Alcohol Use Disorders Identification Tool (AUDIT) was used to measure probable hazardous, harmful and dependent use of alcohol ('alcohol use disorders'), and the BDI to measure the intensity, severity and depth of depression in respondents with psychiatric diagnosis.

Statistical Analysis

Associations between AUDs and other variables were explored using logistic regression analysis. All variables associated with AUDs with a p value <0.05 were included in the final multivariable model.

Results

The overall prevalence of AUDs was 14%, with hazardous use and harmful use 5.5% and alcohol dependence accounting for 8.5%, respectively. Alcohol abuse was associated with severity of depression (p=0.024). Male gender, employment status and income level had statistically significant associations with alcohol abuse. On bivariate analysis, we found that age, marital status, education, housing, HIV testing site, test results disclosure method and post-test care did not have statistically significant associations with alcohol abuse.

AUDs were associated with male gender (OR=10, 95% CI of OR [3.6 – 28.3], p<0.0001) and severity of depression (OR=5.5, 95% CI of OR [2.1 – 14.3], p<0.0001).

Conclusion

These results indicate that there is a significant burden of AUDs and depressive disorders among HIV-infected individuals attending the specialized CCC. The study indicated that men were more vulnerable to AUDs and need special services to address the problem. The high prevalence of AUDs detected in our study highlights the need to integrate delivery of effective methods in which standardized assessment and treatment practices may be adapted to better address alcohol use disorders in CCC, patients.

CHAPTER ONE

1.0 Introduction

The Global Burden of Disease Report states that globally, 70 million people suffer from alcohol dependence (World Health Report, 2001). Alcohol abuse is prevalent among alcoholic HIV-infected individuals, and is associated with adverse health effects (Ekott & John, 2010). Research in Sub-Sahara Africa confirms an association between alcohol use and sexual risks for HIV acquisition, based on a high prevalence of hazardous alcohol use in the general population samples and an association with HIV sexual transmission in those samples (Kalichman et al., 2007). Alcohol has a direct impact on risk behaviors by impairing judgment and cognition and by disinhibiting behavior, thereby potentially increasing the likelihood of unprotected sex and other risky behaviors. In addition, alcohol-related outcome expectancies, perceived social norms, and other beliefs can influence behavior more indirectly.

In Kenya, alcohol consumption frequently occurs in settings (e.g., bars, clubs, and informal drinking places) where unprotected sex with several partners is likely to occur (Kalichman et al. 2007b). Alcohol drinking is associated with risky sexual behaviors. Mackenzie and Kiragu in 2007 reported that in a Kenya, drinkers were four times more likely to have multiple sexual partners than nondrinkers. Other studies found that alcohol-serving establishments often are the places where sex partners meet, resulting in the formation of "sexual networks" in which HIV can spread rapidly (Chersich and Rees 2010; Weir et al. 2003). Further, alcohol dependence may lead to trading sex for drinks, as has been reported in South Africa (Kalichman et al. 2007a).

In the Global Burden of Disease Report, one person in every four will be affected by a mental disorder at some stage of life. Depression was the fourth leading cause of disease burden

among all diseases and accounted for 4.4% of the total Disability Adjusted Life Years (DALYs) (World Health Report, 2001).The report further predicts that, within the next 20 years depression will have risen to second place.

Depression is a distressing and impairing condition which negatively affects a variety of self-care behaviors needed for optimal management of HIV disease (Rabkin, 2008). The frequency of depression in PLWHA vary between 20% and 79%, depending on the population studied, the period investigated, and the tools used to define the patients (Mello & Malbergier, 2001). It is paramount that the assessment of depression in people living with HIV/AIDS must be carried out carefully considering different stages of the disease, because some challenging physical symptoms can dismiss depression indicators (Malbergier & Schöffel, 2001).

Major depressive disorder (MDD) is characterized by a combination of symptoms that interfere with a person's ability to work, sleep, study, eat, and enjoy once-pleasurable activities. Major depression is disabling and prevents a person from functioning normally. The estimated prevalence of major depressive disorder in the general population is approximately 10% to 25% for women and from 5% to 12% for men. Projections indicate that by the year 2020, major depression will be the second largest cause of disability and death worldwide (DSM IV TR, 2000).

1.1 Background
World Health Organization (WHO) has ranked depression fourth in a list of the most urgent health problems worldwide (Kaplan & Saddock, 2005). Depressive disorders are estimated to occur in nearly half of HIV-infected individuals worldwide (Nakimuli-Mpungu, et al. 2011). Major depressive disorder in people living with HIV/AIDS (PLWHA) is common and may be associated with substance use (Dixit & Crum RM, 2000). Psychopathology like depression

and substance use can increase hazardous sexual behavior and in turn increase the chance of spreading HIV (Ostrow D.G. et al 2009).

Alcohol use is deeply embedded in many societies, and about 2000 million people drink alcohol in most parts of the world (Babor, et al., 2003). Public health problems associated with alcohol consumption have reached alarming proportions, and alcohol has become one of the most important risks to health globally; it is the leading risk factor in developing countries with low mortality rates and ranks third in developed countries (The world health report 2002).

1.2 Rationale

Myer et al., (2009), states that mental health disorders and human immunodeficiency virus (HIV) have a profound impact on public health in sub-Saharan Africa. However, limited data on the interaction between major depressive disorders (MDDs), alcohol use disorders (AUDs) and HIV is found in the region (Collins et al., 2006).

Causal relationships between mental disorders and HIV are complex (Myer et al., 2009). According to Babor, Caetano and Casswell et al (2003), the use of alcohol is known to be associated with an increased risk of unsafe sexual behavior. Given the widespread harmful use of alcohol in many countries with a high incidence and prevalence of HIV, levels and patterns of alcohol consumption may substantially influence HIV spread in populations. Ekott & John, (2010), states that, countries with high prevalence of HIV have shown a positive correlation between HIV and alcohol consumption, with a prevalence of HIV infection among people with alcohol-use disorders higher than in the general population. Conversely diagnosis with HIV increases risk of depression and alcohol abuse (WHO, 2008).

Reports based on clinical observation or medical record reviews indicate high rates of depressive symptoms among those infected with HIV or who have AIDS (Nakimuli et al 2011). Depression can arise and increase during different stages of HIV, for example, immediately after testing positive or after many years of living with HIV (Holder et al., 2006). Regardless of the fact that mental health problems are poorly recognized by clinicians, some HIV infected patients with mental problems will seek help at institutions for mental health (Pence et al, 2012). Scholars have found that HIV programs need to integrate mental health (Freeman et al. 2007) and include assessment of mental health disorders and their appropriate management (WHO, 2008).

The aim of the study was to determine the prevalence of alcohol use disorder and depression in patients attending the comprehensive care clinic in Kenyatta National Hospital.

1.3 Problem Statement

Depression is highly prevalent among PLWHA (Malbergier 2006) although widely unrecognized (Asch et al., 2003). Unfortunately, when depression is clinically recognized, the condition goes untreated (Weaver et al., 2008). Factors that contribute to this high prevalence of depression symptoms among PLWHA attending CCC may be due to alcohol use (Mackenzie, et al 2008). Apart from depression, other alcohol use disorders caused by the ingestion of alcohol over a period of time leading to physical or other psychological health problems, personal relationships, family problems, school or work performance problems. Alcohol use disorders include alcohol dependence, alcohol abuse, alcohol intoxication, and alcohol withdrawal. Alcohol dependence and harmful alcohol use are recognized as mental health disorders by the World Health Organization (WHO, 2002). Estimates of lifetime prevalence for AUD (including alcohol dependence and alcohol abuse) range from 8.3% to 30.3% (Grant *et al.*, 2005, Kessler *et al.*, 2005a). Most organs in the body can be affected by

the toxic effects of alcohol, resulting in more than 60 different diseases (Ofori-Adjei *et al.*, 2007). Acute and chronic heavy drinking can contribute to a wide range of social problems including domestic violence and marital breakdown, child abuse and neglect, absenteeism and job loss (Drummond, 2005). Misuse of alcohol is one of the leading causes of morbidity and mortality, resulting in over 107, 000 alcohol-related deaths every year (Fernandez, Hartman, & Olshaker, 2006). Alcohol misuse has been linked with liver disease, peripheral neuropathy, insomnia, seizures, poor nutrition, injuries, and hospitalization (St John, Montgomery, & Tyas, 2009). Alcohol dependence is a major cause of mortality and is associated with psychiatric conditions, neurologic impairment, cardiovascular disease, liver disease, and malignant neoplasms. Psychiatric conditions associated with alcohol dependence include major depression, dysthymia, mania, hypomania, panic disorder, phobias, generalized anxiety disorder, personality disorders, any drug use disorder, schizophrenia, and suicide (Schuckit MA, 2009). Psychiatric comorbidity, in turn, is associated with alcohol-related symptoms of greater severity. Excessive alcohol consumption causes brain damage. Up to 41% of suicides are attributable to alcohol and 23% of people who engage in deliberate self-harm are alcohol dependent (Demirbas et al., 2003). As a result of these implications, alcohol misuse is one of the costliest public health problems in the United States (Williams, et al., 2006). In Kenya, a study conducted to establish patterns of substance abuse in patients admitted in general medical facilities confirmed the overall alcohol user rate was 25.1%. All patients who used alcohol exhibited pathological use, which bordered from harmful use to dependence (Ndeti et al., 2009). It is for this reason that this study sought to investigate the prevalence of alcohol use disorder and depression in patients attending Comprehensive Care Centre (CCC) in Kenyatta National Hospital.

1.4 Research question

The research questions were as follows:-

"What is the prevalence of alcohol use disorder and depression in patients attending Comprehensive Care Centre (CCC) in Kenyatta National Hospital?

1.5 Objective

1.5.1 Broad Objective

The objective of the study was to determine the prevalence of alcohol use disorder and depression in patients attending Comprehensive Care Centre (CCC) in Kenyatta National Hospital (KNH).

1.5.2 Specific Objectives were:-

i.   To determine the social demographic characteristics in patients attending CCC at KNH

ii. To estimate the prevalence of alcohol use disorder in patients attending CCC at KNH.

iii. To determine prevalence of depression in CCC patients

iv. To determine the relationship between Social demographic, alcohol use disorder and depression in patients attending CCC, in KNH

1.6 Scope of the study

The study was carried out at KNH in the Comprehensive Care Centre. The sample was collected from a population of patients aged between 18-60 years. The study took a period of one month.

1.7 Conceptual Framework

This study was based on the following conceptual framework. The framework comprised of cofounders, predictor, and outcome variables. The cofounders were believed to be associated with both the predictor as well as the outcome and there was need to adjust for them as we elicited the relationship between alcohol use and depression among PLWHA.

1.7.1 Relationship between the Variables

Presence of alcohol use disorder or depression was associated with a double risk of either disorder. There is a moderate association between the two. Causal relationship between Alcohol use disorder (AUD) and depression has been attributed to AUD causing depression or depression causing AUD (Bolton and Sareen, 2009); in the latter the person uses alcohol to relieve the depressive symptoms. In addition there may be a reciprocal causal relationship where the presence of alcohol use raises the possibility of developing the other disorder (Bazargan-Hejazi et al., 2008). Individuals, who drink alcohol to reduce emotional stress, may be self-medicating themselves with alcohol (Grant et al., 2009), and a link has been shown where depression predicted alcohol use disorder and alcohol use disorder predicted depression (Marmorstein, 2009).

Depression is a distressing and impairing condition which negatively affects a variety of self-care behaviors needed for optimal management of HIV disease. The frequency of depression in PLWHA vary between 20% and 79%, depending on the population studied, the period investigated, and the tools used to define the patients. Alcohol abuse is prevalent among alcoholic HIV-infected individuals, and is associated with adverse health effects (Ekott & John, 2010). Conversely diagnosis with HIV increases risk of depression and alcohol abuse (WHO, 2008). Research in Sub-Sahara Africa confirms an association between alcohol use and sexual risks for HIV acquisition, based on a high prevalence of hazardous alcohol use in the general population samples and an association with HIV sexual transmission in those samples (Kalichman et al., 2007). Alcohol has a direct impact on risk behaviors by impairing judgment and cognition and by disinhibiting behavior, thereby potentially increasing the likelihood of unprotected sex and other risky behaviors. In addition, alcohol-related outcome expectancies, perceived social norms, and other beliefs can influence behavior more indirectly.

In Kenya, alcohol consumption frequently occurs in settings (e.g., bars, clubs, and informal drinking places) where unprotected sex with several partners is likely to occur (Kalichman et al. 2007b). Alcohol drinking is associated with risky sexual behaviors. Mackenzie and Kiragu (2007) reported that in Kenya, drinkers were four times more likely to have multiple sexual partners than nondrinkers. Other studies found that alcohol-serving establishments often are the places where sex partners meet, resulting in the formation of "sexual networks" in which HIV can spread rapidly (Chersich and Rees 2010; Weir et al. 2003).

Gender and alcohol consumption

Gender differences in alcohol consumption and attention to the ways that such gender differences both cut across are influenced by cultural differences (Van, 2005). Male drinkers consume larger quantities of alcohol than female drinkers do, and male drinkers experience more behavioral problems related to their drinking than female drinkers do (Nolen, 2004). Data from community samples suggest that men are more likely to use alcohol as a means of coping with depression than women, but that women may be more vulnerable to depressive symptoms associated with heavy alcohol use (Nolen-Hoeksema, 2004). Another factor is the female physiology, women's lack of power to negotiate sexual relationships with male partners, especially in marriage, and the gendered nature of poverty. Inequities in gender run parallel to inequities in income and assets. Thus, women are more vulnerable to HIV/AIDS infection (Walker, 2004).

Age

Use of alcohol at an early age is associated with future alcohol-related problems (DeWit et al., 2000). Alcohol misuse and alcohol use disorders in adolescents are associated with many other mental and physical disorders. Alcohol use disorders include risk-taking behaviors, such as sexual risk-taking and suicide attempts. Psychiatric conditions most likely to co-occur with

alcohol use disorders include mood disorders, particularly depression and anxiety disorders among others (Windle, 2004). Studies conducted in different parts of Africa, including Kenya and Ethiopia, have shown that most youths indulge in alcohol and risky sexual behavior at an early age, often with little regard to the possible consequences (Govindasamy, 2002). Young people, particularly girls and young women, aged 15–24 are at high risk for acquiring HIV in sub-Saharan Africa and account for 45% of new infections (UNAIDS, 2008). This is due to child marriages, to older husbands who have had prior sexual partners or who are in polygamous marriages and who transmit HIV to the young girls (Mathur, 2003).

Education

The more income people have, the more educated they are and the higher their social status or class, the more likely they are to drink alcoholic beverages (Holder, 1998). They are also more likely to drink if they live in certain countries or regions. A study conducted in India, Radhakrishna et al reported that individuals with low education were more likely to be infected with HIV (Radhakrishna, 2007). In a study in Zambia, however, Gabrysch et al reported that high education was a risk factor for HIV infection (Gabrysch, 2008).

