UNIVERSITY OF NAIROBI

DEPARTMENT OF PSYCHIATRY

ASSOCIATION OF, PERCEIVED STRESS AND SUBSTANCE USE DISORDERS, AMONG STUDENTS AT THE UNIVERSITY OF NAIROBI

A RESEARCH PROPOSAL SUBMITTED IN PARTIAL FULLFILMENT OF THE DEGREE OF MASTERS OF MEDICINE IN PSYCHIATRY

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DECLARATION

Dr Gordon Ambayo, do hereby declare that this research is my original work carried out in part-fulfilment of the requirement of the award for the Degree of Master of Medicine in Psychiatry (MMed. Psych.) of University of Nairobi, and further, that I have not presented the same for the award of any other degree or to any other university.

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DEDICATION

I dedicate this work to my late father, Apollo Ambayo Otiang'a, my mother Hellen Ago Ambayo, my wife Selestine Otieno, my children Joseph, Teresa, Lena, Allan, Curtis and colleagues at the department of Psychiatry, University of Nairobi

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ABBREVIATIONS AND ACRONYMS

ASSIST: Alcohol, Smoking and Substance Involvement Screening Test.

AUDIT: Alcohol use disorder identification test

DSM: Diagnostic and statistical manual of mental illness.

H.P.A: Hypothalamo-pituitary axis

M.O.H: Ministry of Health Kenya

NACADA: National Authority for the Campaign Against Drug Abuse

NIDA: National Institute on Drug Abuse (NIDA)

PSS: Perceived Stress Scale

SAMHSA: Substance abuse and mental health services administration

SPSS: Statistical Package for Social Sciences

DEFINITION OF TERMS

Abuse: Use of any drug usually by self- administration, in a manner that deviates from approved social or medical pattern (Sadock, Sadock and Ruiz, 2014).

Addiction: The repeated and increased use of a substance, the deprivation of which gives rise to symptoms of distress and an irresistible urge to use the agent again and leads also to physical and mental deterioration (Sadock et al, 2014).

Alcohol: Alcohol means a product containing ethyl alcohol or ethanol. It is a central-nervous-system depressant that slows the activity of the brain and spinal cord (Medicine Net 2007).

Amphetamines: A group of behavioural stimulants that temporarily increase energy and mental alertness (NACADA, 2010).

Anxiety: A diffuse, vague and unpleasant feeling that one is in danger (Frank,2015).

Binge drinking: Binge drinking is defined as episodic excessive drinking pattern of drinking of five or more drinks on one occasion at least once in the previous 30 days (Hales, Yudofsky and Roberts, 2015)

Cannabis   Marijuana—also called *weed, herb, pot, grass, bud, ganja, Mary*

(Marijuana) *Jane*, and a vast number of other slang terms—is a greenish-gray mixture of the dried flowers of *Cannabis sativa*. Some people smoke marijuana in hand-rolled cigarettes called *joints*; in pipes, water pipes (sometimes called *bongs*), or in *blunts* (marijuana rolled in cigar wraps) (NIDA,2018).

Codeine: This is an alkaloid found in opium and is also produced from morphine. It is medically prescribed for the relief of moderate pain and cough suppression. Codeine products are derived from legitimate sources and are encountered in the illicit market.

Chronic stress: Chronic stress is the response to emotional pressure suffered for a prolonged period over which an individual perceives he or she has control.

Drug: A drug is a chemical substance or a mixture of substance which when introduced in to the living organism may modify one or more of its functions (Rang, Ritter, Fowler and Hendersn, 2016)

Drug Abuse: A pattern of drug use that leads to adverse effects on the health and social environment (Ndetei, 2014).

Inhalants: These are substances present in a variety of household and industrial products such as solvents (paint thinners, gasoline, glues); gases (butane, propane, aerosol propellants, nitrous oxide); nitrites (isoamyl, isobutyl, cyclohexyl); laughing gas, poppers, snappers and whippets. They are inhaled through the nose or mouth by sniffing, huffing or bagging (M.O.H, 2017).

Khat: Khat (Catha edulis), also known as qat, gat, chad, miraa, is a flowering plant native to tropical East Africa and the Arabian Peninsula. Khat contains an amphetamine-like stimulant that is said to cause excitement, loss of appetite, and euphoria (Ndetei,2014).

Kuber: Kuber is a central nervous stimulant, containing nicotine, that causes euphoria, relief of tension and enhanced laughter (M.O.H, 2017)

Perceived Feelings or thoughts that an individual has, about the amount of stress

Stress: They are undergoing at a given point in time or over a given time period is known as perceived stress (Philip, 2013).

Stimulants: Are psychoactive drugs which induce temporary improvements in either .mental or physical function or both (Ndetei, 2014).

Stress: Stress is a physical and psychological response to harmful or potentially harmful circumstances (Ndetei,2006).

Stressors: A stressor is a stimulus which causes stress, e.g bereavement, divorce and robbery (Ndetei, 2006).

Substance Substance use disorders are characterized by a pattern of continued

Use Disorder: Pathological use of psychoactive substance that results in repeated

adverse physiological, behavioural and social consequences (M.O.H,

2017)

Tobacco: Tobacco is a plant grown for its leaves, which are dried and fermented before being packaged as tobacco products. Tobacco contains nicotine,an ingredient that can lead to addiction, which is why so many people who use tobacco find it difficult to quit. There are also many other potentially harmful chemicals found in tobacco or created by burning it (NIDA,2018).

ABSTRACT

Various studies have separately reported a high prevalence of perceived stress and a high prevalence of alcohol and drug use among university students in Kenya. The study investigated the association between perceived stress and alcohol and drug use among undergraduate students of the University of Nairobi.The main objective was to investigate the association between perceived stress and alcohol and drug use disorder.This was a cross sectional study carried out in six colleges of the University of Nairobi. Multistage stratified sampling was used to randomly select participants. One faculty from each of the six colleges was randomly selected for the study and students in the selected faculty were randomly selected from the faculty register. Socio-demographic data was collected using self-administered structured questionnaire. Data on perceived stress were collected using Cohens perceived stress scale. Data on alcohol and drug use was collected through interview using ASSIST questionnaire. The Statistical Package for the Social Sciences (SPSS) version 21 was used for data analysis.

A total of 371 (96.6%) respondents participated out of 384 randomly selected. Mean perceived stress score for all respondents was 16.7 (S. D 3.8). Female respondents mean perceived stress was 17.9(S. D 3.6) and was significantly higher than perceived stress for male respondents of 15.7 (S. D 3.8) $p<0.05$. Among those using alcohol and tobacco, mean perceived stress was 19.6 (S. D 10.4) and tobacco 20.2 (S. D 8.8) respectively. Mean levels for both groups was significantly higher than those for those who do not use. There was no association between perceived stress levels and age, place of residence, religion and module of study.

Perceived stress was significantly associated with alcohol and tobacco use among the students of the University of Nairobi. There is a need to scale up education on prevention of alcohol and drug use among the students. The University of Nairobi management needs to start stress management programs for the students.

CHAPTER ONE

1.1 Introduction

Stress is used in a variety of settings. This may include workplace, in the community and academic. A limited amount of pressure helps individuals put up excellent performance. However, when pressure exceeds an individual's ability to cope, distress can occur. Distress, may reduce our ability to cope with situations. In the current world completion among students is high. The students therefore face more stress than in the past. The stress, can be due to, academic issues, peer, teacher or parental pressure (Sreeramareddy et al, 2007). Having stress is normal part of life. Throughout the lifespan, a person experiences stress. Not all stress is negative and some level of stress is necessary for normal functioning (Frank, 2015).

The feeling by an individual, that the stress demands exceeds his or her own and social resources at their disposal, leads to negative stress (Ndetei, 2015). Anything that one feels causes lack of balance in the harmony in one's life, is considered as stress. Stress is therefore a perceived concept. Things happening, experiences, or environmental stimulus to a person, that leads to stress is known as a stressor. The events or experiences are perceived as threats or challenges to the individual and can be either physical or psychological. Adverse effects on an individual's life, heart disease and anxiety can result from exposure to chronic stressors, perceived as unmanageable. (Collins et al, 2014).

American Psychiatric Association, classify stress into three categories. These are: acute stress, episodic acute stress, and chronic stress. Acute stress which is the most common is caused by recent stressors and expected stressors of the near future. Despite being thrilling and exciting in low doses, excess of it can be overwhelming. Common symptoms of acute stress include, anger or irritability, anxiety and depressed mood, myalgia, heartburn, passing excessive gas, diarrhoea, high blood pressure and palpitations., palmer hyperhidrosis and palpitations. Lack of coping resources for managing chronic stress can result in the person being anxious and depressed (Schlotz et al, 2011). Ability to cope with stress, also known as resilience is evidenced by how one adapts to the psychological and emotional outcome of stress response (Alim et al, 2012).

Stress experienced by university students, can affect their academic, psychological and physical state adversely (Dahlin et al, 2005). Too much academic work, pressure for success rivalry with colleagues and worries of what the future has are some of the stressors university students meet. (Vaez et al, 2006). All these pressure related distresses can result in psychopathology among the university students, overstretching their coping mechanism. University authorities have been more keen on the mental wellbeing of university students during the recent years (Alzahem et al, 2011).