Social economic status

Low socioeconomic status is generally associated with high psychiatric morbidity, disability, and poor access to health care (Andrade, 2000). Where comparable epidemiologic studies have been carried out, the lowest educational group had a higher prevalence of psychiatric morbidity. Poorer coping styles, ongoing life events, stress exposure, and weaker social support are some examples of psychiatric risk factors that are more prevalent in lower socioeconomic status groups (Turner et al., 2000). Studies of HIV+ adults and employment have found comparably low success rates (13%−16%) in returning to permanent paid employment (Goldman, 2004).

Isolation

Loneliness and social exclusion are major issues for those with mental illness. Individuals may develop alcoholism as a result of significant life changes such as the death of a partner, loss of job or relationship breakdown. This individual finds comfort in drinking alcohol which he believes is his closest friend. Isolation may precede problems which lead to depression (Cattan, White, Bond, & Learmouth, 2005).

Grief

Grief can also trigger clinical depression. When this occurs, the grieving person may start to feel hopeless or helpless, experience persistent fatigue, have difficulties sleeping and find it hard to concentrate. Depression also increases the risk of suicidal thoughts or actions. Unresolved grief and depression can make a person more vulnerable to developing a alcohol abuse problem. Someone unable to work through their feelings of loss in a healthy way may self-medicate, turning to alcohol or drugs. Abusing alcohol or drugs creates negative emotions and conflicts that make it harder to work through grief in a healthy way.

General medical conditions and alcohol abuse and depression

Medical disorders may contribute biologically to depression (NIMH, 2009). Medically ill people may become clinically depressed as a psychological reaction to the prognosis, the pain and/or incapacity caused by the illness or its treatment. Though occurring together, depression and a general medical disorder may be unrelated (NIMH, 2009). Depression occurs in 40 to 65 percent of patients who have experienced a heart attack, and in 18 to 20 percent of people who have coronary heart disease, but who have not had a heart attack (Nunes, 2004). Research shows that one in three depressed people also suffer from some form of substance abuse or dependence (NIMH, 2009).

Co-occurring mental

Mental and substance use conditions often co-occur. In this case, individuals with substance use conditions often have a mental health condition at the same time and vice versa. Those

diagnosed with mental health disorders often use substances to feel better. The use of alcohol while engaging in sexual activities among patients with severe co-occurring conditions was found to predict HIV-risk sexual behavior (Devieux et al., 2007).

Patients with personality disorder had a greater likelihood of more lifetime depressive episodes than any other co-occurring disorders. A cohort study of depression with co-occurring disorders was assessed in clinical interviews. The study concluded that 79 percent of patients with major depressive disorder suffered from one or more co-occurring mental conditions. Anxiety disorder was present in 57 percent of the people diagnosed, personality disorders were present as a co-occurring illness in 44 percent of subjects, and substance abuse disorder, including alcohol, was diagnosed along with major depressive disorder in 25 percent of clients (Melartin, et al, 2002).

Violence/Abuse

Violence, physical abuse and sexual abuse histories have been related to increases in HIV-risks sexual behavior within the general population (Bensley, Van Eenwyk, & Simmons, 2000). Children with documented cases of physical and sexual abuse (and neglect) histories were found to engage in HIV-risk sexual behavior 30 years later at nearly three times the rate of matched controls in one longitudinal study (Wilson & Widom, 2011).

Figure 1: Conceptual Framework diagram

Predictor
Alcohol use

Outcome
Depression

Confounders
Gender
Age
Education
Socioeconomic status
Isolation
Grief
General medical condition
Co-occurring disorders
Abuse/Violence
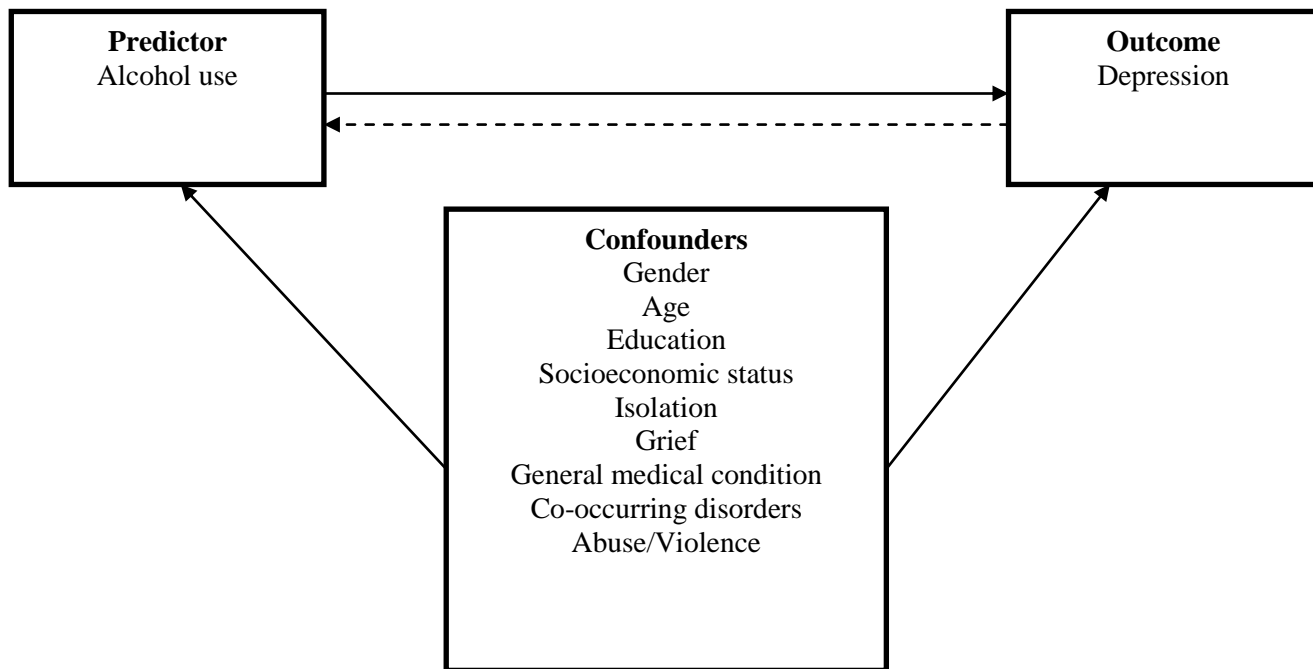
CHAPTER TWO: LITERATURE REVIEW

This section discussed literature review related to the study. It focused on alcohol use disorders and depression. The study intended to illuminate the experience of patients attending Comprehensive Care Centre, Kenyatta National Hospital (KHN).

2.1 Overview of Alcohol Use and Depression

It is estimated by the World Health Organization that up to 340 million people worldwide will experience depression (Harris, 2004). Within the United States, almost 18 million people have had a major depressive episode (National Institute of Mental Health). Data for the prevalence of MDD has varied widely due to differences in instrument measures (Hasin, et al., 2005). Based on the Epidemiologic Catchment Area (ECA), the prevalence of depression is 1.7% to 3.4% for 12-month and 3.0% to 5.9% for lifetime (Kessler, et al., 2003). The National Comorbidity Survey (NCS) found current rates of the disorder at 8.6% and for lifetime rates, 14.9% (Hasin, et al., 2005). Despite differences in prevalence rates, both the ECA and NCS concurred that MDD is common within the United States (Hasin, et al., 2005; Kessler, et al., 2003).

The prevalence of depression and alcohol use disorders (AUD) has been demonstrated in a number of researches (Grant and Harford, 1997). Depression in an alcohol-dependent person has been reported to not only lower the resolve to resisting alcohol use, but may also lead to use of alcohol to relive the depressive symptoms (Hasin and Grant, 2002). It is important to understand the significance of co-occurrence of depression and alcohol use disorders since this may explain why majority of cases relapse after treatment for alcohol dependence (Hasin and Grant, 2002). In addition it may explain why antidepressants have been shown to moderately benefit patients with both depression and alcohol use disorders (Nunes and Levin, 2004).

In Kenya, a study by Ndetei et al., (2008) showed that there was positive correlation between major depressive illness, panic disorder, and alcohol abuse among patients admitted at the main referral psychiatric hospital. Although the co-occurrence of depression and alcohol use disorders has been confirmed by several studies, the relationship between the two disorders has been difficult to describe (Davidson, 2005). This co-occurrence is at prevalence rate of 16%−68% (Halikas et al., 2001). Studies have attempted to differentiate between depressed and non-depressed alcohol-dependent persons with particular focus on the participant's level of alcohol dependence, demographic characteristics, or illness-related variables. It has been shown that depression is more related to the current alcohol drinking episode than lifetime diagnosis of depression (Dackis et al., 2006). Depression diagnosed in the current episode of alcohol dependence normally remits after 2 weeks of detoxification and abstinence and falls to normal range within 3 weeks (Dackis et al., 2006). The rapid recovery is in contrast to the slower (17 weeks) recovery from a major depression (Coryell et al., 2001). This may imply that depression in alcohol dependence is as a result of effects of chronic alcohol intoxication and is related to the recent episode of drinking.

There are two possible explanations for the association between alcohol use disorders and major depression; firstly it may be that both disorders have common underlying genetic and environmental factors that jointly increase the risk of both disorders. Secondly, the two disorders may have a causal effect with each disorder increasing the risk of developing the other. A number of studies have found evidence of a persistent association between alcohol use disorders and major depression, even after controlling for confounding factors (Kendler et al., 2003). Flensborg-Madsen et al. in a prospective study showed that the causal role of alcohol use disorders in major depression was stronger than the causal role of major depression in alcohol use disorder (Flensborg-Madsen et al., 2009).

Literature suggests that the more a person drinks the more they are likely to develop major depression (Boden and Fergusson, 2011). Presence of alcohol use disorder or major depression is associated with a double risk of either disorder. There is a moderate association between the two. Causal relationship between Alcohol use disorder (AUD) and depression has been attributed to AUD causing depression or depression causing AUD (Bolton and Sareen, 2009); in the latter the person uses alcohol to relieve the depressive symptoms. In addition there may be a reciprocal causal relationship where the presence of alcohol use raises the possibility of developing the other disorder (Bazargan-Hejazi et al., 2008). Individuals, who drink alcohol to reduce emotional stress, may be self-medicating themselves with alcohol (Grant et al., 2009), and a link has been shown where depression predicted alcohol use disorder and alcohol use disorder predicted depression (Marmorstein, 2009).

The causal effect of AUD leading to depression implies that some cases of depression resolve after treatment of alcohol dependence (Baker et al., 2010). Persons that use alcohol to relieve depressive symptoms may require treatment for depression to achieve full remission after alcohol use disorder treatment (Angold, et al., 2002). Various studies have shown both a metabolic and neurophysiological link between alcohol use and depression (Kelly, et al., 2010). While some studies have reported gender differences in the link between alcohol use disorders and depression (Sjöholm, et al., 2010), others have not (Fergusson, 2009). There is no published data from Kenya on the association between alcohol use disorders and depression.

2.1.1 Depression and Substance Abuse

Davis et al. (2008) presents information on the nature of symptoms seen in MDD with co-occurring substance use disorder (SUD). Relative to those with only MDD, those with MDD

and SUD had an earlier age of onset of depression, greater depressive symptomatology, more frequent concurrent anxiety disorders and greater functional impairment. Comorbid patients were more likely to endorse compulsive obsessive disorder (OCD) symptoms, panic disorder, social phobia, and post-traumatic stress disorder (PTSD). Those with MDD and SUD had greater mood variation and negative self-outlook than those without SUD. Also the SUD group reported more hypersomnia, anxious mood, and suicidal ideation than the MDD alone group. Co-occurring mental illness and substance abuse may increase the risk for violence. Individuals with co-occurring MDD and SUD were at higher risk for suicide had less education, an earlier age of onset of MDD, greater length of illness, and more depressive episodes. Further, MDD and SUD are associated with increased risk of suicide and greater psychiatric comorbidity.

Major Depression Disorder (MDD) impacts the treatment of substance use disorders. For example, data on the impact of depression, as measured using the Beck Depression Inventory (BDI) on in treatment alcohol use from the active treatment phase of Project MATCH (the first three months) suggest that depression at treatment entry is associated with both drinks per drinking day (DDD), and percent days abstinent (PDA) during month 1 of treatment, but not during months 2 and 3; further, month 2 DDD and PDA were associated with BDI depression score at month 3 (Conner, Sorensen, & Leonard, 2005). In short, depression is associated with heavier drinking early in treatment while heavier drinking earlier in treatment is associated with later in treatment depression.

Compton, Cottler, & Jacobs et al. (2003), using a primarily cocaine dependent sample derived from the Substance Use and Risk of AIDS Study that targeted individuals entering drug treatment in St. Louis who were at high risk for HIV, examined the impact of lifetime MDD on drug treatment outcomes at 1 year follow-up among 425 individuals with dependence on at least one substance at intake. Outcomes assessed (derived using the National Institute of Mental Health Diagnostic Interview Schedule, version IIIR) included the number of illicit drugs used, the number of drug dependence criteria met, and the number of drug dependence diagnoses. Findings indicated significantly higher substance use

rates for individuals with MDD relative to individuals without MDD. Specifically, at 1year follow-up, the mean number of substances used was 2.0, the mean number of substances dependence criteria met for any substance was 4.2, and the mean number of substance dependence diagnoses was 0.9. This compares to respective rates of 1.4, 3.1, and 0.6 for individuals without a co-occurring diagnosis of MDD.

In multivariate analyses conducted separately for men and women that controlled for age and race, comorbid MDD was a significant predictor of number of illicit drugs used among men but not among women, was a significant predictor of the number of drug dependence diagnoses among men but not among women. Among treatment seeking individuals with a lifetime history of MDD, substance disorders may be more severe as characterized by higher incidence of poly-substance use, more dependence symptoms, and more poly-substance dependence relative to individuals entering drug treatment without a history of MDD (Castel, Rush, Urbanoski & Toneatto, 2006).

2.1.2 Alcohol Misuse and Depression

Alcohol misuse is a major public health concern because the condition is costly yet preventable. Alcohol misuse is heavy consumption of alcohol, drinking more than 5 drinks of alcohol per occasion (Cherpitel & Ye, 2008). Men misuse alcohol more than women. Only 4.6% of women have 12 or more days of heavy drinking (5 drinks per day), compared to 16.5% of men (National Institute of Alcohol Abuse and Alcoholism, 2009).

2.1.2.1 Alcohol Misuse and age

As males get older, the percentage engaging in heavy drinking for 12 or more days a year decreases from over 25% between ages 18 to 24 to 4.5% at age 65 and older (National Institute of Alcohol Abuse and Alcoholism, 2009). Differences in alcohol misuse among males exist within race, marital status, educational level, and income (National Institute of Alcohol Abuse and Alcoholism, 2009).

2.1.2.2 Alcohol Misuse and Health Issues

Misuse of alcohol is one of the leading causes of morbidity and mortality, resulting in over 107, 000 alcohol-related deaths every year (Fernandez, Hartman, & Olshaker, 2006). Additionally, excessive alcohol use can have far-reaching effects on physical and mental health. Alcohol misuse has been linked with liver disease, peripheral neuropathy, insomnia, seizures, poor nutrition, injuries, and hospitalization (St John, Montgomery, & Tyas, 2009). As a result of these implications, alcohol misuse is one of the costliest public health problems in the United States (Williams, et al., 2006).

Another health concern that is rising in prevalence and whose notoriety has increased as a global public health issue is depression (Watts, 2008). Major depression is estimated to affect 6.7% of Americans aged 18 and older (Chakraburtty, 2009). Similar to alcohol misuse, depression has been associated with numerous health issues. Some of these conditions are impairment, poor health, and mortality (Hasin, Goodwin, Stinson, & Grant, 2005).

The marked similarities between alcohol misuse and depression have made both disorders targets for research to find causal agents or risk factors for both. Substance use and depressive disorders frequently co-exist (Gratzer, et al., 2004). Due to their common co-occurrence, often one condition is recognized and the other condition is completely neglected. The National Comorbidity Study found that 48.5% of women and 24.3% of men with a lifetime alcohol-related problems also presented with major depression (Curran, Flynn, Kirchner, & Booth, 2000). It is reported that of individuals who suffer from depression, 25% acknowledge excessive alcohol consumption (Watts, 2008). Symptoms of depression can be caused by drinking or the subsequent withdrawal from drugs or alcohol (Curran, Booth, Kirchner, & Deneke, 2007). Alone, alcohol misuse and depression are devastating conditions, but together, they have much larger implications such as increased risk for suicide and deteriorating physical and mental health (Bazargan-Hejazi, Bazargan,Gaines, & Jemanez, 2008; Watts, 2008).

An affliction with one disorder increases the risk for developing the other disorder. Severe alcohol misuse can extend the length of time a person is depressed. Excessive drinking can make life more stressful and relationships more difficult, which in turn promotes depression (Conner, Pinquart, & Gamble, 2009). Alcohol misuse is also associated with a downed mood and all-consuming sadness (Watts, 2008). On the other hand, untreated depression increases the risk for relapse once alcohol use is abstained (Pettinati, 2004). An individual suffering from depression may turn to alcohol under the pretense that it will soothe their feelings (Watts, 2008). The cyclical nature of alcohol misuse and depression can make the conditions much more difficult to detect and treat (Watts, 2008).

Many studies have found an association between depression and level of alcohol consumption (Alati, et al., 2005; Dixit & Crum, 2000). But, in other studies, the relationship has been negative for some measures of alcohol consumption (Graham & Schmidt, 1999; Wang & Patten, 2001). Study findings may differ as a result of the ways depression and alcohol are measured (Graham, Massak, Demers, & Rehm, 2007). Graham et al. (2007) concluded that the magnitude of the relationship between depression and alcohol consumption is influenced by measurement of these variables. Depression is sensitive to measurement when determining gender differences between depression scores. The link between alcohol consumption and depression was consuming large amounts of alcohol per occasion, which was stronger for women than for men. Alcohol consumption's link to depression was showing to be even stronger for women than men. This finding also validated that drinking patterns play a more significant role in depression than overall volume of consumption (Rehm J., et al., 2004). Haynes and colleagues (2005) tested alcohol consumption as a risk factor for depression and anxiety. Men who binge drank on a monthly basis had a three-fold increased odds of anxiety and depression at follow-up. No such association was established among women (Haynes, et al., 2005). This finding supports the idea that drinking patterns may be more significant than volume of consumption.

Alcohol use is deeply embedded in many societies, and about 2000 million people drink alcohol in most parts of the world. Alcohol use is associated with risky sexual behaviors a major mode of HIV transmission (WHO, 2005). Rates of alcohol use disorders are high among HIV patients. The co-occurrence of alcohol use disorders and HIV may lead to medical and psychiatric complications. Depressive symptoms have been linked to HIV progression through a number of biobehavioral mechanisms including increased alcohol use. Although research supports an association between alcohol use and depressive symptoms among HIV patients, there have been few studies that have examined whether depressive symptoms predict subsequent drinking, especially among heavy drinking HIV-infected patients or vice versa (Palfai, 2013).

2.2 Factors Related to Depression

The etiology of depression can be multi-faceted. Genetic make-up of the brain may be involved. In addition, both internal and external forces may be related through internal thoughts and feelings or by environmental factors. Determining the origin of a client's depression through the professional use of appropriate severity measurement instruments leads to the development of more relevant treatment options. Major depression and addiction are mental health problems associated with stressful events in life, and are linked to high relapse and recurrence even after treatment. Some of the external factors that have been highly correlated to depression are general medical conditions, and substance abuse including alcohol, domestic, physical, and sexual abuse, grief, isolation, lack of a functional social system, relationship issues, oppression, and lack of basic resources.

2.2.1 Substance abuse

Substance abuse, including alcohol has been related to depression, and is also considered to be a possible cause of depression. Substance abuse disorder, including alcohol, was diagnosed

along with major depressive disorder in 25 percent of clients (Melartin, et al, 2002). The existence of rumination correlated to depression predicted increases in social problems related to substance use and predicted future increases in substance abuse symptoms (Nolen-Hoeksema, Stice, Wade, & Bohon, 2007).

2.2.2 General medical conditions

General medical conditions have been related to depression, and are also considered to be a possible cause of depression. Recent cognitive changes must be taken into consideration. Criterion A of Mood Disorder Due to a General Medical Condition states that a "mood disturbance may involve depressed mood … or elevated, expansive, or irritable mood (DSM, Appendix A, page 746). Medical problems, such as hyperthyroidism, multiple sclerosis, and brain tumors, may affect cognitive ability (Morrison, 2007). Morrison discusses that a physical examination can rule out for medical disorders, and if there is any suspicion of such a condition, the client should be referred to their primary care physician or the emergency room for medical assessment. Due to safety concerns, both substance abuse including alcohol, and general medical conditions must be ruled out early in the assessment process. Both disorders can be influenced by genetic predisposition and personal development within the family (Beck & Alford, 2006).

2.2.3 Grief

Although depression can be closely related to grief, intense depression beyond a two-month period must be considered separate from normal depression. As stated in the DSM, under the criteria for major depression, the symptoms of depression are not to be better accounted for by bereavement, i.e., after the loss of a loved one, if the symptoms persist for longer than two months or are characterized by marked functional impairment, morbid preoccupation with worthlessness, suicidal ideation, psychotic symptoms, or psychomotor retardation (DSM). Beyond this length of time, Prolonged Grief Disorder (PGD) must be considered. Symptoms

related to PGD go beyond the typical diagnosis of major depressive disorder (Prigerson, Vanderwerker, & Maciejewski, 2007). Research has shown that after the loss of a significant other, a large number of people develop debilitating symptoms of grief that are distinct from existing disorders in the DSM and predictive of enduring functional and health impairments with a persistently elevated set of specific symptoms of grief identified in those with problematic adjustment to a loss (Latham & Prigerson, 2004).

The Inventory of Complicated Grief: a Scale to Measure Maladaptive Symptoms of Loss helps to identify the symptoms associated with Prolonged Grief Disorder (PGD) (Shear, Frank, Houck, & Reynolds, 2005). Prolonged Grief Disorder is defined as present when, after loss, a person suffers from one of three symptoms of separation distress, which include: 1) unbidden memories or intrusive thoughts related to lost relationship; 2) intense spells or pangs of severe distress related to lost relationship; and 3) distressingly strong yearnings for that which was lost. Also present would be at least five of the following nine cognitive, emotional, and behavioral symptoms that have caused significant impairments in functioning for at least six months: 1) sense of self as confused or empty since the loss because a part of self died as a result of the loss; 2) trouble accepting the loss as real; 3) avoidance of reminders of the loss; 4) inability to trust others since the loss; 5) extreme bitterness or anger related to the loss; 6) extreme difficulty moving on with life (e.g., making new friends, pursuing interests); 7) pervasive numbness and absence of emotion since the loss; 8) feeling that life is unfulfilling, empty, and meaningless since the loss; 9) feeling stunned, dazed or shocked by the loss. Along with separation distress and cognitive emotional and behavioral symptoms, symptoms of depression and prolonged grief may include poor appetite, feeling blue, worrying too much about things, feeling no interest in things, and blaming oneself for things (Stroebe, Stroebe, & Abakoumkin, 2005). Studies have shown that PGD represents a unique

set of grief-related psychopathology that would be missed with an exclusive focus on depression or anxiety (Boelen, van den Bout, & de Keijser, 2003).

2.2.4 Abuse and violence

Domestic violence is one of the many risk factors for depression. It is often related to lower socio-economic conditions due to unemployment, which is typically higher in oppressed populations. In minority neighborhoods, domestic violence causes a rise in frequent residence moves, and multiple stressful life events. (Caetano & Cunradi, 2003). Perpetrators are known to use strategies that shift the focus and blame to their victims. Perpetrators work diligently to isolate victims from family and friends. When speaking with these individuals, perpetrators will often confide that they are having "trouble at home," warning that the victim may come to them with "some story," thus implying that the victim is lying, and may be mentally or emotionally unstable. The road to recovery from physical violence includes recovery from psychological fear, depression and anxiety, self-deprecation, discrimination, and economic roadblocks including a lack of resources. Clinicians must be aware that simple freedoms which are assumed to exist, for example, safety and freedom of choice (i.e., where to live, who to socialize with) are often unavailable to victims of domestic abuse (Wetendorf, 2007).

Sexual victimization has been linked to significant mental health consequences, with the most commonly diagnosed mental illness being major depressive disorder (Campbell, Jones, & Dienenmann, 2002). Individuals with a history of sexual abuse and major depressive disorder showed evidence of a higher rate of disability in areas of mental health, bodily pain, role and social functioning. Abuse and depression were shown to be overlapping. Subjects with major depressive disorder were twice as likely to report having been abused at some point in their lives, compared to those without a depressive disorder. Recent abuse was associated with increased hospital admissions during the prior year, and was unrelated to direct physical

effects of abuse (Pico-Alfonso, Garcia-Linares, Celda-Navarro, Blasco-Ros, Echeburúa, & Martinez, 2006).

Research findings also suggest that sexual and physical abuse have been linked with poor physical and mental health outcomes well into late life (Dube, Felitti, Dong, & 2003). Mental health consequences include depression, anxiety disorders, eating disorders, sexual disorders, suicidal behavior, and substance abuse (Springer, Sheridan, & Kuo, 2003). Both sexual and physical abuse have been significantly associated with low levels of social support, lower rates of marriage, and a higher occurrence of broken relationships, and have also been significantly associated with a greater likelihood of attaining education beyond high school (Draper, Pfaff, Pirkis, Snowdon, Lautenschlager, Wilson, & Almeida, 2008).

Many different pathways affect mood disorders. Biologically, the stress response is involved, and abnormalities in the hypothalamus, as well as the pituitary and adrenal glands are included. Autonomic responses have been documented in women who have suffered from abuse (Helm, Newport, & Helm, 2000). Increased activity in the biological pathways has been found to suppress immune functioning in women who have suffered from abuse (Altemus, Cloitre, & Dhabhar, 2003). Physiological symptoms are consistent in abuse survivors, and they affect both blood pressure and heart rate (Buckley & Kaloupek, 2001) linked to an increase in the risk of cardiovascular disease in middle-aged women (Batten, Aslan, & Maciejewski, 2004). A person's emotions relate to mental health outcomes such as depression, posttraumatic stress disorder (PTSD), and suicidal behavior.

Susceptibility to mood disorders is likely to increase the development of aggressive or impulsive personality traits, and impairment of an individual's sense of personal control. An individual's cognitive pathways include the beliefs and attitudes that shape daily life (Springer, et al., 2003). Cognitively, whether people consider themselves to be healthy or unhealthy seems to be of major importance (Kendall-Tackett, 2002). A person's social

pathways link abuse and health outcomes through difficulties in establishing intimate relationships, low self-esteem, and psychological distress (Springer, et al., 2003)

The effects of abuse appear to last a lifetime; however, maturity sometimes improves these effects in more resilient individuals who cope better under stress (Vaillant & Mukamal, 2001). Temperament and personality factors are also related to how well an individual deals with the effects of abuse (Weiss & Costa, 2005). Additionally, religious or spiritual coping has been shown to be a protective factor for suicidal behavior in depressed adult victims (Dervic, Grunebaum, & Burke, 2006). Evidence shows that cognitive behavioral therapy can relieve suffering in women with depression associated with abuse (Springer, et al., 2003), and community-based educational programs have been shown to improve a person's sense of mastery and to reduce loneliness, depression, and stress (Vaillant & Mukamal, 2001).

2.2.5 Isolation

Loneliness and social exclusion are major issues for those with mental illness. Isolation may precede problems which lead to depression, as commonly occurs in rural communities due to distance from services, lack of transportation and lack of social support (Cattan, White, Bond, & Learmouth, 2005). Many clients report that they experience loneliness often, if not all the time. The separation between clinical treatment services and psychosocial rehabilitation programs for people with mental illness creates a system that is fragmented. It makes it easy for consumers to fall through the cracks. For this reason, greater collaboration between psychosocial and clinical services is recommended with an emphasis on the encouragement of psychiatrists to refer people to local community programs (Elisha, Castle, & Hocking, 2006). Isolation also appears to exacerbate already existing depressive disorders. Isolation is correlated with the stigma suffered by those who have a mental diagnosis. Negative attitudes have caused lower rates of employment for the mentally ill, and often prevent people with a mental diagnosis from attaining successful integration or reintegration into their communities.

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Greater public acceptance must be encouraged so that people may more successfully reintegrate (Mayville & Penn, 1998). The preferred modes of intervention include the introduction of skills for those with mental illness, as well as strengthening the level of environmental supports (McReynolds & Garske, 2002).

2.2.6 Self-control

Psychologist Martin Seligman proposed that people are in control of reaching their ultimate happiness by pursuing personal pleasures through their activities and professions, by engaging in meaningful relationships, and by applying their knowledge and skills to serve others (Wallis, 2005). In support of the concept that depression is related to external factors, researcher David Lykken (2001) maintained that people are in control of their psychological states, reporting that they can change their happiness levels widely, both up or down. Although in Lykken's survey of 4000 subjects, the majority supported a genetic theory, eight percent reported that external factors, such as marriage, social status, and money, affected their happiness. The fact that people who suffer from depression identify external factors as causing their mood disorder, establishes a connection between depression and a response to outside factors (Easterbrook, 2005).