In a German university, students with healthy mental status in first year were 47.3%. This decreased to 36.9% in the year two and 17.6% in year five of their studies 17.6% in the fifth year and an increase in the percentage of students at risk for burnout (Voltmer, 2012). The decline in quality of health and increase in risky patterns, which can cause

poor coping mechanisms and externalised by affected person by starting to use psychoactive substances particularly in students. Indulging in substances indicates a need for prevention and health promotion services for students paying attention to their behaviour. Feelings or thoughts that an individual has, about the amount of stress they are undergoing at a given point in time or over a given time period is known as perceived stress (Philip, 2013).

Majority of people use psychoactive substances without encountering difficulties, although a small percentage of them develop substance related disorders that can lead to considerable burden and costs (Semple, et al 2013). The reasons for substance use are varied, and may include: search for a 'high', search for repeat of initial pleasurable effects, cultural norm in some cultures, self-medication for anxiety, social phobia, insomnia, symptoms of psychotic illness, and to prevent development of withdrawal symptoms (Semple, et al 2013). Substance related disorders are divided into substance use and substance induced disorder focusing primarily on ten drug classes: hallucinogens, inhalants, alcohol, opioids, sedatives, caffeine, hypnotics, cannabis and anxiolytics, stimulants (cocaine and amphetamine-like drugs, tobacco and other substances or unknown). (APA, 2013).

One of the most important psychoactive substances globally, used when one is stressed is alcohol. A major public health concern globally is the use of alcohol, with respect to its impact on youth mortality and illness. Globally 6.2 litres of pure alcohol was consumed per person aged 15 years and above, consumed 6.2 litres (13.5gm) of alcohol per day

worldwide in 2010 (W.H.O 2014). Globally, deaths attributable to alcohol consumption in 2012 was 3.3 million or 5.9% (W.H.O 2014). Unfortunately, high consumption of alcohol has been associated to an increasing level of stress in one's life. Thus perceived stress can lead to use of alcohol and drugs. The study aims at determining the level of perceived stress and if it is associated with use of psychoactive substances among the students of University of Nairobi.

1.1.2 Background Information

Stress is defined as an individual's physical and emotional response to demands (positive and negative) made upon a person. University students encounter stress from different areas like studies, social, and personal challenges making stress a leading cause of mental illness (Waghachavare and Dhumale et al, 2013). Stress can contribute to emotional exhaustion resulting in anxiety and chronic stress can lead to depression (Sadock and Sadock et al, 2015). Unfortunately, unhealthy behaviour in the form of experimenting with alcohol and other psychoactive drugs may develop as a means of coping with these psychological changes and severe distress in life. At the University of Louisville, in Kentucky U.S.A, increased stress was reported that stress can lead to use of cigarettes and alcohol consumption (Von & Ngamvitroj, 2004). Prevalence of life time alcohol and drug use in colleges in India was reported to be 31.3%. Male students (37.5%) used alcohol and drugs more than female students (19.6%). The tobacco was used more than other drugs like, solvents, alcohol sedatives, cannabis, and amphetamine. (Baba et al, 2013).

In Haramay University in Ethiopia, 62.4% of the students had used at least one substance in their lifetime. Khat was use at least once in lifetime by 41.0% and the current use of khat was 23.6% of the students. Concerning alcohol drinking habits, 50.2% reported that they used alcohol at least once in their lifetime while 20% drunk alcohol over the last 30 days prior to the study. About a fifth, 22% of the respondents smoked at least once in their life time whereas 10.8% had smoked cigarettes in the past 30 days (Tesfaye et al, 2014).

The prevalence of life time use and current use of alcohol use among university students in Kenya is higher than the national prevalence. A national survey on alcohol and drugs abuse conducted in Kenya in 2012 reported that 30% of Kenyans aged between15-65 years have ever consumed alcohol in their lives and 13.3% of them were currently using alcohol (NACADA, 2012). Among students in a Kenyan university, female students reported higher stress levels than males, while negative coping strategies such as taking alcohol and drug use was reported by male students (Misigo, 2015). Among university students in Eldoret, prevalence of lifetime alcohol use was 51.9% (Atwoli et al, 2011). Prevalence of alcohol use among university of Nairobi students was 63.2% (Hassan, 2013). Despite growing concern about stress and alcohol and drug abuse amongst university students no research has been done to determine the association between perceived stress and alcohol and drug abuse amongst the students of the University of Nairobi. This study is designed to bridge this gap by determining the prevalence of perceived stress and its association with alcohol and drug use disorder.

1.2 Problem Statement

University students experience several circumstances that predispose them to stress. These include heavy academic workload, expectations on academic performance, limited finances, strained relationships, break up of romantic relationships and limited campus facilities. The students also have newly found freedom, to make choices on activities to engage in. These activities include, indulging in alcohol and drug consumption. Previous studies have indicated that use of alcohol and drugs is common among students and increasingly spreading in many African countries (Maknjuola et al, 2007). Students from the University of Nairobi get finances from Higher Education Loans Board, while others get additional money from their parents and guardians, which they can use for purchasing alcohol and drugs. Several bars and shops selling alcohol are located within walking distance to all university campuses. Illicit drugs are also sold within and outside the university campuses. Several cases of injured students, assaulted by fellow students who are under the influence of alcohol and drug are treated at the University of Nairobi health services. A study done at the University of Nairobi reported cases of intimate partner violence and that alcohol and drug abuse was one of the major causes (Njagi,2012).

The prevalence of perceived stress among the university of Nairobi students is unknown, and its association with alcohol and drug abuse and perceived stress is unknown. Studies report that majority of university students indulge in alcohol and drug abuse, some of whom could be doing so because of stress, anxiety and depression and other mental illnesses. Alcoholic drinks are easily available to the university students at the various campuses, from the bars within the city centre and the surrounding community. A study

by (Atwoli et al, 2011), on prevalence of substance abuse among university students in Eldoret, reported that, 69.8% of the students had use alcohol and drugs during their life. Lifetime use of alcohol use was 51.9%, and alcohol had been consumed by 97.6% of lifetime user in the week prior to the study. Current rate of cigarette use was 42.8%, with males students having statistically significantly higher rates than female students ($p < 0.05$). Cannabis use was 2% and cocaine 0.6%. Binge drinking two or more times in a period of two weeks is linked to a significantly lower academic grades (Pascarella et.al, 2007). Study by Singleton also reported that, the amount of alcohol consumed correlates significantly with grades (Singleton, 2007).

At Egerton University, the prevalence of current use of alcohol among students was 21.1 % and the study also reported significant association of alcohol use with the year of study, marital status, family's economic status and place of residence (Boitt, 2016).The negative consequences that have been linked to excessive stress among students, are violent behaviour, depression, suicide, various illnesses poor academic performance and early droop out from university education (Di Megilo, 2012). Both stress and alcohol and drug consumption are linked to negative consequences in the life of university students.

This study aims to establish if there is an association between, perceived stress, alcohol and drug use and sexual behavioural risk. Determining the association of perceived stress with alcohol and drug use behaviour will guide policy on alcohol and drug use education prevention programmes in the university.

1.3 Goals and Objectives

1.3.1 Main Objective was

The main objective was to investigate the association between perceived stress and alcohol and drug use disorder.

1.3.2 Specific Objective

1) Determine the Perceived stress levels among the university students.

2) Determine prevalence and types of substances used by undergraduate students of the University of Nairobi.

3) To establish the socio-demographic correlates of perceived stress and substance use among the students of the University of Nairobi.

4) Determine association between perceived stress levels and substance use among the undergraduate university of Nairobi students.

1.4 Research Questions

1) Is there an association between perceived stress and alcohol and drug use disorder among University of Nairobi students?

1.5 Hypothesis

A) Null hypothesis: There is no correlation between perceived stress levels and substance use disorder among the undergraduate students of University of Nairobi

B) Alternate hypothesis: There is correlation between perceived stress levels and substance use disorder.

1.6 Rationale/Justification

Stress and anxiety affect university students, socially, academically, and mentally. Most of the recent studies have concentrated on factors causing stress among the university students. A study done among university students in universities based in western Kenya, reported high levels of stress among the students (Misigo, 2015). There is currently no study on the association between and perceived stress and substance use disorder among university students in Kenya.

The National Authority for Campaign against drug Abuse (NACADA) requires that the universities provide education on prevention of consumption of alcohol and drug, to its employees and student community. The University of Nairobi currently runs a program on education for prevention of alcohol and drug use for it staff and students. The results of the study will inform the students, academic staff and university administration of the magnitude of stress, among university students and its association with alcohol and drug use. Stress can be prevented by introduction of stress management program for students at the University of Nairobi, which is currently lacking. The study will also provide base line data for monitoring association of stress, and alcohol and drug use which can be used for monitoring the impact of alcohol and drug use education and prevention programs conducted by various universities. University of Nairobi currently has no stress management program for its students. The study is expected to provide data to justify the introduction of stress management programs for the students. It will also provide baseline data for monitoring stress management programs in the universities.