2.2.7 Co-occurring mental disorders

In the incidence of comorbidity in patients with personality disorder had a greater likelihood of more lifetime depressive episodes than any other co-occurring disorders. There was also a variance when it came to relationships and living arrangements. It was found that those with both major depressive disorder and a personality disorder were more likely to live alone. A cohort study of depression with co-occurring disorders was assessed in clinical interviews. The study concluded that 79 percent of patients with major depressive disorder suffered from one or more co-occurring mental conditions. Anxiety disorder was present in 57 percent of the people diagnosed, personality disorders were present as a co-occurring illness in

44 percent of subjects, and substance abuse disorder, including alcohol, was diagnosed along with major depressive disorder in 25 percent of clients (Melartin, et al, 2002). The co-occurrence of depression correlated with substance abuse, general medical conditions, personality disorders, and mental conditions such as posttraumatic stress disorder, creates the need for special consideration. Co-occurring disorders, such as medical conditions and/or substance abuse issues, have been highly correlated to multiple hospital admissions and increased risk of suicide (Gellar, Fisher, & McDermeit, 1995). Other neuropsychiatric complications of HIV include HIV encephalopathy, depression, mania, cognitive disorders, and Frank dementia, alone or in combination. Understanding the trends associated with co-occurring disorders can assist mental health professionals in the proper formulation of an effective treatment plan to help clients with issues related to dual diagnosis.

2.2.8 Gender, Depression and Alcoholism

An extensive literature has demonstrated linkages between substance use and mental health problems, gender and mental health problems, and gender and substance use. Adolescents as a subgroup of the population are well known to be at risk of substance use and are being recognized increasingly as being at risk of depression (Lewinsohn, Rohde & Seeley 1998). Furthermore, gender differences have been observed in the prevalence of both depression and substance use in the general adolescent population. What remains less well understood, however, is the role of gender in substance use as a predictor of depression in the general adolescent population.

Canadian studies of youth have revealed a life-time prevalence of depression of 21% in females and 11% in males 12–19 years of age (Galambos, Leadbeater & Barker 2004), and a 12-month prevalence of depression of 8% in females and 4% in males 15–24 years of age

(Statistics Canada 2002). In the United States and Europe, life-time prevalence estimates for Major Depressive Disorder (MDD) among adolescents have ranged from 13% to 22% by age 18 (Lewinsohn et al. 1993; Kessler & Walters 1998) and point prevalence estimates have ranged from 3% to 7% (Cooper & Goodyear 1993; Lewinsohn et al. 1993; Garrison *et al*. 1997; Oldehinkel, Wittchen & Schuster 1999).

The prevalence of depressed mood is higher than that of depressive disorder. When adolescent-specific cut-points are used, the prevalence of depressed mood based on depressive symptom scales such as the CES-D (Centre for Epidemiological Studies—depression scale; Radloff, 1977) has been estimated from 9% to 31% (Rushton, Forcier & Schectman, 2002). Although such scales are not designed to diagnose clinical depression, they provide important insights into the construct of depression in adolescents. In particular, an elevated but subthreshold score is thought to indicate a real level of suffering (Gotlib, Lewinsohn & Seeley 1995). Elevated depressive symptoms in adolescence are also a risk factor for the development of adult depressed mood and adult depressive disorder (AaltoSetala et al., 2002).

Regarding gender, numerous studies have shown female adolescents to be at greater risk of elevated depressive symptoms and unipolar depressive disorder than are male adolescents (Lewinsohn et al., 1998; Rushton et al. 2002; Wade et al. 2002; Kuehner 2003; Sund, Larsson & Wichström 2003). Females have a twofold greater risk of depression than do males (Angst et al. 2002; Wade et al. 2002; Kuehner 2003). The vulnerability to depression among females begins in early adolescence and is maintained throughout life (Hankin et al. 1998; Wade et al. 2002; Kuehner 2003). Various explanations have been proposed to explain this gender difference including a complex interaction of hormonal factors, social factors and pre-existing vulnerabilities (O'Keane 2000; Piccinelli & Wilkinson 2000; Kuehner 2003).

Depression and alcohol use have been found to exist concurrently in adolescents. Torikka et al. (2001) found that 23.6% of depressed females consumed alcohol once a week or more compared to 7.1% of females who were not depressed. Increasing levels of problematic alcohol use are associated with an increasing probability of depressive disorder in a dose–response pattern (Rohde, Lewinsohn & Seeley 1996). Early symptoms of depression are linked to later problem drinking even when accounting for demographic factors (Aalto-Setala et al. 2002).

2.3 Impact of Alcohol on HIV Disease Progression

In addition to the association of alcohol with the behavioral variables of unprotected sexual intercourse and poor adherence to HIV medication, there are other more distinctly biological factors relating to alcohol consumption and ART. These biological interactions provide an evidence-base for advice and other interventions to alter alcohol consumption for patients receiving ART. Diaz et al. (2002) demonstrated that moderate consumption of alcohol, particularly of alcoholic beverages containing antioxidants may protect immune cells from damage. Hence, the health impact of certain types and patterns of alcohol consumption generally and more specifically for HIV positive individuals may be beneficial. However, the effect of alcohol on human health and welfare is overwhelmingly negative, certainly at a population level, and similarly, the impact of alcohol on the acquisition, transmission and natural course of HIV is considered to be detrimental. The negative effect of alcohol consumption on HIV prognosis may be a more general one; not targeting specific systems in the body. According to Watzl et al. (1992) alcohol is toxic for the host defense system.

In addition, excessive consumption can induce malnutrition which impacts negatively on immune-competence. Alcohol consumption has a detrimental effect on many organs and tissues in the human body, which impacts on HIV pathogenesis. In particular, infection with HIV results in the depletion of mucosal CD4+ lymphocytes. Balagopal et al. (2008) hypothesized that both alcohol and HIV may accelerate liver disease through microbial translocation (disruption of gut epithelial integrity and increased mucosal translocation of bacteria and bacterial products). However, the authors point to a more plausible explanation, namely, that microbial translocation is both a cause and an effect of liver disease progression and systemic immune activation.

In addition, animal and human studies demonstrate that alcohol consumption has detrimental effects on both the innate and the acquired immune systems (Molina et al., 2002). The CD4 cell count indicates the strength of an individual's immune system. The viral load is a measure of the level of the HIV virus in the patient's blood and is used to monitor the effectiveness of ART. The CD4 count and the viral load together predict HIV progression; they co-vary inversely. The higher the viral load and the lower the CD4 cell count, the faster the HIV patient contracts infections and opportunistic diseases and reaches the final stages of AIDS and ultimately death. A study by Samet et al. (2003), concluded that alcohol consumption was associated with lower CD4 counts and higher RNA (ribonucleic acid) counts; compliance was a control variable for those on ART with a history of alcohol problems.

In a later study by Samet et al. (2007) heavy alcohol consumption, compared with abstinence, was associated with lower CD4 cell but not with higher viral load, for patients not receiving ART. Heavy alcohol consumption accelerates HIV disease progression for those not yet on

ART. The effect of alcohol on CD4 cell count seems to be independent of ART (Fabris et al., 2000) and alcohol intake does not appear to directly impact on HIV viral load. The effect of alcohol on viral load instead seems to be via reduced ART adherence (Baum et al., 2010).

Many of the effects of alcohol consumption on innate (nonspecific) immune response are dose dependent, with acute or moderate use associated with attenuated inflammatory responses, and heavy ethanol consumption linked with the augmentation of inflammation (Goral et al., 2008). Acute alcohol exposure suppresses the production of pro-inflammatory response, including tumor necrosis factor (TNF)-α and IL-1β in macrophages in the lungs and in the white blood cells, important in immunity (Goral et al., 2008). Chronic alcohol consumption, in contrast leads to increased levels of pro-inflammatory response; the implication of this is that there are more cells for the HIV to attack throughout the body and at key transmission sites.

The in vitro, specific immuno-modulatory effects of ethanol (alcohol) have been documented: Alcohol consumption attenuates adaptive immune response reducing the number of CD4+ and CD8+ T-cells as well as reducing innate immunity natural killer (NK) cells and cytokine production related to adaptive immunity (Meadows et al., 1992). Impaired host defense after alcohol ingestion is linked to a combination of decreased inflammatory response, altered cytokine production and abnormal reactive oxygen intermediate generation (Szabo, 1999). Szasbo (1999) states that a key element in the alcohol-induced decrease in cell-mediated immunity is decreased antigen presenting cell function. Alcohol inhibits antigen presentation required to regulate the activity of T-and B-cells, a key step in the initiation of the adaptive immune response.

Both alcohol and HIV modulate innate and adaptive immunity by disrupting cytokine and chemokine signaling, depleting crucial immune cell populations, inhibiting maturation of key

immune effectors such as dendritic cells, and impairing CD4+ T helper function, and antiviral cytotoxic T cell activity (National Institute on Alcohol Abuse and Alcoholism, 2006). From these examples it can be inferred that alcohol consumption, via its impact on the immune system, alters the pathogenesis of HIV.

CHAPTER 3: RESEARCH METHOD

This chapter describes the study site, population of interest and discusses the research design, sampling design, data collection methods and data analysis techniques which was employed.

3.1 Study Design

This study was a descriptive cross-sectional study.

3.2 Study Area Description

The study was conducted at the CCC, Kenyatta National Hospital, which is managed under the department of Respiratory and Infectious Diseases Unit, Medical Services. Kenyatta National Hospital is a teaching and referral hospital that receives patients from all over eastern and central Africa. Hence, there is need to ensure optimum service provision and best outcomes in interventions administered to patients presenting to it.

Kenyatta National Hospital Comprehensive Care Centre was established in December 2002 to offer holistic care and support to patients infected and affected by HIV/AIDS. The Centre currently has a population of over 8,000 patients benefiting from Anti-Retroviral drugs (ARVs). The Centre attends to more than 150 patients per day. Out of the 150 patients seen per day, 25 were children below 10 years, 13 adolescents, 10 were new patients over 18years and 102 were on-going old patients who were over 18 years old. My target population included the 10 new patients and the 102 old patients.

The Centre acts as the referral Centre for those patients who have developed complications from antiretroviral treatment from the whole country or those patients who have failed on first line of treatment and require to be started on second line therapy. Activities of the CCC include:

a. Clinical care – Antiretroviral drug initiation, treatment of opportunistic infections and monitoring of patient;

b. Training and facilitation of operational and clinical research in the field of HIV/ADS management;

c. Laboratory services – this includes both baseline and monitoring tests for example CD4/CD8, complete blood count, liver function tests and Renal function tests;

d. Pharmacy services – free ARV's and medicines for opportunistic infections;

e. Rehabilitation for those infected with HIV/AIDS virus through physiotherapy and occupational therapy;

f. Nutritional counseling and supplements;

g. Post exposure prophylaxis to rape survivors, occupational needle pricks and exposure to contaminated blood and body fluids;

h. Training in Comprehensive HIV/AIDS management and care to Health care providers;

i. Advocating for care and support for HIV/AIDS patients through Post Test Clubs and recruitment by expert patients;

j. Social work services – which includes coordination networking between comprehensive care Centre and other HIV/AIDS service providers;

k. Adherence and supportive Counseling to patients;

l. Follow-up and linkages and mentorship.

The CCC offers a multi-dimensional and multifaceted approach in the management of HIV/AIDS. To achieve this goal, a multi-disciplinary team with different specializations in HIV/AIDS management mans the Centre. The staff establishment comprises of: Medical specialists; medical officers; clinical officers; pharmacists; peer educators; medical records; psychologists; counselors, physio-therapist; social work; laboratory staff; nursing staff; nutritionists; security personnel; Administration, clerical and support staff; respiratory and infectious diseases department. Services are offered between 08:00am – 05:00pm including the lunch hour break.

3.3 Study Population

The study population consisted of PLWHA attending the CCC in KNH. The study population included all PLWHA aged 18 years and above. The study included both male and female patients attending the CCC.

3.3.1 Inclusion Criteria

Eligible participates in the study, included patients who were 18 years and above and who were able to speak and understand English or Kiswahili, the 2 most common languages spoken in Kenya. Other patient characteristics that determined participation included; willingness to participate in the study of those over 18 years; disabled (physically challenged) living with HIV/AIDS.; and patients that who consented and with an understanding of English or Kiswahili but had difficulties in reading and writing. Both female and male were included in the study. Only patients who gave written consent were eligible to participate in the study.

3.3.2 Exclusion Criteria

The study excluded patients attending the CCC who were below 18 years; those that were physically too ill to participate in the study, and patients who did not give consent to participate.

3.3.3 Sample size determination

The sample size determination was calculated using Cochran's formula (Czaja & Blair, 2005) for sample surveys as follows:

$$n = \frac{Z^2 \, p \, (1-p)}{d^2}$$

n= the sample size

Z = the standard value of the standard deviation score that refered to the area under a normal distribution of values (in the study confidence level was set at 95% whose critical value t corresponded to 1.96 from the table of standard normal distribution).

P= the percentage category for which we computed the sample size (p for this study was set at 18%). P for this study was obtained based on a study undertaken to examine the Screening for Hazardous Alcohol Use and Depressive Symptomatology Among HIV-Infected patients in Nigeria whose AUDIT score was reported at 12% (Farley et al., 2010) and another study in South Africa undertaken to examine HIV risk behavior among public primary healthcare patients with tuberculosis in South Africa whose AUDIT score was reported at 23% (Peltzer et al., 2013). P was the estimated proportion of adult patients who had an AUDIT score of 8 and above (a hazardous drinker) which was 18% based on an average from the two studies mentioned, that is $(12\% + 23\% / 2 = 18\%)$

d^2 = the squared value of one-half the precision interval around the sample estimate (in this study d is set at $\pm 5\%$)

Substituting:

$$n \quad = \quad \frac{1.96^2 \text{ X } (0.18 \text{ X } 0.82)}{0.0025} = 227 \text{ participants}$$

For this study, 273 participants were selected, 20% higher due to attrition factors.

3.3.4 Sampling Method

The study used systematic random sampling. In this sampling method, every K^{th} patient in the population frame was selected for inclusion in the sample. Out of the 122 (the N) adults over 18 years seen every day, the researcher used systematic sampling to obtain a sample of size 10 as follows:

$$K = \quad \frac{122}{10} \text{ (N)} \quad = 12.2 \approx 12K$$

The sampling interval was 12. The first patient was selected between 1 and 12(K) at random. Suppose the selected patient number was the 8th one. The first patient was number 8, the 2nd was 8+K that is 8+12=20; the 3rd was 8+2K that is 8+ 24=32 and so on. Every 12th patient was selected until the required sample size was achieved. The patients were interviewed and

informed about the study. If he or she agreed to participate, a consent explanation was given; if still interested in participating, a written consent form was provided for his or her signature. All patients who met the inclusion criteria were interviewed during the stipulated period of the study until the sample size was achieved.

3.3.5 Pilot Study

The pilot survey was conducted at Mathari Hospital, Comprehensive Care Centre which has registered patients living with HIV/AIDS and who attend the clinic. This study had a population of 273; we calculated ten percent (10%) of our population which gave us a total of 27 participants a figure that the researcher rounded to 30 participants. A pre-test of the questionnaires was carried out with 30 patients who did not participate in the actual study.

3.4 Data Collection Instruments

Socio-demographic questionnaire

This was the researcher's designed approach questionnaire to psychological assessment towards the CCC respondents. The socio-demographic questionnaire was to capture the age, sex, occupation, type of housing, type of treatment, how the patient learned about the disease, and how the news were broken to the patient.

The AUDIT

The Alcohol use Disorder Identification Test (AUDIT) was developed by the World Health Organization (WHO) in 1982 as a simple way to screen and identify people who were at risk of developing alcohol problems. Since 1989, the AUDIT has been used as a quick screening tool which is utilized in various parts of the world (Babor at al., 2002). Since then, the assessment and manual has been updated twice (1992 & 2002) to not only continue to identify the risky alcohol behaviors but also serve as an international assessment tool to help identify

alcohol dependence and abuse in both developing and developed countries (Babor et al., 2002; Meneses-Gaya, 2009). The AUDIT test focuses on identifying the preliminary signs of hazardous drinking and mind dependence. It is used to detect alcohol problems experienced within the last year. It is one of the most accurate alcohol screening tests available rated 92% effective in detecting hazardous or harmful drinking. Unlike some alcohol screening tests, the AUDIT has proven to be accurate across all ethnic and gender groups. It was designed to be used internationally and was validated in a study using patients from six countries. The test contains 10 multiple choice questions on quantity and frequency of alcohol consumption, drinking behavior and alcohol-related problems or reactions. The answers are scored on a point system; a score of more than eight indicates an alcohol problem. Total AUDIT scores range from 0 to 40. Based on the total score, participants will be categorized into the standard AUDIT categories: non-drinker (0), non-problem drinker (less than 8), harmful drinker (8 or more), or likely dependent on alcohol (13 or more for women, 15 or more for men; (Johnson et al. 2013). AUDIT was administered to 1888 persons, across 6 countries (Norway, Austria, Kenya, Bulgaria, Mexico, and U.S), in order to identify the questions that most accurately distinguished low- versus high-risk drinkers as well as alcohol dependence (Babor et al., 2002). Reliability – The most recent AUDIT manual summarize to say that it has performed equally well or at higher degree of accuracy (Babor et al., 2002, p. 13). It is reported that, "the results (of external research) indicate high internal consistency, suggesting that the AUDIT is measuring a single construct in a reliable fashion" (Babor et al., 2002, p. 13). Shields and Caruso (2003), report that the AUDIT maintains reliabilities between 0.79 and 0.81. The values indicate adequate proportions of true score variance for most purposes (Shields & Caruso, 2003, p. 408).

Validity - the AUDIT manual reports that when an 8 point cut off is utilized, it yields sensitivities for various indices of problematic drinking in the mid 0.90′s and is able to

correctly identify cases that do not qualify for problematic drinking 80% of the time (Babor et al., 2002).

Beck Depression Inventory (BDI-II) (Beck et al. 1996). The BDI was developed to measure the intensity, severity and depth of depression in respondents with psychiatric diagnosis. Its long form is composed of 21 questions each designed to assess a specific symptoms common among people with depression. The 21-question is a multiple choice with four responses and each response is assigned a score ranging **0-3** indicating the severity of the symptom. Individual questions of the BDI assess mood, pessimism, and sense of failure, self-dissatisfaction, guilt, punishment, self-dislike, self-accusation, suicidal ideas, crying, irritability, social withdrawal, body image, work difficulties, insomnia, fatigue, appetite, weight loss, and bodily preoccupation. The highest possible total for the whole test was 63 (sixty-three) and the lowest possible score for the test was 0 (zero). A positive depression screen was defined as BDI score greater than 10; scores 0-9 were defined as normal; 10-16 indicated a Mild mood disturbance; 17-20 indicated Borderline clinical depression; 21-30 defined Moderate depression; 31-40; defined Severe depression; and over 40 or higher - Extreme depression. A persistent score of 17 or above indicated need for immediate treatment. This test has been used for 35 years to identify and assess depressive symptoms and has been reported to be highly reliable regardless of the population. The BDI test is widely known and has been tested for content, concurrent, and construct validity. It has a high coefficient alpha, (0.80). Its construct validity has been established and it is able to differentiate depressed from non-depressed respondents. High concurrent validity ratings are given between the BDI and other depression instruments as the Minnesota Multiphasic Personality Inventory and the Hamilton Depression Scale; 0.77 correlation rating was calculated when compared with inventory and psychiatric ratings (Beck et al. 1996). BDI showed high construct validity with the medical symptoms it measures. Beck's study reported a coefficient alpha rating of .92 for

outpatients and .93 for college student samples. The BDI-II positively correlated with the Hamilton Depression Rating Scale, $r = 0.71$, had a one-week test–retest reliability of $r = 0.93$ and an internal consistency $\alpha = .91$.

3.5 Data Collection Procedure

At the CCC, participants who met the criteria of the study were briefed on the nature of the study. Those who participated gave a signed consent. The researcher administered the questionnaires to the participants starting with the Socio demographic, then AUDIT followed by the BDI questionnaires. Questionnaires were self-administered. Filling in of the questionnaires took approximately 30 minutes.

The researcher read out the questions exactly the way they appeared on the questionnaires to those individuals with reading and writing challenges and to those who were not able to fill out the questionnaires on their own. Their responses were recorded as answered. Any queries by the respondents' were responded to appropriately.

Each questionnaire had a clinic code number of the participant. The purpose of having the code was to enable the researcher provide necessary intervention e.g. referral to the counselors for those that needed psychological support or further treatment for those diagnosed with depression or alcohol use disorder. Another purpose of having the code was to enable the researcher ensure confidentiality. After data entry, those patients identified with depressive symptoms were referred for further interventions within the CCC facility. After completing the filing-in of the questionnaires, the subjects were thanked for their participation in the study and escorted outside the room.

3.6 Ethical considerations

The study was guided by following the ethical obligations pertaining to human research, hence, there was need for approval from the Research and Ethics Committee. (Ellsberg & Heise, 2005).

The research process began by obtaining approval from the Department of Psychiatry, University of Nairobi; Ethical approval was obtained from the Kenyatta National Hospital and University of Nairobi Research and Ethical Review Board who went through my proposal and gave the approval of the study. Permission was obtained from the KNH-CCC Manager to conduct the study in the facility. With the permission of the CCC Manager, the researcher set-up a desk at the main receiving reception where all patients report. The reason for choosing this area was because, patients were served according to the time they reported at the clinic reception desk. Files were removed for each patient before proceeding to his/her specific clinic for the day which served as an advantage area to sit for my study.

The objectives and procedures of data collection were explained to the patients who met the inclusion criteria at the CCC. The details of the ethical considerations were laid down in the letter of consent namely: consent explanation, confidentiality, personal and general benefits, risk and right not to participate and right to withdraw anytime were explained to the respondents.

Informed consent was obtained from the participants before administration of the socio-demographic questionnaires and research instruments. This was on the basis of appropriate information given in the informed consent form and adequate time was to consider the information and ask questions. The consent was written in a form bearing details on - ethical considerations procedure of the study, confidentiality, benefits, personal risks and the right not to participate or withdraw at any time.

Confidentiality was observed by ensuring that all information obtained was stored in a locker only accessible to the researcher. All information given to the study by subjects was treated in

strict confidence and no identity was revealed. Only the researcher had access to this information. Data collection tools were coded and no subjects' real names were used in the study. Filled data collections tools were kept under lock and key for three months after the study to facilitate confirmations and or referring to the data in case need arises to clarify any information. Filled data collection tools are to be destroyed after research findings are disseminated.

Benefits - there were no monetary benefits for the subjects. However, the information obtained from the study gave an understanding of the prevalence of alcohol use disorder and depression in patients attending CCC. The subjects were informed that the findings were to facilitate putting in place the best approaches possible in managing patients with the above conditions and to improve their quality of life. This benefit is not immediate for those that participated in the study but will be beneficial in the future, to them and others.

Risks – There was no anticipated physical harm to the participants. However, subjects were informed that they might experience psychological distress due to some questions concerning their living conditions; their mental health over the past years; and events that had taken place in their lives. They were further cautioned that the questions were uncomfortable and would remind them of painful experiences.

The participation was purely voluntary. Subjects were asked to volunteer information and no coercion or force was used.

Subjects diagnosed with BDI scores higher than 17 were referred to the CCC Psychologists for psychological support and further treatment. All treatment given conformed to the laid down policies of the CCC guidelines and no alternatives were offered. A subject was free to withdraw his or her participation at any time during the study without victimization. The subjects were also free to contact the Researcher in case of any issues they wished to discuss or clarify.

3.7 Data Management and Analysis

Data was collected using structured questionnaires and entered into a password protected Microsoft Access Database. The hard copy data forms were stored in a lockable cabinet in the Principal Investigator's office during collection and after analysis. These were moved to a lockable cabinet in the statistician's office during data entry and analysis. Upon completion of Data entry, hard copy forms were compared with the entered data to identify errors and corrections were made appropriately.

Descriptive statistics was carried out where discrete variables were summarized with frequencies and percentages while continuous variables were summarized using measures of central tendency and dispersion such as mean, median, mode, standard deviation and inter-quartile ranges.

The screening for alcohol use disorder was done using Alcohol Use Disorders Identification Test (AUDIT) scores. Total AUDIT scores range from 0 to 40. Based on the total score, participants were categorized into the standard AUDIT categories: non-drinker (0), non-problem drinker (less than 8), harmful drinker (8 or more), or likely dependent on alcohol (13 or more for women, 15 or more for men; Presence and severity of depression was estimated using a summary of Beck's Depression Inventory (BDI-II). Each individual patient was categorized as follows; positive depression screen was defined as BDI score greater than 10; scores 0-9 were defined as normal; 10-16 indicated a Mild mood disturbance; 17-20 indicated Borderline clinical depression; 21-30 defined Moderate depression; 31-40; defined Severe depression; and over 40 or higher - Extreme depression. A persistent score of 17 or above indicated need for immediate treatment.

As the main variables of interest, factors associated with alcohol use and depression were identified using Chi-squared tests and Fisher's exact tests for nominal variables and t-tests for continuous variables. Some of these factors included age, marital status, education level,

occupation, religion, income, STI/HIV counseling and testing history. We determined the relationship between alcohol use and depression in the same manner.

During multivariate analysis, we adjusted for confounders and effect modifiers in the model to determine independence in the relationship between alcohol use and depression. This was achieved using binary stepwise backward multinomial logistic regression.

3.8 Flow chart

```
┌─────────────────────────────────┐
│ Set-up desk at the main reception│──────────┐
│            Area                  │          ▼
│ Assess for eligibility using     │   ┌──────────────────────────┐
│ inclusion and exclusion          │   │ Did not meet inclusion    │
│ Gave study explanation           │   │ criteria                  │
└─────────────────────────────────┘   └──────────────────────────┘
              │                                   │
              ▼                                   ▼
   ┌──────────────────────┐          ┌──────────────────────────┐
   │ Met inclusion criteria│          │ Thanked & eliminated      │
   └──────────────────────┘          │ from the study            │
              │                       └──────────────────────────┘
              ▼
   ┌──────────────────────┐
   │ Gave Explanation of   │
   │ informed consent form │
   └──────────────────────┘
              │
   ┌──────────────────────┐
   │ Declined to sign      │
   │ informed consent      │
   └──────────────────────┘
              │
              ▼
   ┌──────────────────────┐
   │ Thanked and           │
   │ eliminated from       │
   │ study                 │
   └──────────────────────┘
```

Set-up desk at the main reception Area
Assess for eligibility using inclusion and exclusion
Gave study explanation

Did not meet inclusion criteria

Met inclusion criteria

Thanked & eliminated from the study

Gave Explanation of informed consent form

Declined to sign informed consent

Thanked and eliminated from study

Signing of informed consent form and administering of questionnaires
- Socio-demographic
- AUDIT and
- BDI

Patients who did not experience psychological distress or
- Diagnosed with depression or
- Diagnosed with AUD

Thanked them and wished them well.

Patients who experienced
- psychological distress
- Diagnosed with depression
- Diagnosed with AUD

Data Analysis

Thanked them and Referred to the CCC psychologist for support and treatment

Report Writing and dissemination

3.8.1 Flow Chart explanation

At the CCC, the researcher set up a desk at the main reception area where all patients report before proceeding to their specific clinic for the day. The patients were screened for eligibility using the inclusion and exclusion criteria. The study explanation was given at this point. Patients who did not meet the inclusion criteria were thanked and eliminated from the study. In the room, those who met the inclusion criteria were shown to a room that was set up for data collection. It is here that the subjects were given an explanation of informed consent form. If they agreed to participate in the study, they were asked to sign the written consent form. For subjects who declined to sign the consent form, they will be thanked and eliminated from the study. After signing the informed consent form, the researcher administered the questionnaires starting with the socio demographic questionnaire, then the BDI and then the AUDIT. Data was analyzed and those found to experience psychological distress or diagnosed with depression or AUD, were referred to the CCC psychologists for support and further treatment. After completing the filing-in of the questionnaires, the subjects were thanked for their participation in the study and escorted outside the room.

CHAPTER FOUR

4.1 RESULTS

4.1.1 Introduction

Two hundred and seventy three participants were recruited for the study. One participant failed to complete the questionnaire fully and was not included in the final analysis; giving a 99.6% (272) response rate.

4.2.1 Social Demographic Characteristics of the Study Participants

The study sought to identify distribution of the participants as summarized in Table 1 below. Distribution of participants according to gender, slightly more than half, 51.1% (139) were male and 48.9% (133) of participants were female. Distribution of participants according to age groups, the results showed that more than half of the participants were in the age category of 33 years and above 55.9% (152), 30-33 years were 16.5% (45), 25-29 years were 11% (30), 22-25 years were 8.8% (24) and 18-21 years were 7.7% (21). The minimum age was 18 and the maximum age was above 33 years. On marital status, the study sought to establish the distribution of participants as at the time of participating in the study, 45.66% (124) were married, 36.8% (100) were single, 8.1% (22) were separated and 6.2% (17) were cohabiting, the rest were either divorced or widowed. Distribution of participants according to the level of education that each participant had attained at the time of participation in the study indicated that; only a few, 1.8% (5) had no education, 13.6% (37) had primary education. Over two thirds of the study respondents had at least secondary education where 37.5% (102), 33.5% (91) had college education and 37 (13.6%), had university education.