Policy options and interventions for community action have been suggested by the Global strategy to reduce harmful use of alcohol, one of which involves carrying out rapid assessment to identify gaps and priority areas for intervention in the community and it recommends that the health sector should begin the task of informing the community about harmful use of alcohol and its public health and social consequences {W.H.O, 2010).This study will also help university of Nairobi counsellors provide appropriate counselling services to students affected by stress and alcohol and drug use disorder. Knowledge gained from the study will empower the students and stimulate them to seek stress reduction interventions. The study will serve as a source of reference material to students and other researchers who may undertake similar research work.

1.7 Conceptual Framework

Stress can lead to anxiety and depression. Stress, anxiety and depression can all lead to alcohol and drugs consumption and risky sexual behaviour. Alcohol consumption can also lead to risky sexual behaviour.

Figure1. Conceptual Framework

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┌─────────────────────────────────┐
│ SOCIO- DEMOGRAPHIC VARIABLES     │
│                                  │          ┌──────────────────┐
│ (MITIGATING FACTORS)             │          │ STRESS           │
│                                  │          │                  │
└─────────────────────────────────┘          │                  │
         ┌──────────────────────┐            │                  │
         │ ALCOHOL AND DRUG ABUSE│◄─────────►│                  │
         │                       │            └──────────────────┘
         │                       │
         └──────────────────────┘
              ┌────────────────────────────┐
              │ ANXIETY AND DEPRESSION      │
              │                             │
              │ (CONFOUNDERS)               │
              │                             │
              └────────────────────────────┘
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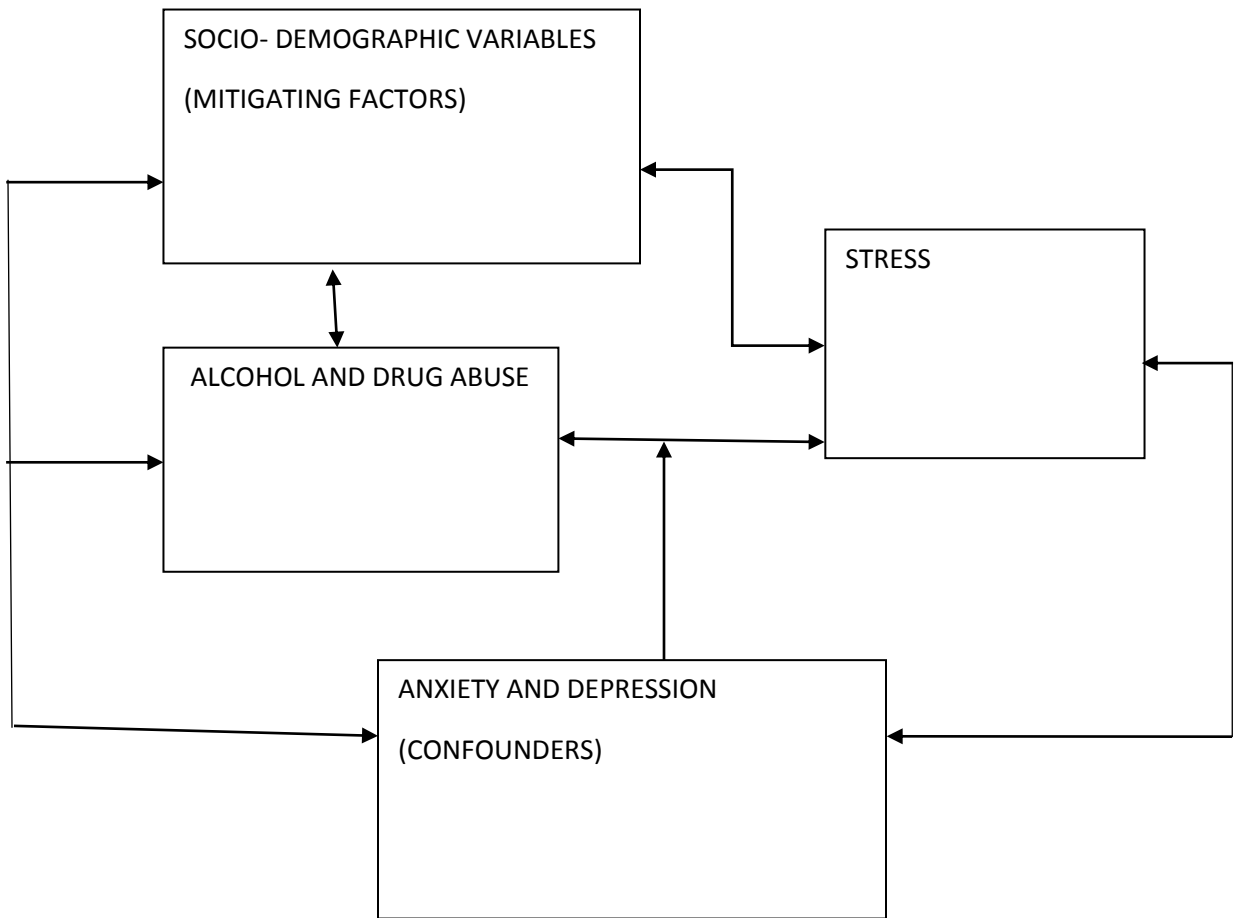
1.8 Study limitations

The study was a cross sectional study. It is therefore not possible to draw conclusion on

cause effect, that is does stress lead to substance use or does substance use lead to stress?

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Health issues both physical and mental, decline in studies and professional achievement, can result from too much stress (Yusoff, Rahim and Yacob 2010).

2.2 Stress among university students.2

Perceived stress Has been linked to risk of alcohol abuse, among French university students (Tavolaci, 2013). Among Chilean and Argentinean dental undergraduates, leading stressors were reported to be too much work, limited time and some areas of clinical training (Fonseca et al, 2013). In India more than 85% of dental students', reported, none co-operative patients, struggling in managing difficult cases, excessive course work and finishing clinical requirements to be "stressful" (Harikiran, 2012). In Jizan University in Saudi Arabia, lack of recreation, long hours of studying, examinations, very tight program, family issues, mental and emotional issues, and the education system itself were the major factors associated with stress (Sani et al, 2012). Intrapersonal, interpersonal, academic and environmental stressors have also been reported to affect students (Bulo et al, 2014). Attaining high academic credentials stresses students and leads to pressure to impress their parents, academic colleagues and other important people in their lives. (Lucier, 2012). Studies done among students of a Turkish university, reported that 27.1% were depressed, 47% had anxiety and s27% were tressed (Bayram et al, 2008). Another study done in a Turkey university reported that, being enrolled to a college and contentment with living were of value in stress. (Civitci, 2015).

Among medical students in Malaysian university the prevalence of the depression was 30.7%, anxiety 55.5% and stress 16.6%, and stress was significantly associated with ethnicity and total family income per month. (Teh, 2015). A study on perceived stress among university students in Ethiopia, reported a high perceived stress level among the students and a significantly higher level among female students, it added that that perceived stress level among fourth year students was significantly lower than that of first year students and that, the high stress levels was attributed to personal finances, social support from relatives and friends, relationship with academic colleagues, health issues and substance abuse (Madebo & Yosef et al, 2016).

In university of Botswana, too much class work, little resources, low incentives, low grades, overcrowding in lecture theatres, and unemployment after graduating from were causes of stress among students (Agolla et al, 2009). In University of Gondar in Ethiopia, perceived stress was reported in 40.9% of the students, with female gender, mental illness in the family, lifetime Khat consumption, lower academic achievement than expected, lack of holiday, and low support from relatives and friends, were some of the factors reported to be significantly linked to perceived stress (Dachew et al, 2015).

A study done in 12 schools around the world, on alcohol use and perceived stress in adolescents, reported that prevalence of previous 30 days consumption of alcohol and ever used of alcohol differed by a large margin in different countries, and that adolescents had higher risk of psychological distress by consuming alcohol in all the countries studied with only Myanmar excluded. Previous 30 days' alcohol use was linked to

emotional distressin nine of the study countries and elven countries reported increased risk of perceived stress among those who had ever abused alcohol in their lifetime (Boloqun, 2016).

Among students in a Kenyan University, female students reported higher stress levels than male students. Positive stress coping skills such as seeking Female students sought help from counsellors and friends more frequently than male students, thus displaying better positive coping skills for stress. was higher among female students. while negative coping strategies Use of alcohol and drugs, which are negative skills were reported more by male students (Misigo, 2015).

2.3 Perceived stress anxiety and depression

Positive association has been reported between perceived stress, anxiety and depression (Eisenberth et al 2013). Chronic stress exposure can lead to long term or permanent changes in emotional, physiological and behavioural response (Cohen et al, 2007). Anxiety can be defined as a physiological and psychological condition presenting with bodily, mental and character signs and symptoms. It is normally a consequence of stressful conditions and can contribute to someone bearing life challenges, however excessive stress can lead to disorders of worry and nervousness. (National Institute of Mental Health, 2008). University students worldwide are reported to have a significantly higher prevalence of stress levels than the general population (Stallman, 2010).

2.4 Global alcohol and drug use.

Global trend estimated numbers of drug users worldwide increased from 211million in 2007 to 255 million in 2015, while those with drug use disorders increased from 28million in 2007 to 29.5 million in 2015 (UNODC, 2017). Percentage of population using various drugs globally in 2013 was Cannabis 2.7%, Opioids 0.6%, Opiates 0.3%, Cocaine 0.3%, Amphetamines 0.2% (UONDC, 2015). In Midwestern State University in America, drinking alcohol to cope with depression is a significant and highly problematic factor in college students (Parker et al, 2015). Among Romanian University students use of drugs among female students rose from 2.5% in 1999 to 7.5% in 2003 and to 15% in 2011, and male students reported an increase from 14.2%, in 1999 to 18.1% in 2003 and to 30.6% in 2015. The female Consumption of illegal drugs by women has been strongly linked to difficulty in coping with stressful conditions and depression. associated with stress management problems and depressive episodes, while consumption of drugs by male students is associated with low grades. (Loltrim et al, 2016). In America, use of marijuana more than ten days in the previous 30 days was reported by about 1 in 12 undergraduate students. Anxiety and depression was associated with frequent marijuana use, while marijuana use was not associated perceived stress (Keith, 2015).

In Bolivia, Colombia, Ecuador, and Peru, leading illegal drug consumed in 2009 and 2012 among university students was marijuana. Previous month prevalence in 2009 was, 5.27% in Colombia, 1.0% in Peru, 1.68% in Ecuador and 0.76% in Bolivia, while in 2012, it was 7.4%, in Colombia, 3.6%, in Ecuador, 1.62% in Peru and 1.45% in Bolivia (Hynes et al, 2015).

2.5 Substance abuse region perspective.

At the University of Venda in south African, prevalence of alcohol use was reported at 65% of the students were using alcohol and 49% abuse it (Kwabena et al, 2013). In Addis Ababa University Ethiopia in the previous one year, 22% (25% male and 14% female) of the students used alcohol, while 7% used khat. Lifetime use of cigarettes was reported in 9% of the study participants, while current smokers were 1.8% (Deressa, 2011).

2.6 Substance use in Kenya

The leading substance of abuse in Kenya is alcohol, while bhang is the most easily available illicit drug in Kenya followed by cocaine (Ndetei et al., 2006). A study done by NACADA in Kenya in 2012 reported 30% of Kenyans aged 15-65 have ever used alcohol. Those who ever used khat declined from 11.3% in 2007 to 8.9% in 2012, while those who ever used bhang declined from 6.5% in 2007 to 5.4% in 2012(NACAD, 2012). Kenyans who had ever used bhang declined from 6.5% in 2007 to 5.4 in 2012 (NACAD, 2012). In Kenya in 2015, life time alcohol use was 10.8%, while those who were currently using alcohol were 9.2% (Jenkins, 2015).

Substance use prevalence increases after Kenyan students' transition from secondary schools to the university. A study done in Kenya rural secondary schools reported that the substance most commonly used were alcohol leading with prevalence rate of 5.2%, followed by tobacco at 3.8%, then khat (Catha edulis) at 3.2% and in fourth place is bhang (cannabis) at 1.7%, Consumption of tobacco started at the age of 10 years, and that of cannabis was initiated at 11 years, hard drugs (Ndetei et al, 2010). 36% of students

in Kenyan high schools were reported to be currently abusing alcohol, 42% of these are female students, while a study done in technical institutions in Kenya reported that commonly abused drugs were alcohol 47.34%, tobacco (18.84%), and bhang and khat 4.83% (NACADA, 2016).

Among students in Kenyan universities, 69.8% of the students had ever used alcohol and drugs in their lifetime, and 51.9% had used alcohol in their lifetime (Atwoli et al, 2011). 42.8%, of the students were current users of cigarettes while 2% were using cannabis and 0.6% using cocaine. 62.2% used substance to relax, while 60.8% used substance to relieve stress (Atwoli et al, 2011). In Bamburi location of Mombasa County, 50% of the youths were reported to be consuming alcohol and drugs and the drugs most used commonly were, cigarette leading followed by alcohol, miraa and bhang.

It was also reported that, they used substances to alleviate stressful feelings and to appreciate the feelings of their strength leading to rise in substance use (Bosco et al, 2012). A study done in Nairobi and Mombasa reported that most respondents started using between 5 to 28 years with the average starting age of 21years (18%), Friends and workmates introduced over 81% of respondents to substance. The leading drug of abuse were Kuber, followed by shisha, shashaman, mau, tambuu, jet fuel, kuku manga, mkorogo and, mshomoro, rohypnol, and artane (Gathu et al, 2013).A study at the University of Nairobi reported that causes of alcohol use among students were, peer influence, parenting, University environment and access to financial resources (Kimeli, Boyo, Khasakhala & Munene 2014).

2.7 Use of Khat by University students.

A study done in Jazan region of Saudi Arabia reported that 23.1% (males 38.5% and females 2.1%) of the higher education students were chewing khat and that 24.8% (40.5% males and 3.7% females) had chewed miraa in their lifetime. Gender, use of cigarettes and having companions using miraa and cigarettes were the students' characteristics contributing to use of miraa (Alsanosy and Mahfouz, 2013). A study done in northwest Ethiopia on khat use, reported that, 42% of the college students had used khat in their lifetime and 32.5% were current users (Teni and Surur 2015). A survey conducted at Kenyatta University reported that, 68.02% of participants were not drug consumers, while 25.5% were drugs consumers, 6.92% did not respond. Alcohol was used by 92.1% of those using substance, this was followed by, 62.9% consuming marijuana 51.5% tobacco products, 51.9% miraa (Catha edulis) and 5.9% cocaine (Tumuti and Wangeri et al 2014).

CHAPTER THREE

METHODOLOGY

3.1 Research design

This was a cross sectional study.

3.2 Study area

Study was carried out at the University of Nairobi. University of Nairobi has its main campus located in the central business district of Nairobi County. It has six Colleges located in various parts of Nairobi (See Map in appendix). The university currently has 84,000 students.

3.3 Study population

The study population was undergraduate students of the University of Nairobi.

3.4 Study participants

Participants were undergraduate students both male and female aged above 18 years. from six colleges. Students from year one to year four participated in the study.

3.5 Inclusion criteria:

Undergraduate students 18 years and older were included in the study.

3.6 Exclusion criteria:

Post graduate students and undergraduate students aged less than 18 years. Those who refused to give consent of participation in the study were excluded.

3.7 Sample Size Calculation

Population proportion sample size formula (Select Statistics, 2017)

n = N x X/X+N-1

Where $X = Z_{\alpha/2}^2$ x p x (1-p)/MOE^2

$X= 1.96^2$ x 0.5 x0.5/5^2 =0.038416

n = 84,000 x 038416 /0.038416 -1 = 383

n is sample size = 383

KEY:

$Z_{\alpha/2}$ is the critical value

MOE is margin of error = 5%,

Confidence level 95%,

 Population 84,000.

Sample proportion 50%,

3.8 Sampling method.

Multi stage, proportionate to size stratified and simple random sampling was used to select participants. Each of the six colleges formed first strata. Each college was allocated students in proportion to the college population. Within each college each of the four years formed the second strata. Each college has a register of students in the College

Dean's office. One of the faculties in the college was selected randomly as participants in the study. Students in the randomly chosen faculty were selected randomly to participate in the study. The randomly selected students were traced with the assistance of College Registrar. Permission was sought from Deans offices of various colleges before using the necessary registers.

3.9 Variables

Perceived stress, alcohol and drug use, socio demographic data of age, sex, year of study, place of residence i.e. on campus or out of campus. Confounding factors were anxiety and depression. Mitigating variables were Socio demographic data of age, sex, year of study,

3.10: Study Instruments:

A structured questionnaire was used to collect biological and socio demographic data. Data on perceived stress was collected using Cohen Perceived Stress Scale (Revised 1985). Data on alcohol and drug use was collected using World Health Organisation ASSIST questionnaire version 3.1.

3.11 Stress Measurement.

3.11.1 Cohen's Perceived Stress Scale:

Sheldon Cohen and his collaborators created Perceived Stress Scale (PSS), to compute the extent to which individuals perceived stress in life (Cohen 1983). The scale is a self – report measure of stress. The 10-item version of PSS was used in this study. The other

versions not used in this study are 4 and 14 items versions. The items are scored from 0 (*never*) to 4 (*very frequent*). Items 4, 5, 7 and 8 scores are reversed. Higher scores correspond to higher perceived stress (linear relation). It is not a diagnostic tool, so there are no cut off scores to determine stressed individuals. Comparisons were done between study participants.

3.12 The ASSIST Questionnaire version 3.1

The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) questionnaire was is a World Health Organization (WHO) tool, used in primary health care settings. It is an 8 item questionnaire administered by health workers to clients. The tool takes about 5-10 minutes to administer. The ASSIST tool is culturally neutral and useable across a variety of cultures to screen for use of various substances.

ASSIST questionnaire can be read to participants or paraphrased by the investigator, after the investigator has given the response card to the respondent. The investigator then explains, the list of substances and common terms used, the questions cover the last 3 months and lifetime, and are about non-prescribed use only. Confidentiality issues are also explained by the investigator to the respondent. At the start of the interview, the investigator clarifies the substances are to be covered during the interview and refers to them by names which are familiar to the respondent. List of the substance categories covered by the ASSIST and names associated with each category are contained in the response card. The card also has frequency responses for each question.