Distribution of participants according to their livelihoods indicated that; most of the respondents had a source of income where 47.1% (128) were self-employed and 42.6% (116) were employed. The rest were retired, never employed or laid off. The study established the monthly income in Kenya Shillings of the participants as follows: over half of the study participants were earning a salary below Kenya Shillings 20,000 with 39.4% (104) earning 1,000-10,000, and 28.4% (75) earning between11, 000-20,000 shillings. 12.9% (34) were earning between 20,000-30,000 shillings a month. While 7.6% (20) were earning 30,000-40,000, and 4.5% (12) were earning 40,000-50,000. Only 7.2% (19) were earning 50,000 and above. Distribution of participant's religion indicated that most of the participants, 84.5% (230) were Christians of which 38.2% (104) were Catholics and 46.3% (126) were Protestants. Muslims were 4.4% (12), while other religions (Traditional, Earthiest, Pagan and

Hinduism,) accounted for 11% (30). Distribution of participant's housing showed that less than a fifth, 18.1% (49) lived in their own houses, while 64.2% (174) were living in rented houses, 10.3% (28) living with parents, 4.8% (13) lived with friends and 2.6% (7) lived with other people or facilities.

Table 1: Socio-demographic characteristics

Characteristic	Category	n (%)
Gender	Male	139 (51.1%)
	Female	133 (48.9%)
Age category	18-21 years	21 (7.7%)
	22-25 years	24 (8.8%)
	25-29 years	30 (11%)
	30-33 years	45 (16.5%)
	>33 years	152 (55.9%)
Marital status	Married	124 (45.6%)
	Cohabiting	17 (6.2%)
	Single	100 (36.8%)
	Divorced	5 (1.8%)
	Separated	22 (8.1%)
	Widowed	4 (1.5%)
Level of education	None	5 (1.8%)
	Primary	37 (13.6%)
	Secondary	102 (37.5%)
	College	91 (33.5%)
	University	37 (13.6%)
Employment	Employed	116 (42.6%)
	Self-employed	128 (47.1%)
	Retired	7 (2.6%)
	Never employed	17 (6.2%)
	Laid off work	4 (1.5%)
Income bracket in Kenya Shillings per month	1k-10 KShs	104 (39.4%)
	10k-20 KShs	75 (28.4%)
	20k-30 KShs	34 (12.9%)
	30k-40 KShs	20 (7.6%)
	40k-50 KShs	12 (4.5%)
	>50 KShs	19 (7.2%)
Religion	Catholic	104 (38.2%)
	Protestant	126 (46.3%)
	Muslim	12 (4.4%)
	Other	30 (11%)
Housing	Own	49 (18.1%)
	Rented	174 (64.2%)
	Friends	13 (4.8%)
	Parents	28 (10.3%)
	Other	7 (2.6%)

4.2.2 HIVCounseling, Testing and Treatment

Table 2a below provides a summary of HIV counseling and testing information. Slightly below half of the respondents had been tested in a VCT site 45.8% (124) with 25.1% (68) being tested in a health facility and the rest tested in other places. 29.2% (79). Reasons for testing included self-referral 55.1% (150), referral by medical personnel 32.7% (89), and other reasons 7.7% (21)

Test results in majority of the participants 93% (19) were communicated by VCT service providers: VCT counselor 46.9% (127), medical personnel after counseling 32.5% (88), Nurse after counseling 10.3% (28), Medical personnel without counseling 3.3% (9), nurse without counseling 2.6% (7), and other persons 4.4% (12).

Table 2a: HIV Counseling and Testing

Variable	Category	n (%)
Do you have an STI/ HIV counseling and testing history? If so, where was it done?	VCT Site	124 (45.8%)
	Health center/Maternity clinic/Hospital	68 (25.1%)
	Other	79 (29.2%)
How did you learn about the diagnosis	Self-referral to VCT	150 (55.1%)
	Referred by medical workers due health problems	89 (32.7%)
	Referred by family member	12 (4.4%)
	Other	21 (7.7%)
How was the news broken to you?	By the VCT counselor	127 (46.9%)
	By medical worker after counseling	88 (32.5%)
	no counseling was given by medical worker	9 (3.3%)
	By the nurse after counseling	28 (10.3%)
	no counseling was given by nurse	7 (2.6%)
	Other	12 (4.4%)

4.2.3 Treatment

As tabulated in Table 2b below, most of those tested participants 82% (224) were given treatment: 47.6% (130) were referred to VCT while 34.4% (94) were given ARV treatment. The rest were treated and discharged.

Table 2b: Treatment

What Treatment was Provided	n (%)
Counseling only	28 (10.3%)
Out-patient treatment	19 (7%)
In-patient treatment	6 (2.2%)
ARV's treatment	94 (34.4%)
Referred to CCC	130 (47.6%)
Other	6 (2.2%)

4.3 PREVALENCE OF ALCOHOL USE DISORDER

AUDIT tool was used to assess Alcohol Use Disorder (AUD), Majority of the participants; 86% (233) were not at risk: 73.3% (200) did not take alcohol, 12.7% (33) were social drinkers (AUDIT score 1–7), and prevalence of alcohol use disorder (defined as an AUDIT score ≥8) was 14% (38) broken as follows; 5.5% (15) had hazardous/harmful drinking behavior with a cut off score of ≥8 or more. Those dependent on alcohol were 8.5% (23), with AUDIT score cut off point of ≥13 or more for women, ≥15 or more for men. A summary of the results are indicated in Table 3 below.

Table 3: Alcohol Use Disorder

Alcohol disorder risk	N	%
Never used alcohol	200	73.3%
Not at risk	33	12.7%
Harmful/Hazardous drinking	15	5.5%
Alcohol dependence	23	8.5%

4.4 PREVALENCE OF DEPRESSION

To assess the presence of depressive symptoms, we used Beck Depression Inventory and found that 76.2% (205) had no features to meet DSM-IV criteria for depressive, 9.7% (26) had mild depression, 10.4% (28) had moderate depression and 3.7% (10) had severe depression. The results are shown in the Table 4 below.

Table 4: Becks Depression Inventory

Categorized BECKS Score	N	%
No depression	205	76.2%
Mild depression	26	9.7%
Moderate depression	28	10.4%
Severe depression	10	3.7%

4.5 BIVARIATE COMPARISONS FOR AUDIT AND SOCIO-DEMOGRAPHIC CHARACTERISTIC OF PARTICIPANTS

On bivariate analysis age, marital status, education, housing, HIV testing site, test results disclosure method and post-test care did not have statistically significant associations with alcohol abuse. However, gender, employment status and income level had statistically significant associations with alcohol abuse. Those that were more likely to report alcohol abuse problems were male respondents ($p<0.0001$), retired and laid off respondents ($p=0.05$) and those with monthly income higher than Kenya shillings 50,000. The results are summarized on Table 5 below.

Table 5: Bivariate comparison for AUDIT and Socio-demographic characteristics of participants

		AUDIT Risk						Chi square	P value
		Not at risk		Harmful/Hazardous drinking		Alcohol dependence			
		n	%	n	%	n	%		
What is your gender?	Male	106	76.3%	12	8.6%	21	15.1%	22.6	<0.0001
	Female	126	96.2%	3	2.3%	2	1.5%		
Employment	Employed	91	79.1%	11	9.6%	13	11.3%	15.2	0.055
	Self-employed	117	91.4%	3	2.3%	8	6.2%		
	Retired	5	71.4%	1	14.3%	1	14.3%		
	Never employed	17	100.0%	0	0.0%	0	0.0%		
	Laid off work	2	66.7%	0	0.0%	1	33.3%		
Income bracket in Kenya Shillings per month	1k-10k	91	88.3%	3	2.9%	9	8.7%	35.8	<0.0001
	10k-20k	69	92.0%	3	4.0%	3	4.0%		
	20k-30k	27	79.4%	4	11.8%	3	8.8%		
	30k-40k	16	84.2%	0	0.0%	3	15.8%		
	40k-50k	8	66.7%	4	33.3%	0	0.0%		
	>50k	14	73.7%	0	0.0%	5	26.3%		
BECKS Score	No Depressive Disorder	182	89.2%	10	4.9%	12	5.9%	11.664	0.07
	Mild depression	22	84.6%	2	7.7%	2	7.7%		
	Moderate depression	19	70.4%	2	7.4%	6	22.2%		
	Severe depression	7	70.0%	1	10.0%	2	20.0%		

4.6 ASSOCIATION OF INCOME AND ALCOHOL ABUSE

4.6.1 Employment
One third of the laid-off and retired (14%) had greater dependency compared to the employed (11%) or the self-employed (6%).

4.6.2 Income
Income does not discriminate between the employed and self-employed that form the majority of the sample.

Income does not tell us much but we could consider alternative approaches for determining social economic status participants (by what the respondents own). Results are summarized in Table 6 below.

Table 6: Association of Income and Alcohol Abuse

	Not at risk	Harmful/ Hazardous drinking	Alcohol dependence	Chi square	P value
Employment status					
Employed	91(78.4)	11(9.5)	13(11.2)	15.2	0.055
Self-employed	117(91.4)	3(2.3)	8(6.3)		
Retired	5(71.4)	1(14.3)	1(14.3)		
Never employed	17(100.0)	0(0.0)	0(0.0)		
Laid off work	2(50.0)	0(0.0)	1(25.0)		
Income					
1k-10k	91(87.5)	3(2.9)	9(8.7)	35.8	<0.001
10k-20k	69(92.0)	3(4.0)	3(4.0)		
20k-30k	27(79.4)	4(11.8)	3(8.8)		
30k-40k	16(80.0)	0(0.0)	3(15.0)		
40k-50k	8(66.7)	4(33.3)	0(0.0)		
>50k	14(73.7)	0(0.0)	5(26.3)		

4.7 ASSOCIATION OF DEPRESSION AND SOCIAL DEMOGRAPHICS

Table 7 below presents association between depression and socio-demographic variables. There is a significant difference between depression and age where depression levels worsens as age advances; respondents in age category of 18-21 years had less or no depression compared to those in the age category of 33 years and above.

Table 7: Association of Depression and Social Demographics

	Depression			
	Minimal-mild	Moderate-Severe	Chi square	P value
Age				
18-21 years	21(100.0)	0(0.0)	13.3	0.01
22-25 years	21(87.5)	3(12.5)		
25-29 years	26(86.7)	4(13.3)		
30-33 years	31(68.9)	13(28.9)		
>33 years	132(86.8)	17(11.2)		
Education				
None	3(60.0)	2(40.0)	9.7	0.046
Primary	30(81.1)	7(18.9)		
Secondary	83(81.4)	18(17.6)		
College	81(89.0)	9(9.9)		
University	34(91.9)	1(2.7)		
Gender				
Male	121(87.1)	15(10.8)	1.8	0.181
Female	110(82.7)	22(16.5)		
Income				
1k-10k	85(81.7)	18(17.3)	5.2	0.39
10k-20k	66(88.0)	8(10.7)		
20k-30k	27(79.4)	6(17.6)		
30k-40k	17(85.0)	3(15.0)		
40k-50k	12(100.0)	0(0.0)		
>50k	17(89.5)	1(5.3)		
Marriage				
Married	109(87.9)	13(10.5)	5.4	0.366
Cohabiting	16(94.1)	1(5.9)		
Single	82(82.0)	17(17.0)		
Divorced	4(80.0)	1(20.0)		
Separated	16(72.7)	5(22.7)		
Widowed	4(100.0)	0(0.0)		
Religion				
Catholic	83(79.8)	19(18.3)	6.5	0.091
Protestant	114(90.5)	10(7.9)		
Muslim	10(83.3)	2(16.7)		
Other	24(80.0)	6(20.0)		

4.8 ASSOCIATION OF DEPRESSION AND EMPLOYMENT

In Table 8 below, we picked, minimum or / no depression, Mild depression, Moderate depression and severe depression without combining the columns.

We found an association between depression and employment. Those laid-off work (1/3), and the retired (15%) had more depression compared to the employed (11%) or self-employed 6%, with a P value of 0.55 (borderline) as indicated in table 8 below.

Table 8: Association of Depression and Employment

	Depression					
	Minimal	**Mild**	**Moderate**	**Severe**	**Chi square**	**P value**
Age						
18-21 years	17(81.0)	4(19.0)	0(0.0)	0(0.0)	22.6	0.031
22-25 years	19(79.2)	2(8.3)	1(4.2)	2(8.3)		
25-29 years	22(73.3)	4(13.3)	3(10.0)	1(3.3)		
30-33 years	28(62.2)	3(6.7)	12(26.7)	1(2.2)		
>33 years	119(78.3)	13(8.6)	12(7.9)	5(3.3)		
Education						
None	2(40.0)	1(20.0)	1(20.0)	1(20.0)	24.5	0.017
Primary	27(73.0)	3(8.1)	4(10.8)	3(8.1)		
Secondary	68(66.7)	15(14.7)	13(12.7)	5(4.9)		
College	75(82.4)	6(6.6)	9(9.9)	0(0.0)		
University	33(89.2)	1(2.7)	1(2.7)	0(0.0)		
Employment						
Employed	89(76.7)	9(7.8)	13(11.2)	3(2.6)	21.7	0.042
Self-employed	97(75.8)	12(9.4)	13(10.2)	4(3.1)		
Retired	3(42.9)	2(28.6)	0(0.0)	2(28.6)		
Never employed	13(76.5)	3(17.6)	1(5.9)	0(0.0)		
Laid off work	3(75.0)	0(0.0)	1(25.0)	0(0.0)		
Gender						
Male	110(79.1)	11(7.9)	14(10.1)	1(0.7)	7.1	0.069
Female	95(71.4)	15(11.3)	14(10.5)	8(6.0)		
Housing						
Own	42(85.7)	2(4.1)	4(8.2)	0(0.0)	17	0.15
Rented	128(73.6)	16(9.2)	22(12.6)	5(2.9)		
Friends	10(76.9)	3(23.1)	0(0.0)	0(0.0)		
Parents	19(67.9)	4(14.3)	2(7.1)	3(10.7)		
Other	6(85.7)	1(14.3)	0(0.0)	0(0.0)		
Income						
1k-10k	71(68.3)	14(13.5)	13(12.5)	5(4.8)	15.4	0.424
10k-20k	62(82.7)	4(5.3)	7(9.3)	1(1.3)		

20k-30k	25(73.5)	2(5.9)	4(11.8)	2(5.9)		
30k-40k	14(70.0)	3(15.0)	3(15.0)	0(0.0)		
40k-50k	11(91.7)	1(8.3)	0(0.0)	0(0.0)		
>50k	17(89.5)	0(0.0)	1(5.3)	0(0.0)		
Married	100(80.6)	9(7.3)	10(8.1)	3(2.4)	11.2	0.74
Cohabiting	13(76.5)	3(17.6)	1(5.9)	0(0.0)		
Single	70(70.0)	12(12.0)	13(13.0)	4(4.0)		
Divorced	4(80.0)	0(0.0)	1(20.0)	0(0.0)		
Separated	14(63.6)	2(9.1)	3(13.6)	2(9.1)		
Widowed	4(100.0)	0(0.0)	0(0.0)	0(0.0)		
Religion						
Catholic	77(74.0)	6(5.8)	12(11.5)	7(6.7)	18.6	0.029
Protestant	102(81.0)	12(9.5)	8(6.3)	2(1.6)		
Muslim	8(66.7)	2(16.7)	2(16.7)	0(0.0)		
Other	18(60.0)	6(20.0)	6(20.0)	0(0.0)		

4.9 ASSOCIATION BETWEEN DEPRESSION AND HARMFUL ACOHOL USE

We assessed the association between depression and harmful/hazardous alcohol use combined with alcohol dependence and found that severity of depression was associated with increased alcohol abuse (p=0.024) as shown in the Table 9 below.

Table 9: Association between Depression and Harmful Alcohol Use

Categorized BECKS Score	BECKS SCORES SCORES		AUDIT			
			Harmful/Hazardous drinking - Alcohol dependence			
	N	%	N	%	Chi Square	P value
No depressive Disorder	182	89.2%	22	10.8%	9.5	0.024
Mild depression	22	84.6%	4	15.4%		
Moderate depression	19	70.4%	8	29.6%		
Severe depression	7	70.0%	3	30.0%		

4.10 MULTIVARIATE ANALYSIS FOR SOCIO-DEMOGRAPHIC ASSOCIATED WITH ALCOHOL ABUSE

On multivariate analysis alcohol abuse was associated with male gender (OR=10, 95% CI of OR [3.6 – 28.3], p<0.0001) and severity of depression (OR=5.5, 95% CI of OR [2.1 – 14.3], p<0.0001). The summary is shown in the Table 10 below.

Table 10: Multivariate Analysis for Socio-Demographic Associated with Alcohol Abuse

	Coefficient	S.E. of coefficient	P value	OR	95% C.I. for OR	
					Lower	Upper
Gender1	2.435	.599	.000	11.413	3.531	36.886
Age	.181	.204	.376	1.198	.804	1.786
Marriage	.208	.148	.160	1.231	.921	1.646
Education	-.028	.263	.915	.972	.580	1.630
Employment	-.458	.333	.170	.633	.329	1.216
Income	.185	.159	.246	1.203	.880	1.643
Religion	.159	.230	.489	1.172	.747	1.839
Housing	-.114	.266	.669	.893	.530	1.503
BECKS Score	1.586	.540	.003	4.883	1.693	14.077

CHAPTER FIVE
DISCUSSION

In this study, the overall prevalence of AUDs scores ≥8 in this study was (14%), defined by an AUDIT score ≥8. AUDs were present in almost one quarter of males, and less than 5% of females. Males were identified as hazardous drinkers compared to females 3.8% and also more likely to be dependent on alcohol than females.

Gender differences in alcohol consumption and attention to the ways that such gender differences both cut across are influenced by cultural differences (Van, 2005). Male drinkers consume larger quantities of alcohol than female drinkers do, and male drinkers experience more behavioral problems related to their drinking than female drinkers do (Nolen, 2004). Men misuse alcohol more than women. In a study conducted among Scottish Highlanders, where female drinking is particularly deplored but nonetheless occurs, alcoholic beverages consumed by women are often conveniently granted a sort of honorary 'non-alcoholic' status, such that their consumption does not count as 'drinking' (McDonald, 1994; Purcell, 1994). A weaker, sweeter version is considered suitable for women, while 'strong' and 'fierce', is a man's drink. Fewer 4.6% females had 12 or more days of heavy drinking (5 drinks per day), compared to 16.5% of men. This result indicate that men use alcohol in terms of everyday transitions; where alcohol is used to mark the transition from work to play and where drinking is associated with recreation and irresponsibility, thus men are more inclined to have higher levels of alcohol-related problems. Heavy drinking is associated with risky sexual behaviors. Further, in Kenya, alcohol consumption frequently occurs in settings (e.g., bars, clubs, and informal drinking places) where unprotected sex with several partners is likely to occur as is indicated by Kalichman et al. 2007b. This has also been shown in a Kenyan study (Mackenzie and Kiragu 2007) where current drinkers were four times more likely to have multiple sexual partners than nondrinkers. Other studies have shown that alcohol-serving establishments often

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are also the places where sex partners meet, resulting in the formation of "sexual networks" in which HIV can spread rapidly (Chersich and Rees 2010; Weir et al. 2003). Finally, alcohol dependence may lead to trading sex for drinks, as has been reported in South Africa (Kalichman et al. 2007a).

Our results in this study are also comparable to other findings from hospitals in Africa where the prevalence of AUDs varies from 12% in a teaching hospital in Nigeria (Farly, et al., 2010), 15% in a Ugandan university teaching hospital (Martinez, et al., 2008). Other studies from Africa also show a substantially higher prevalence of AUDs in PLWHA. Estimates from a case study control study of factors associated with late presentation to HIV/AIDS care among PLWHIV in South Wollo Hospital, Ethiopia report 33.8% and another study from Jimma Hospital, Ethiopia on defaulters from antiretroviral treatment among PLHIV 36.5% (Deribe, Hailekiros, Biadgilign et al. 2008), the two studies did not use a standardized questionnaire to define AUDs. In Nigeria the prevalence of AUDs in PLWHA was 39.4% (Goar et al, 2011).

In this study, harmful alcohol use was found in 5.5% of the total participants, which differs substantially from a similar study carried out in Nigeria in which the prevalence was 28.8% (Goar et al., 2011). In this study, hazardous alcohol use was found in 14% of participants. This is slightly lower than the prevalence of hazardous drinking found in similar studies from Uganda (15.4%) (Martinez et al., 2008) and is higher in similar studies from Nigeria (10.6%) (Goar et al., 2011).

The prevalence of dependence 8.5% found in our study was higher than the result from a study of alcohol use disorders and associated factors among people living with HIV attending services in south west Ethiopia of 5.1% (Matiwos & Markos et al. 2014). Across Africa, reports of alcohol use among HIV positive persons show variable rates. Sebit et al. observed a prevalence of alcohol use among HIV positive adult outpatients in Zimbabwe of 24.3% (Sebit

et al. 2003) while Shaffer et al. recorded 54% of both HIV positive and negative public clinic patients in Kenya as hazardous drinkers according to the AUDIT (Shaffer et al. 2004). The reason for the difference may be due to the different tools used in this study (AUDIT vs. CAGE), as the CAGE is used to detect severe alcohol use disorders (alcohol dependence rather than harmful use or hazardous drinking). Another reason would be the application of a lower AUDIT cut-off point than the recommended cut-off (lower than 8). Another reason could be cultural differences.

The study found that 23.8% of participants overall had a score ≥13 on the BDI indicative of depressive disorders, with more than half (14.1%) having moderate-severe depressive symptoms. This prevalence of depressive symptomatology has been reported in other African countries studies among PLWHA. This has been shown to be mostly above 20%: Els *et al*. (1999), Olley, Seedat, Nel & Stein (2004) reporting 35%, and Sebit *et al*. (2003) reporting 27%. Other studies in Africa have shown higher prevalence of 64% (Mfusi & Mahabeer, 2000; Shisana, Rehle, Simbayi, Parker, Zuma, Bhana *et al*., 2005; Kaharuza *et al*., 2006; Stangl *et al*., 2007). Study findings may differ as a result of the ways depression and alcohol are measured (Graham, Massak, Demers, & Rehm, 2007).

Our study found that in Correlates of depression, alcohol abuse was associated with severity of depression (p=0.024). Male gender, employment status and income level had statistically significant associations with alcohol abuse. Those that were more likely to report alcohol abuse problems were male respondents (p<0.001), retired and unemployed respondents (p=0.05). This study revealed that male drinkers also faced other pressures, including economic crisis, loss of income, retirement or unemployment and terminal illness. This finding is comparable to data from community samples which have suggested that men are more likely to use alcohol as a means of coping with depression than women. However

women may be more vulnerable to depressive symptoms associated with heavy alcohol use (Nolen-Hoeksema, 2004).

Another association was in respondents whose monthly income was higher than Kenya shillings 50,000. The more income people have, the more educated they are and the higher their social status or class, the more likely they are to drink alcoholic beverages (Holder, 1998). This association contradicts the one observed between alcohol abuse and employment and also reports in literature of a negative association between higher income and alcohol abuse. A probable explanation could be the objective self-report of employment status compared to non-verifiable reporting of income. There is need for studies designed using verified and dependable measures of social economic status to clarify associations between alcohol consumption and income or social economic status. This relationship between being male, being depressed and abusing alcohol suggests that men have poorer coping mechanisms and are therefore more susceptible to alcohol abuse.

This study found AUDs to be higher among male gender (23.7%) as compared to the female gender (3.8%); which is in agreement with other studies done in different countries (Farly, 2010, Goar et al, 2011). This strong association with male gender is similar to findings of studies of hazardous alcohol use in patients with and without HIV conducted in South Africa (Myer, et al., 2008) and Kenya (Myer et al., 2004). Both the retired (28.6%) and the laid-off (33.3%) had statistically significant association with alcohol use disorder. This indicated that, loss of income and their livelihood may have contributed to their alcohol use disorder. On multivariate analysis alcohol abuse was associated with male gender (OR=10, 95% CI of OR [3.6 − 28.3], p<0.0001) and severity of depression (OR=5.5, 95% CI of OR [2.1 − 14.3], p<0.0001). Severity of depression was also linked to AUD. This can be postulated to mean that individuals who drink alcohol do so to reduce emotional stress. This may be self-medicating with alcohol as has been documented by Grant et al., 2009, and a link has been

shown where depression predicted alcohol use disorder and alcohol use disorder predicted depression (Marmorstein, 2009).

The reasons for this interrelationship are complex. A cause-effect relationship could not be established because our study employed a cross-sectional study design. Research supports an association between alcohol use and depressive symptoms among HIV patients, few studies have examined whether depressive symptoms predict subsequent drinking, especially among HIV-infected patients or vice versa (Palfai, 2013).

Limitations

Data were collected in only one CCC, which may not be representative of AUD and depression disorder in PLWHA in Kenya. The study was a self-reported data; there exists a reporting bias in these findings. The reliability of reporting risk behaviors in care settings is sometimes questionable. This study focused on current depressive symptomatology rather than a current or lifetime DSM-IV diagnosis of a mood disorder. This study employed a cross-sectional design; thus a cause-effect relationship could not be established. A longitudinal follow-up study could provide better insight into precise nature of the relationship between AUD, depression and socio-demographic variables in PLWHA.

Recommendations

Our study brings to light the need for routine alcohol screening as an integral component of HIV care.

AUDs treatment should be introduced as part of the HIV/AIDS intervention.

This study suggests the application of a comprehensive treatment approach that includes assessment and management of depressive symptoms in conjunction with alcohol use disorder and HIV treatment.

Given the high prevalence of depression and AUDs among individuals seen at CCC, there is a clear need for further research into the determinants of depression in these populations, as well as simple screening tools which can be used to identify psychopathology in HIV-infected individuals, and ultimately, support the development of strategies to effectively manage these co-morbidities not only in specialized clinical but in primary health care settings.

Future work could usefully study prevalence in an HIV-negative control group.

Conclusion

These results indicate that there is a significant burden of AUDs and depressive disorders among HIV-infected individuals attending the specialized CCC at KNH. We demonstrated that men are more vulnerable to AUDs and need special services to address the problem. This study shows that AUDs are associated with depression and interventions need to be put in place in HIV care settings to reduce alcohol consumption. The high prevalence of AUDs detected in our study highlights the need to integrate delivery of effective methods in which standardized assessment and treatment practices might be adapted to better address alcohol use disorders in CCC, patients.

Activity	Nov 2013	Dec 2013	Jan 2014	Feb 2014	Mar 2014	April 2014	May 2014	Jun 2014	Jul 2014	Aug 2014
Formulate and clarify research topic	▓									
Read literature	▓									
Define objectives clearly and finalize objectives	▓	▓								
Proposal preparation		▓	▓							
Develop questionnaire				▓						
Defense of research proposal					▓					
Ethics					▓	▓	▓			
Piloting the questionnaire								▓		
Administer questionnaire								▓		
Data Analysis and drafts preparation								▓	▓	
Final Project Defense									▓	▓
Submission of corrected final copy									▓	▓

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Budget and Budget Justification

Description	Item	Duration/Number	Cost (Kshs)	Total
a) Personnel				
Data Analyst	1	30 days / 1 month	60,000	60,000
			Sub-total	**60,000**
b) Supplies and Equipment				
		A4 foolscaps	1Rim @ksh.400	400
		A4 printing papers	3 Rim @ksh.600	1,800
		HB Pencil	1 dozen @ksh.240	240
		Ball pens	1 dozen @ksh.200	200
		Rubber	2 piece @ksh.150	300
		Ruler	1 piece @ksh.100	100
		Felt pen	2 pieces @ksh.125	250
		Stapler	1 piece @ksh.500	500
		Paper punch	1 piece @ksh.500	500
		Staple pins	1 pack @ksh.250	250
		External Disc	1piece @ksh.6,900	6,900
		CD-RW	10 pieces @ksh.30	300
Consent form	100	2 pages	@ksh.3	600
Screening tool	100	9 pages	@ksh.3	2,700
			Sub-total	15,040
c) Travel expenses				
Return trip from residence to KNH and back	1	Return trip 30days	Per day @KSh.500	15,000
			Sub-total	**15,000**
d) Operating Expenses				
	Typing services	80 pages	@ksh.30	2,400
	Printing services	80 pages	@ksh.10	800

	Photocopying services	5 copies of 80 pages	@240 per copy	1,200
	Binding services	5 copies of 80 pages	@100 per copy	500
	Communication – Airtime	Airtime and Internet bundles	@2,000	2,000
			Sub-total	**6,900**
			Total	**97,340**
			Add 10% Contingency	**9,734**
			Grand total	**107,074**

APPENDIX 1: Informed Consent Explanation Form

My name is Anne Wanja Kibera, a Master of Science student in Clinical Psychology, in the Department of Psychiatry, University of Nairobi.

Permission is requested from you for enrolment in a medical research study. You should understand the following general principles, which apply to all medical research, whether normal or patient volunteers:

   i.   Your agreement to enroll is voluntary

   ii.   You may withdraw from the study at any time

   iii. Refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled.

   iv.   After you read the explanation, please feel free to ask any questions that will allow you to understand clearly the nature of the study.

Title: The Prevalence of Alcohol Use Disorder and Depression in Patients Attending CCC, at Kenyatta National Hospital.

Institution: Department of Psychiatry, Faculty of Medicine, College of Health Sciences, University of Nairobi.

Investigator: Anne Wanja Kibera

Supervisors: 1. Dr. Lincoln I. Khasakhala

                        2. Dr. Wangari Kuria

Objective of the Study: To determine the prevalence of alcohol use disorder and depression in patients attending Comprehensive Care Centre (CCC) in Kenyatta National Hospital.