Each question on the ASSIST has a set of responses to choose from, and each response from questions 2 to 7 has a numerical score. The interviewer circles the numerical score that corresponds to the client's response for each question. At the end of the interview the scores from questions 2 through to 7 are added together across each individual substance (tobacco, alcohol, cannabis, cocaine, amphetamine-type stimulants, inhalants, sedatives/sleeping pills, hallucinogens, opioids and 'other' drugs) to produce an ASSIST risk score for each substance. In technical reports and papers this score is referred to as the specific substance Involvement score for each drug class. The ASSIST questionnaire was administered through an interview. Brief intervention or referral was given when necessary. Participants were assured of confidentiality.

3.12.1 Scoring of the ASSIST questionnaire

Question on the ASSIST have choices for respondents to select the appropriate answer. Question 2 to 7 have numerical scores for the answers. The investigator circles the numerical score that corresponds to the respondent's choice. After the interview the scores from question 2 to 7 were calculated for every substance to get an ASSIST risk score for each substance. The respondents were shown the ASSIST feedback report card with the scores. This was part of feedback to the respondent and also used to administer brief intervention when necessary.

3.12.2 Interpretation of ASSIST scores

The ASSIST is used to calculate a risk score for substance used by respondents and to initiate talk on brief intervention required by the respondents. Score obtained for each

substance are classified as: lower, moderate or high risk, and these determines the most appropriate intervention. In low risk no treatment is provided. In moderate risk brief intervention is provided. Referral to specialist for assessment and treatment is done for high risk.

3.13 Recruitment and data collection procedures

Authority to carry out the research provided by the Kenyatta National Hospital and University of Nairobi Ethics Committee. After randomly selecting the faculty in a college the students register in the faculty was used as the sampling frame. The randomly selected students were traced through the college registrar. The male to female ratio for the selected sample was proportional to sex ratio in the registers. Primary data was collected through questionnaire and interviews. If the student met study criteria, informed consent was obtained from the student. Those who failed to give consent were thanked and excluded from the study. Those who agreed to participate were then given the questionnaire starting with socio demographic data questionnaire, followed by PSS and then ASSIST questionnaires, administered through interview. A room for data collection was made available by the college principles.

3.13.1 Data management and statistical analysis plans.

The raw data was cleaned, coded, key-punched into a computer and given to a statistician to analyse.

Both descriptive and inferential statistics were used. Statistical significance was set at 95% CI and for all statistical tests $p \leq 0.05$ was considered significant and 95%

confidence intervals were used. Data were analysed using Statistical Package for the Social Sciences (SPSS) version 21.

Statistics used:

Descriptive statistics: Frequencies, Means, Standard Deviation and range

Bivariate analysis

- Independent samples t-test (Continuous and categorical variable with 2 categories)

  adjusting for degrees of freedom when equality of variances test is violated.

- Analysis of Variance (ANOVA) employing least significance differences (LSD) for pair-wise comparisons. (Continuous and categorical variable with more than 2 categories)

- Chi-Square test (For categorical variables)

Multivariate analysis was also used.

3.14 Quality Assurance procedures

Questionnaire pretesting was done. Ten students were randomly selected in one of the faculties in the university and questionnaires given to them. Any deficiencies noted in the questionnaire were corrected.

The researcher ensured that questionnaires were filled by the participants for sociodemographic data and Cohen's questionnaire for perceived stress scores. He then conducted interview using the ASSIST questionnaire.

The purpose of the study was explained to the participants before starting the data collection and interview. The lack of material benefit for participants was communicated. Participants were informed of options to opt out of the study any time they wanted.

The informed consent form contained the title, area of study, names and contacts of the investigator, supervisors, KNH ethics and research committee.

3.15 Ethical consideration:

Confidentiality was maintained at all times. The identity of other participants was not revealed to any respondent. Written informed consent was sought from all research participants before including them in the study. This followed a full and detailed explanation of the study.

I explained to the participants, that taking part in the study was voluntary and information collected during the study would only be used for the purpose of the study.

I also explained to the Study participants that there would be no material gain from the study. Study participants were assured of confidentiality and that no participant's names would appear on any document. There were no risks to the participants. However, questions on alcohol and drug use may evoke psychological invasiveness. No participant had psychological distress as a result of the questions. No invasive procedure was used.

CHAPTER FOUR: RESULTS

4.1 Overview:

Data analysis consisted of data preparation, cleaning, preliminary analyses, a description of the composition of the sample, and testing of the main hypotheses. All statistical tests done with an alpha level of $p < 0.05$. Data was analyzed using Statistical package for social sciences (SPSS) version 21.

4.2 Socio demographic characteristics of respondents.

371 (96.61%) respondents participated out of 384 randomly selected students from six colleges. Thirteen students who had been randomly selected declined to participate as they were busy preparing for tests or end of semester examinations. The male students were 209 (56.3%) and female students 162(43.7%), with sex ratio of male to female of 1.3:1. Majority of the students resided in the university hostels 241 (64.9%), and those in non-university hostels 42 (11.3%) while those that stay at home 88 accounted for 23.7% of the participants. Module 1 student were 319 (86%), while modules 2 were 52 (14%). On religious affiliation Protestants were 218 (58.7%), Catholics 98 (26.4%), Muslims 44 (11.9%) and no religion 11 (3%). (Table 1)

Table 1: Socio-demographic Characteristics of the Respondents

Variable Percentage	Category	Frequency (N=371)	%
Gender	Female	162	43.7
	Male	209	56.3
Marital Status	Married	43	11.6
	Single	328	88.4
Module	Module 1	319	86.0
	Module 2	52	14.0
Residence	Non University Hostel	42	11.3
	University Hostel	241	64.9
	Staying at home	88	23.8
Religion	Catholic	98	26.4
	Protestant	218	58.7
	Muslim	44	11.9
	None	11	3.0
College	Agriculture and Veterinary medicine	59	15.9
	Biological and physical sciences	61	16.4
	Health sciences	63	17.0
	Architecture and engineering	63	17.0
	Education and external studies	62	16.7
	Humanities and social sciences	63	17.0
Year of Study	First Year	91	24.5
	Second Year	94	25.3
	Third Year	94	25.3
	Fourth Year	92	24.8

4.3 Prevalence of Perceived Stress

Overall the mean perceived stress score was 16.7 (S.D 3.8) range 10 to 24. The prevalence of perceived stress of more than 20 was 13.7% (95% C.I 10.2-17.5). More

than half 50.4% (95% C.I. 45.6-55.3) had stress levels ranging from 16-20 while 35.8% (95% C.I. 31.3-40.7) had stress level of 10-15. Figure 1.

Figure 1 Perceived stress score distribution

Perceived Stress Scores Distribution Plot (N=371)
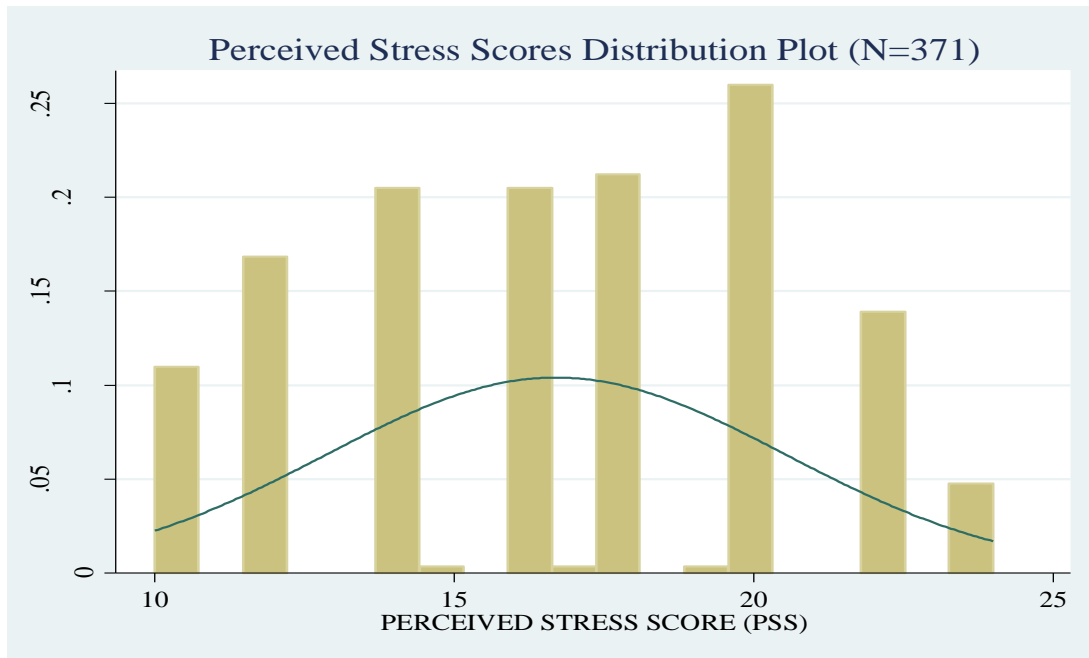
4.4. Prevalence and types of substances used by undergraduate students.

190 (51.2%) of participants were currently using alcohol, followed by tobacco 40 (10.78%), cannabis 39 (10.78), Miraa 16(4.3%) codeine 7 (1.88%) respectively. Those using multiple drugs were 63(16%). No participant used inhalants and hallucinogens. (Table 2).

Table 2. Prevalence and types of substances used by undergraduate students of the University of Nairobi

Alcohol and Drug use	N = 371	Percentage %
Alcohol	190	51'2
Tobacco	40	10.78
Cannabis	39	10.51
Miraa	16	4.31
Kuber	3	0.80
Sedative	1	0.26
Codeine	7	1.88
Amphetamine	6	1.61
Cocaine	1	0.26
Multiple drugs use.	63	16.0

4.5. Prevalence of specific drug use by severity.

Among those currently using alcohol 21(26.6%) had low risk, 20(25.3%) moderate risk and 38(48.1%) high risk scores. Those using tobacco had 1(2.5%) low risk, 20(50%) moderate risk and 19(47.5%) high risk scores. Those who had high risk scores were referred to the university health services for counselling and rehabilitation. Those with moderate risk were referred to the college counsellors for counselling. (Table 3)

Table 3 Prevalence of specific Drug use by severity.

Category of Drugs and Substances	`Risk Levels			Total
	Low Risk	Moderate Risk	High Risk	
	n(%)	n(%)	n(%)	N(%)
1. Alcohol	49(25.8%)	48(25.3%)	93(48.1%)	190(100.0%)
2. Tobacco	1(2.5%)	20(50.0%)	19(47.5%)	40(100.0%)
3. Cannabis	3(7.7%)	16(41.0%)	20(51.3%)	39(100.0%)
4. Miraa	0(0.0%)	14(87.5%)	2 (12.5%)	16(100.0%)
5. Kuber	0(0.0%)	1(33.3%)	2(66.7%)	3(100.0%)
6. Sedatives	0(0.0%)	0(0.0%)	1(100.0%)	1(100.0%)
7. Codeine	2(28.6%)	4(57.1%)	1(14.3%)	7(100.0%)
8. Amphetamine	0(0.0%)	4(66.7%)	2(33.3%)	6(100.0%)
9. Cocaine	0(0.0%)	0(0.0%)	1(100.0%)	1(100.0%)
10. Multiple drugs use	3(9.1%)	17(51.5%)	13(39.4%)	33(100.0%)

Key: Multiple drug use includes various combinations of alcohol, tobacco, cannabis, miraa, Kuber, sedatives, codeine and amphetamine. The maximum number of psychoactive substances used per individual were three.

4.5. Association between perceived stress score and sociodemographic characteristics

Females had mean perceived stress level of 17.9 (S.D 3.6) which is significantly higher than the mean score for males of 15.7 (S.D 3.8), $p<0.0001$. Those staying at home had significantly higher perceived stress score 17.7 (SD 3.7), than those staying in non-university hostels 16.3 (S.D 3.9) and those staying in university hostels 16.4 (S.D 3.8) $p= 0.0181$. The first year students had a significantly higher perceived stress score than those in year two, three and four $p= 0.0181$. The mean perceived stress scores for student in the College of education and external studies were significantly less than the mean scores for

those in the other five colleges p= 0.0012. The were no significant differences for

perceived stress scores in regards to marital status, module of study and religion

affiliation. (Table 4)

Table 4: Association between perceived stress score and sociodemographic

characteristics.

Variable	Category	N	Mean(SD) (PSS scores)	Group Differences
Gender	Female	162	17.9±3.6	$t_{(369)}=5.68$;
	Male	209	15.7±3.8	***P<0.0001***
Marital Status	Married	43	17.7±3.7	$t_{(356)}=1.77$;
	Single	315	16.6±3.8	*P=0.0770*
Module	Module 1	319	16.8±3.8	$t_{(369)}=1.54$;
	Module 2	52	15.9±3.7	*P=0.1254*
Residence	Stays at Home	88	17.7±3.7	$F_{(2,368)}=4.0$;
	Non University Residence	42	16.3±3.9	**P=0.0185**
	University Residence	239	16.4±3.8	
Religion	Catholic	98	16.7±3.8	$F_{(3, 364)}=0.46$;
	Protestant	212	16.7±3.8	*P=0.7123*
	Muslim	44	16.2±4.2	
	None	11	17.6±4.4	
College	Agriculture and Veterinary medicine	59	17.2±3.5	$F_{(5, 370)}=4.11$;
	Biological and physical sciences	61	16.1±3.6	**P=0.0012**
	health sciences	63	17.7±4.0	
	Architecture and engineering	63	17.3±4.2	
	Education and external studies	62	15.0±3.9	
	Humanities and social sciences	63	16.9±3.3	
Year of Study	First	91	17.8±3.5	$F_{(3, 370)}=3.4$;
	Second	94	16.5±3.9	**P=0.0181**
	Third	94	16.2±3.8	
	Fourth	92	16.3±3.9	

4.7 Correlation between perceived stress scores and alcohol and drug use scores.

There was also positive correlation between alcohol consumption and perceived stress

score with, Pearson's coefficient of 0.550. The mean perceived stress score for those

currently using tobacco is 20.2 (S.D 8.8). There was significant association between perceived stress and tobacco use p= 0.0010. There was no significant association between perceived stress and current use of cannabis, Miraa, Kuber, sedatives, codeine, and amphetamines, cocaine and multiple drugs use. (Table 5).

Table 5. Association between Perceived Stress mean score and specific drug scores

Alcohol and Drug use Scores	N	Mean ±SD	PSS scores	
			Pearson's Correlation (r)	P-value
Alcohol scores	190	19.6±10.4	**0.550**	**<0.0001**
Tobacco Scores	40	20.2±8.8	**0.501**	**0.0010**
Cannabis Scores	39	19.6±10.4	0.139	0.7019
Miraa Scores	16	13.5±7.4	-0.290	0.5768
Kuber Scores	3	23.3±8.1	0.918	0.2601
Sedative scores	1	32.0	UD	UD
Codeine scores	7	11.4±10.1	0.098	0.8346
Amphetamine Scores	6	20.0±7.3	0.568	0.2394
Cocaine scores	1	28.0	UD	UD
Multiple drugs use Scores	33	17.9±9.8	0.179	0.3189

Note: UD-Undetermined.

4.8. Bivariate Association between perceived stress levels and alcohol and drug use.

There was a statistically significant association between drug use and perceived stress. Respondents who were taking drugs had significantly higher levels of perceived stress as compared to those who do not take (P<0.001).

The mean perceived stress score for those currently taking alcohol was 17.8 (S. D= 2.9) vs. 16.4 (SD=4.0) for those who don't take. The same pattern was repeated in those who take tobacco and other drugs. There was a significant difference between risk of drug use and perceived stress (P<0.001). Participants who were taking alcohol and substances at

high risk levels had significantly higher levels of perceived stress as compared to those who take at moderate, low and those who don't take at all p< 0.001. No significant differences in perceived stress was found between those who do not take, those with low risk and those with moderate risk in terms of the perceived stress scores. (Table 6).

Table 6: **Association between perceived stress and current use of drugs**

Drug/Substance	Use/Risk	N	Mean(SD)	Group Differences
Alcohol	No	292	16.4±4.0	$t_{(167.2)}$=-3.6; **P=0.0005**
	Yes	190	17.8±2.9	
Tobacco	No	331	16.6±3.9	$t_{(58.3)}$=-2.5; **P=0.0145**
	Yes	40	17.8±2.9	
Other Drugs*	No	338	16.6±3.9	$t_{(47.1)}$=-2.9; **P=0.0057**
	Yes	63	18.0±2.6	
Risk Levels	No Risk	181	16.1±4.1	$F(3,370)$=17.7;
	Low Risk	49	15.5±3.1	**P<0.0001**
	Moderate Risk	48	16.2±2.6	
	High Risk	93	19.8±2.3	

Note: *Cannabis; Mirraa; Kuber; Sedatives; Codeine; Amphetamine and Cocaine.

4.9 Correlation between perceived stress scores and alcohol and drug use scores.

There was also positive correlation between alcohol consumption and perceived stress score with, Pearson's coefficient of 0.550. The mean perceived stress score for those currently using tobacco is 20.2 (S.D 8.8). There was significant association between perceived stress and tobacco use p= 0.0010. There was no significant association between

perceived stress and current use of cannabis, Miraa, Kuber, sedatives, codeine, and amphetamines, cocaine and multiple drugs use. (Table 7).