Study Procedure: To be eligible in this study, you must be 18 years and above; and you must be willing to participate and give consent. I will ask you questions concerning your current living conditions, your mental health currently and over the past years and the events that has taken place in your life. I will also ask you questions pertaining to your alcohol use. This will be in form of questionnaires, and no invasive procedures will be carried out in the course of the study. If you agree to participate in this study, you will answer a set of questions for about 30 minutes.

Benefits: Participating in this study may not benefit you directly, but it will help us learn more about prevalence of alcohol use disorders and depression in patients attending the Comprehensive Care Centre at Kenyatta National Hospital. You may find answering some of the questions upsetting.

It is hoped that the results of this study will help in the following ways:

i.   Those found with depressive symptoms will be referred for further treatment within CCC facility

ii.   Those found with alcohol use disorders will be referred for further treatment within CCC facility

iii. Policies that will ensure integration of mental health interventions into HIV/AIDS Comprehensive Care Clinics as well as routine screening of alcohol use disorders and depression in patients attending comprehensive care clinics in the country will be put in place in the future.

Confidentiality: All information collected will be kept confidential, and your name will not be used in the study or in any resulting publications. However, a breach of confidentiality may occur only when your life and/or the lives of others are in danger.

Ethical considerations: This protocol is designed with the client's confidentiality in mind. Participants found to need treatment or other intervention will be referred for treatment within the CCC facility.

Risks: Some questions may be uncomfortable and make you remember painful experiences.

Contact: If you have any questions regarding the study or participation in this study, you can call any of my supervisors:

Dr. Lincoln. I. Khasakhala on telephone No. 0722-860485
Dr. Wangari Kuria on telephone No. 0722-755681
You can also contact the researcher on telephone No. 0722-735357
Thank you for your assistance

Researcher's Name- Anne Kibera
Contact - Tel 0722- 735-357
MSc. Clinical Psychology
Department of Psychiatry
University of Nairobi

Consent Form

Participants code: _____   Date: _____

Subjects Statement: I, the undersigned, do hereby volunteer to participate in this study whose nature and purpose has been explained to me by Anne Wanja Kibera. I understand that this is my choice. If I change my mind, I understand that I will continue to receive medical care.

Subjects Signature (or mark of consent)*: _____

Date: _____

Witness Signature: _____

Date: _____

Anne W. Kibera

Researchers Signature: _____

Date: _____

*subject may sign or provide verbal consent in the presence of a witness who then signs.

APPENDIX II: SOCIODEMOGRAPHIC DATA OF PATIENT

Instructions

- Tick where appropriate
- Fill in the blank spaces appropriately
- Give the correct information

Date..   Code number...........................

1. What is your gender?

   ☐ Male

   ☐ Female

2. What is your age category?

   ☐ 18-21 years

   ☐ 22-25 years

   ☐ 26-29 years

   ☐ 30-33 years

   ☐ 34 and above years

3. Marital status

   ☐ Married

   ☐ Cohabiting

   ☐ Single

   ☐ Divorced

   ☐ Separated

4. Level of education

   ☐ None

   ☐ Primary

   ☐ Secondary

   ☐ College

   ☐ University

5. Employment

   ☐ Employed

   ☐ Self-employed

   ☐ Retired

   ☐ Never employed

☐ Laid off work

6. Income bracket in Kenya Shillings per month

☐ 1, 000-10,000

☐ 10,000-20,000

☐ 20,000-30,000

☐ 30,000-40,000

☐ 40,000 -50,000

☐ 50,000 and above

7. Religion

☐ Catholic

☐ Protestant

☐ Muslim

☐ Other

8. Housing

☐ Own

☐ Rented

☐ Friends

☐ Parents

☐ Other

9. STI/HIV counseling and testing history

VCT site ☐   Health Centre ☐

Maternity Clinic/Hospital ☐

Other ☐

10. How did you learn about the diagnosis

☐ Self-referral to VCT

☐ Referred by medical workers due health problems or

☐ Referred by family member

☐ Other

11. How was the news broken to you?

☐ By the VCT counselor

☐ By medical worker after counseling   ☐ no counseling was given

☐ By the nurse after counseling   ☐ no counseling was given

☐ Other

12. Type of treatment offered

- ☐ Counseling only
- ☐ Out-patient treatment
- ☐ In-patient treatment
- ☐ ARV's treatment
- ☐ Referred to CCC
- ☐ Other

APPENDIX III: ALCOHOL USE DISORDER IDENTFICATION TEST (AUDIT)

AUDIT	Scoring system					Your score
	0	**1**	**2**	**3**	**4**	
How often do you have a drink containing alcohol?	Never	Monthly or less	2 - 4 times per month	2 - 3 times per week	4+ times per week	
How many units of alcohol do you drink on a typical day when you are drinking?	1 -2	3 - 4	5 - 6	7 - 9	10+	
How often have you had 6 or more units if female, or 8 or more if male, on a single occasion in the last year?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
How often during the last year have you found that you were not able to stop drinking once you had started?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
How often during the last year have you failed to do what was normally expected from you because of your drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
How often during the last year have you needed an alcoholic drink in the morning to get yourself going after a heavy drinking session?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
How often during the last year have you had a feeling of guilt or remorse after drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
How often during the last year have you been unable to remember what happened the night before because you had been drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
Have you or somebody else been injured as a result of your drinking?	No		Yes, but not in the last year		Yes, during the last year	
Has a relative or friend, doctor or other health worker been concerned about your drinking or suggested that you cut down?	No		Yes, but not in the last year		Yes, during the last year	

Scoring: 0 – 7 Lower risk, 8 – 15 Increasing risk, 16 –19 Higher risk, 20+ Possible dependence

SCORE

APPENDIX IV: BECKS DEPRESSION INVENTORY

BDI (Beck's Depression Inventory)

On this questionnaire there are groups of statements. Please read each of the statements carefully, then pick out the one statement in each group which best describes the way that you have been feeling the past week, including today

Circle the number besides the statements in each group before making your choice

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

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

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

4.
   0. I get 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 guilty most of the time
   3. I feel guilty all 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 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

8.
   0. I don't have thoughts of killing myself
   1. I have thoughts of killing myself, but I would not carry them out
   2. Would like to kill myself
   3. I would kill myself if I had the chance

9.
   0. I don't cry any more than unusual
   1. I cry more now than I used to

2. I cry all the time
3. I used to be able to cry, but now I can't even though I want to

10.
   0. I am no more irritated now than I ever was
   1. I get annoyed or irritated more easily than I used to
   2. I feel irritated all the time now
   3. I don't get irritated at all by the things that used to irritate me

11.
   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

12.
   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 any more

13.
   0. I don't feel I look any worse than I used to
   1. I am worried that I am old or unattractive
   2. I feel that there are permanent changes in my appearances that make me look unattractive
   3. I believe that I look ugly

14.
   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

15.
   0. I can sleep as well as usual
   1. I don't sleep as well as I used to
   2. I get tired from doing almost anything
   3. I am too tired to do anything

16.
   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

17.
   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

18.
   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

19.
   0. I am no more worried about my health than usual
   1. I am very worried about my physical problems such as aches and pains; or upsets stomach; or constipation
   2. I am very worried about my physical problems and it's hard to think of much else
   3. I am worried about my physical problems that I cannot think about anything else

20.
   0. I have not noticed any recent change in my interest in sex
   1. I am less interested in sex than before
   2. I am less interested in sex now
   3. I have no interest in sex completely

BECKS DEPRESSION INVENTORY - KISWAHILI VERSION

Nambari_____   **Tarehe**_____

Yafuatayo ni mafungu ya sentensi. Tafadhali soma kila fungu kwa makini. Chagua kutoka katika kila fungu sentensi ambayo yaelezea vyema ulivyokuwa ukihisi JUMA LILILOPITA NA UNAVYOHISI LEO! Ashiria sentensi moja au zaidi ya moja uliyochagua katika kila fungu kwa <u>kuweka alama</u> mviringo juu ya nambari ya sentensi hiyo. **Hakikisha umesoma sentensi zote katika kila fungu kabla ya kuchagua sentensi iliyo sambamba na unavyohisi**

1.
- 0. Sina huzuni
- 1. Nina huzuni
- 2. Nina huzuni wakati wote na siwezi kijiondoa katika hali hii ya huzuni
- 3. Nina huzuni sana mpaka siwezi kustahimili/kuvumilia

2.
- 1. Sijavunjika moyo hasa na siku za usoni
- 2. Nahisi nimevunjika moyo na siku za usoni
- 3. Nahisi sina ninalo tarajia siku za usoni
- 4. Nahisi nimekata tamaa ya siku za usoni, na naona mambo hayawezi kuwa bora zaidi

3.
- 1. Sijihisi kama nimeanguka maishani
- 2. Nahisi nimeanguka maishani zaidi ya mtu wa kawaida
- 3. Nkiangalia maisha yangu yaliopita naona nimeanguka sana
- 4. Nahisi nimeanguka kabisa maishani

4.
- 1. Naridhika na mambo kama ilivyo kawaida yangu
- 2. Sija furahi mambo kama nilivyokuwa nikifurahia
- 3. Sitosheki tena kikamilifu na jambo lolote
- 4. Sitosheki wala sichangamshwi na chochote tena

5.
- 1. Sihisi hasa kama nina hatia fulani
- 2. Nahisi nina hatia wakati mwingine
- 3. Nahisi nina hatia wakati mwingi
- 4. Nahisi nina hatia wakati wote

6.
- 1. Sihisi kama nina adhibiwa
- 2. Nahisi kama naweza kuadhibiwa
- 3. Natarajia kuadhibiwa
- 4. Nahisi nina adhibiwa

7.
- 1. Sihisi kama nimeikasirikia nafsi yangu
- 2. Nimeikasirikia nafsi yangu
- 3. Najidharau
- 4. Najichukia

8.
- 1. Sihisi kama mimi ni mbaya zaidi ya mtu yeyote yule
- 2. Najisuta (kujitoa makosa) sana katika makosa yangu ama udhaifu wangu
- 3. Najilaumu wakati wote kwa makosa yangu
- 4. Najilaumu kwa ovu lolote linalo tendeka

9.
1. Sina wazo lolote kujiua
2. Nina wazo la kujiua
3. Ningetaka kujiua
4. Nitajiua nikipata nafasi

10.
1. Silii siku hizi zaidi ya vile ilivyo kawaida yangu
2. Nalia siku hizi zaidi ya ilivyokuwa kawaida yangu
3. Nalia wakati wote siku hizi
4. Nilikuwa nikiweza kulia, lakini sasa hata nikitaka kulia siwezi

11.
1. Sikasirishwi kwa urahisi siku hizi zaidi ya ilivyo kawaida yangu
2. Nakasirishwa kwa urahisi zaidi ya ilivyokuwa kawaida yangu
3. Nahisi nimekasirishwa wakati wote siku hizi
4. Sikasirishwi kamwe na mambo ambayo yalikuwa yakinikasirisha

12.
1. Sijapoteza hamu ya kujihusisha au kujumuika na watu
2. Hamu yangu ya kujihusisha na watu imepungua zaidi ya ilivyokuwa
3. Nimepoteza sana hamu yangu ya kujihusisha na watu
4. Nimepoteza hamu yangu yote ya kujihusisha na watu

13.
1. Ninafanya uamuzi kuhusu jambo lolote kama kawaida
2. Ninahairisha kufanya uamuzi zaidi ya vile nilivyokuwa nikifanya
3. Nina uzito mkubwa wa kufanya uamuzi kuliko hapo awaki
4. Siwezi tena kufanya uamuzi wa jambo lolote lile

14.
1. Sihisi kuwa naonekana vibaya zaidi ya nilivyokuwa
2. Nina wasi wasi kuwa naonekana sivutii
3. Ninahisi kuwa kuna mabadiliko yasio ondoka kwenye umbo langu yanayofanya nisivutie
4. Nina amini kuwa nina sura mbaya

15.
1. Nawaza kufanya kazi kama vile ilivyokuwa hapo awali
2. Nilazima nifinye bidii, ndipo nianze kufanya jambo lolote
3. Inabidi nijilazimishe sana ili niweze kufanya jambo lolote
4. Sitaweza kabisa kufanya kazi yoyote

16.
1. Ninalala kama kawaida yangu
2. Silali vyema kama nilivyo kuwa nikilala hapo awali
3. Naamka mapema kwa saa limoja au masaa mawili, ambayo sio kawaida yangu, halafu ni vigumu kupata usingizi tena
4. Naamka mapema zaidi ya masaa mawili, ambayo sio kawaida yangu, halafu siwezi kupata usingizi tena

17.
1. Sichoki zaidi ya nilivyokuwa nikichoka hapo awali
2. Nachoka kwa urahisi zaidi ya kawaida yangu
3. Nachoshwa (Nachokeshwa), karibu na kila jambo ninalofanya
4. Ninachoka sana hata siwezi kufanya lolote

18.
1. Hamu yangu ya chakula sio mbaya zaidi ya vile ilivyokuwa hapo awali
2. Hamu yangu ya chakula sio mbaya zaidi kama vile ilivyokuwa hapo awali
3. Hamu yangu ya chakula ni mbaya zaidi siku hizi
4. Sina tena hamu ya chakula hata kidogo

19.
1. Sijapunguza uzito wa mwili wa kuonekana hivi karibuni
2. Nimepunguza uzito wa mwili zaidi ya kilo mbili
3. Nimepunguza uzito wa mwili zaidi ya kilo tano
4. Nimepunguza uzito wa mwili zaidi ya kilo saba

Ninakula chakula kiasi kidogo kwa kusudio la kujaribu kupunguza uzito wa mwili
Ndivyo_____   Sivyo_____

20.
1. Sina wasiwasi usio wa kawaida kuhusu haki yangu ya afya
2. Nina wasiwasi kuhusu shuda za mwili kama vile maumivu hapa na pale; au shida ya tumbo,au kufunga choo
3. Nina wasiwasi kuhusu matatizo ya mwili mpaka inakuwa ni vigumu kuwaza jambo lengine lolote
4. Nina wasiwasi kuhusu matatizo ya mwili mpaka siwezi kuwaza jambo lengine lolote

21.
1. Sijaona mabadiliko yoyote hivi karibuni kuhusu hamu yangu ya kufanya mapenzi
2. Hamu yangu ya kufanya mapenzi imepungua zaidi ya vile ilivyokuwa
3. Hamu yangu ya kufanya mapenzi imepungua sana siku hizi
4. Nimepoteza kabisa hamu yangu ya kufanya mapenzi

APPENDIX V: LETTER OF APPROVAL FROM ETHICS AND RESEARCH COMMITTEE

APPENDIX VI: STUDY REGISTRATION CERTIFICATE FROM KENYATTA NATIONAL HOSPITAL