Table 7. Association between Perceived Stress mean score and specific drug scores

Alcohol and Drug use Scores	N	Mean ±SD	PSS scores	
			Pearson's Correlation (r)	P-value
Alcohol scores	190	19.6±10.4	**0.550**	**<0.0001**
Tobacco Scores	40	20.2±8.8	**0.501**	**0.0010**
Cannabis Scores	39	19.6±10.4	0.139	0.7019
Mirraa Scores	16	13.5±7.4	-0.290	0.5768
Kuber Scores	3	23.3±8.1	0.918	0.2601
Sedative scores	1	32.0±	UD	UD
Codeine scores	7	11.4±10.1	0.098	0.8346
Amphetamine Scores	6	20.0±7.3	0.568	0.2394
Cocaine scores	1	28.0±	UD	UD
Other drugs Scores*	33	17.9±9.8	0.179	0.3189

Note: *Cannabis; Miraa; Kuber; Sedatives; Codeine; Amphetamine and Cocaine; UD-Undetermined

4.10 Multivariate analysis of factors independently associated with perceived stress score

After adjusting for the factors that were associated with perceived stress at the bivariate level (P<0.2). Gender was significantly associated with perceived stress, with females more likely to report high levels of perceived stress (β=2.33, 95% (C.I 1.59 to 3.04;

P<0.001), for every unit increase of perceived stress in males perceived stress in females increase by about 2.3 times.

Being in college of humanities and external studies is protective against experiencing perceived stress (β=-1.58, 95% (C.I -2.82 to -0.34; P=0.0123) as compared to those in the school of humanities and social sciences, however no significant differences were found between college of humanities and social sciences and other colleges (P>0.05). Table 8 Use of alcohol was significantly associated with perceived stress. Those who were not taking alcohol were likely to report significantly less perceived stress as compared to those who were taking (β=-1.19, 95% (C.I -2.08 to -0.31; P=0.0083).

Use of other drugs (Cannabis; Miraa; Kuber; Sedatives; Codeine; Amphetamine or Cocaine) was significantly associated with perceived stress with those who were not using likely to report significantly less perceived stress as compared to those who were not taking (β=-1.79, 95% (C.I -3.05 to -0.52; P=0.0056). No significant differences were found between age, marital status, education module, residence, year of study and current use of tobacco. Table 8

Table 8: Multivariate analysis of factors associated with perceived stress

Variable	Category	Mean†	β(s .e)	95%C.I β	P-Value
Gender	Female	19.4	2.32(0.4)	1.59 to 3.04	**<0.0001**
	Male	17.0	Ref.		
Marital Status	Married	18.7	0.93(0.6)	-0.16 to 2.03	0.0939
	Single	17.7	Ref.		
Module	Module 1	18.7	1.01(0.6)	-0.11 to 2.12	0.0764
	Module 2	17.7	Ref.		
Residence	Stays at Home	18.7	0.80(0.5)	-0.17 to 1.76	0.1046
	Non University Residence	18.0	0.11(0.6)	-1.15 to 1.37	0.8638
	University Residence	17.9	Ref.		
School	Agriculture and Veterinary medicine	18.3	-0.07(0.6)	-1.30 to 1.17	0.9161
	Biological and physical sciences	17.5	-0.93(0.6)	-2.15 to 0.29	0.1346
	Health sciences	19.1	0.67(0.7)	-0.61 to 1.96	0.3057
	Architecture and engineering	19.1	0.69(0.7)	-0.61 to 1.98	0.2995
	Education and external studies	16.8	-1.58(0.6)	-2.82 to -0.34	**0.0123**
	Humanities and social sciences	18.4	Ref.		
Year of Study	First Year	18.9	0.77(1.2)	-1.62 to 3.16	0.5273
	Second Year	17.9	-0.20(1.1)	-2.34 to 1.95	0.8584
	Third Year	17.8	-0.29(0.9)	-2.05 to 1.47	0.7443
	Fourth Year	18.1	Ref.		
Current Alcohol Use	No	17.6	-1.19(0.5)	-2.08 to -0.31	**0.0083**
	Yes	18.8	Ref.		
Current Tobacco Use\	No	17.9	-0.50(0.6)	-1.67 to 0.66	0.3957
	Yes	18.4	Ref.		
Current Other* Drugs Use	No	17.3	-1.79(0.6)	-3.05 to -0.52	**0.0056**
	Yes	19.1	Ref.		

Note: β- Beta coefficient is then the average difference in PSS scores between the category for the reference group and the category for which the comparison group, C.I-Confidence interval, s.e.-Standard error, †-Estimated marginal means, * Cannabis; Mirraa; Kuber; Sedatives; Codeine; Amphetamine and Cocaine.

CHAPTER FIVE

5.1 Summary of Findings

A total of 371 (96.61%) respondents participated from six colleges. The male students were 209 (56.3%) and female students 162(43.7%). Overall the mean perceived stress score was 16.7 (S.D 3.8) range 10 to 24. 230 (62%) participants were currently using alcohol and drugs. The most commonly used psychoactive substance was alcohol 190 (51.21%) followed by tobacco 40 (10.78%), cannabis 39 (10.78), miraa 16 (4.3) and codeine 7 (1.88%). Those using multiple drugs were 33(8.9%). No participant used inhalants and hallucinogens. Females had mean perceived stress level 0f 17.9 (S.D 3.6) which is significantly higher than the mean score for males of 15.7 (S.D 3.8), p<0.0001.

Those staying at home had significantly higher perceived stress score 17.7 (SD 3.7) than those staying in non-university hostels 16.3 (S.D 3.9) and those staying in university hostels 16.4 (S.D 3.8) p= 0.0181. The first year students had a significantly higher perceived stress score than those in year two, three and four p= 0.018. The mean perceived stress scores for student in the College of education and external studies were significantly less than the mean scores for those in the other five colleges p= 0.0012. There were no significant differences for perceived stress scores in regards to marital status, module of study and religion affiliation.

The mean perceived stress score for those currently taking alcohol was 19.6 (S>D 10.4), Alcohol use and perceived stress score had a significant association, p <0.0001.

The mean perceived stress score for those currently using tobacco is 20.2 (S.D 8.8). Tobacco consumption and perceived stress score had a significant association p= 0.0010. Current use of cannabis, Miraa, Kuber, sedatives, codeine, and amphetamines, cocaine and multiple drugs use had no association with perceived stress score. Among those currently using alcohol 49(25.8%) had low risk, 48(25.3%) moderate risk and 93(48.1%) high risk scores. Those using tobacco had 1(2.5%) low risk, 20(50%) moderate risk and 19(47.5%) high risk scores. Those with high risk were referred for counselling and rehabilitation.

5.2 Discussion

Mean perceived stress levels were significantly higher in female students than male students. This is similar to a study done among university students in Moi University in Eldoret which reported, that perceived stress was significantly higher in female students than male students (Misigo, 2015). However, a study done among college students in India found no significant difference in gender perceived stress score (Anbumalar and Dorathy et al, 2017). Another study done in California state University in United states reported female students significantly more stressed than male students (Calvarese, 2015). No statistically significant differences in perceived stress levels in, marital status, place of residence, module of study, and religion was derived.

Current use of alcohol was 51.2%. This is higher than 21.7% reported by a study done Egerton University (Boitt, et al 2016). It is higher than 13.3 reported in a national survey on current use of alcohol conducted in Kenya in 2012 (NACADA, 2012). A study done

in Debre University in Ethiopia reported current use of 17% (Gebramal, 2018). However, a study done at Venda University in South Africa reported that 70% of the students were currently consuming alcohol (Kyei and Ramagoma, 2013) and colleges in Brazil reported current use of 60.5% (Andrea et al, 2012). Current use of tobacco was 10%. This is almost similar to the report of a study done in Himachal Pradesh in India, among dental students, of current use of 9% (Shailee and Girish et al, 2013). It is lower than 11.2%, reported by a survey conducted in Doula, Cameroon college students (Betrand and Mbatchou et al, 2015). A study done in Debre University in Ethiopia reported current use of tobacco as 3.1% (Gebramal, 2018). A study done in Brazilian colleges reported current use of tobacco to be 21.6% (Andrea et al, 2012).

Module of study, year of study and place of residence, were not significantly associated with high perceived stress score and alcohol and drugs consumption. A study done in Egerton University in Kenya reported that here was lack of statistical association between use of alcohol, program of study undertaken and place of residence. (Boit,2016). Perceived stress was significantly lower in in the College of education and external studies compared with the other colleges (P=0.0128).

Those who were currently using alcohol (p=0.006); Tobacco (P=0.0073) and multiple drugs (P=0.0050) reported significantly greater perceived stress as than those who were not using the said drugs. A study done among university students in France reported significant relationship between abuse of alcohol and perceived stress, but no relationship with regular consumption (Tavolaci and Ladner et al 2013). A study done in colleges in

the united states reported that, perceived stress and negative affect positively related to smoking cigarette, (Magid et al, 2009). 76(46.91%) females and 114(54.54%) males consumed alcohol in the previous 3 months.

A study done in United States of America reported that, women had greater levels of stress and greater association between stress and alcohol consumption to cope than men (Kenneth and Amy et al, 2010). Tobacco use and alcohol consumption was significantly linked to perceived stress. Those who were not taking alcohol were likely to report significantly less perceived stress as compared to those who were taking. Use of other drugs (Cannabis; Miraa; Kuber; Sedatives; Codeine; Amphetamine or Cocaine) was not significantly associated with perceived stress.

Among those currently using alcohol 49(25.8%) had low risk, 48(25.3%) moderate risk and 93(48.1%) high risk scores. A study done in university of Nairobi using AUDIT scores reported that the of the respondents with lifetime alcohol use 124(44%) were categorized in zone 1, with low risk of consumption, 124(44%) were in zone 2, representing moderate risk and 25(8.6%) in zone 3 with high risk or hazardous problem. Zone 4 had 9 respondents (3.2%), representing alcohol use disorder (Hassan, 2010).The low and moderate risk levels are different from those reported from a study done in Daystar university which reported low risk at 15%, moderate 39%, but high risk is almost equal to 45% reported in that study (Ndegwa et al, 2017).

5.3 Conclusion

1) Perceived stress is significantly associated with alcohol and tobacco use among the students of the University of Nairobi.

5.4 Recommendation

1) There is a need to scale up the education on prevention of alcohol and drug use. The University management needs to provide adequate funds to those running the program to ensure more frequent education is provided to the students and a larger number of students are reachedThe University needs to introduce a stress management program in all its colleges. Currently there is none.

2) There is a need of conducting a study to establish other factors contributing to stress among the students of the university of Nairobi apart from socio-demographic factors.

3) There is a need of intensifying sensitization of the students' community on availability of counselling and rehabilitation services in the university.

4) Students attending treatment should be screened for alcohol and drug use.

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APPENDICES

APPENDIX I: BUDGET

No	CORE ACTIVITY	ITEM/PARTICULARS	COST KSH
1	Consolidation of literature	Library search	
		Travelling expenses 30 days @ Ksh 500.	15,000
		Lunch expenses 30days @ 300	9,000
2	Design and development of research instrument	Typing and photocopying research instrument.	8,000
3	Pretesting of research instrument	Transport expenses 2 days @ 500 Ksh.	1,000
		Lunch expenses 2 days @ 300	600
4	Data collection	Transport expenses 60 days @ 1000 ksh	60,000
		Lunch expenses 60 days @300 Ksh	18,000
5	Data processing and analysis	One statistician	30,000

6	Report writing	Typing and photocopying and binding	10,000
7	Sub Total		151,600
8	10% Contingencies		15,160
	TOTAL		166,760

I financed the research from my salary.

APPENDIX II: WORK PLAN

TIME	EVENT OR ACTIVITY
JULY – MAY 2017	Proposal development
MAY 2017	PRESENTING PROPOSAL
JUNE TO SEPTEMBER 2017	SEEK UON/KNH ERC APPROVAL
SEPTEMBER TO OCTOBER 2017	DO CORRECTION AS ADVICED BY THE UON/KNH ERC
NOVEMBER 2017	SEEK UON/KNH ERC APPROVAL OF CORRECTED VERSION OF THE PROPOSAL
DECEMBER 2017 TO JANUARY 2018	DATA COLLECTION
FEBRUARY AND MARCH 2018	DATE ANALYSIS AND THESIS WRITING
APRIL 2018	PRESENTATION OF RESEARCH RESULTS

APPENDIX IIl: Explanations on research subjects before signing consent form

Informed consent explanation to be read and questions answered in a language in which the subject is fluent. (English)

My names are Dr Gordon Ambayo, a post graduate student in Psychiatry department in the University of Nairobi. As part of my Training, I am required to do a research project. My study aims is to find out the association between perceived stress and alcohol and drug abuse and behavioural risk among undergraduate students of the University of Nairobi. This study will be carried out under the supervision of Dr Sobie Mulindi, Dr. Muthoni Mathai and Dr. Lincoln Khasakhala, who are lecturers in the department of Psychiatry, University of Nairobi.

This is a Medical research study and you are required to understand the following general principles, which apply to all in medical research:

Your agreement is entirely Voluntary, You may withdraw from the study at any time.

Refusal to participate will not lead to any penalty or benefit to which you are otherwise entitled.

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

The procedure will involve me asking you questions concerning your perception your stress status, your use of alcohol, bhang and khat. Some questions I will ask may be personal and may elicit emotional or psychological discomfort; you are free not to respond in case you feel uncomfortable. These will be in form of Questionnaires. No invasive procedure such as drawing of blood will be involved.

All information obtained from this study will remain confidential and your privacy will be upheld. Identification will be by number only, no names will be used in this study or in its future publications.

I hope that information generated by this study will be of benefit, leading to the implementation of better interventions and comprehensive care for students of the university of Nairobi.

In case you have any questions pertaining to your role and rights as a research participant you are free and encouraged to seek clarification/ guidance from the ethics committee through the following contact.

Prof A.N Guantei Tel 2727300 ext 44355 KNH Nairobi

APPENDIX IV: ASSOCIATION OF PERCEIVED STRESS, SUBSTANCE USE DISORDERS, AND BEHAVIOURAL RISK AMONG STUDENTS AT THE UNIVERSITY OF NAIROBI

CONSENT FORM: RESEARCH PARTICIPANT STATEMENT

I. the undersigned having been fully explained and understood the purpose, risks and benefits of the above study do hereby Voluntarily to participate in this study. The nature and purpose have been fully explained by Dr Gordon Ambayo.

I, understand that all information gathered will be used for the purposes of this study only and my confidentiality will be upheld throughout.

Signature _____   Date _____

Investigators statement

I confirm that I have fully explained to the above all the details pertaining to my study and I have given an opportunity to ask questions and all the questions have been satisfactory answered.

I will abide by the statements and spirit of this consent.

Signature _____Date _____

Dr. Gordon Ambayo

APPENDIX V: ASSOCIATION OF PERCEIVED STRESS, SUBSTANCE USE DISORDERS, AND BEHAVIOURAL RISK AMONG STUDENTS AT THE UNIVERSITY OF NAIROBI

SOCIO-DEMOGRAPHIC QUESTIONNAIRE

Date _____   Serial number _____

I Age in years _____ (Fill in the blank)

For the following questions tick the correct one.

2. Sex   Male _____   Female _____

3. Marital status: i. Single _____   ii Married _____ iii. separated _____

 iv. Divorced _____   v. Widowed_____   v. Cohabiting _____

4. Current academic year of study i Year one _____ ii Year two _____

iii Year three _____   iv Year four _____ v Year five _____

 vi Year Six _____

5. Study Module(Tick)

i Module one _____ ii Module two _____ Module three

Others specify _____

6. Place of residence (Tick)

i At university hostels _____ ii Non University hostels iii _____   iv In the Estates with parents _____

v In the Estates with guardian _____   vi Others specify _____

7. Religion:i. Catholics _____ii. Protestants _____iii. Muslims _____

iv. Seventh Day Adventists _____   v. Others specify _____

APPENDIX VI: COHEN PERCEIVED STRESS SCALE

The following questions ask about your feelings and thoughts during THE PAST MONTH. In each question, you will be asked HOW OFTEN you felt or thought a certain way. Although some of the questions are similar, there are small differences between them and you should treat each one as a separate question. The best approach is to answer fairly quickly. That is, don t try to count up the exact number of times you felt a particular way, but tell me the answer that in general seems the best.

For each statement, please tell me if you have had these thoughts or feelings: never, almost never, sometimes, fairly often, or very often. (Read all answer choices each time)

	Never	Almost never	Sometimes	Fairly often	Very often
B.1. In the past month, how often have you been upset because of something that happened unexpectedly?	0	1	2	3	4
B.2. In the past month, how often have you felt unable to control the important things in your life?	0	1	2	3	4
B.3. In the past month, how often have you felt nervous or stressed?	0	1	2	3	4
B.4. In the past month, how often	0	1	2	3	4

have you felt confident about your ability to handle personal problems?					
B.5. In the past month, how often have you felt that things were going your way?	0	1	2	3	4
B.6. In the past month, how often have you found that you could not cope with all the things you had to do?	0	1	2	3	4
B.7. In the past month, how often have you been able to control irritations in your life?	0	1	2	3	4
B.8. In the past month, how often have you felt that you were on top of things?	0	1	2	3	4
B.9. In the past month, how often have you been angry because of things that happened that were outside of your control?	0	1	2	3	4
B.10. In the past month, how often have you felt that difficulties were piling up so high that you could not overcome them?	0	1	2	3	4

Perceived Stress Scale Scoring

Each item is rated on a 5-point scale ranging from never (0) to almost always (4). Positively worded items are reverse scored, and the ratings are summed, with higher scores indicating more perceived stress.

PSS-10 scores are obtained by reversing the scores on the four positive items: For example, 0=4, 1=3, 2=2, etc. and then summing across all 10 items. Items 4, 5, 7, and 8 are the positively stated items.

Your Perceived Stress Level was _____

Scores around 13 are considered average. In our own research, we have found that high stress groups usually have a stress score of around 20 points. Scores of 20 or higher are considered high stress, and if you are in this range, you might consider learning new stress reduction techniques as well as increasing your exercise to at least three times a week. High psychological stress is associated with high blood pressure, higher BMI, larger waist to hip ratio, shorter telomere length, higher cortisol levels, suppressed immune function, decreased sleep, and increased alcohol consumption. These are all important risk factors for cardiovascular disease.

APPENDIX VII

The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST Version 3.1)

Introduction (To be read to the client)

The following questions ask about your experience of using alcohol, tobacco products and other drugs across your lifetime and in the past three months. These substances can be smoked, swallowed, snorted, inhaled or injected (show response card). Some of the substances listed may be prescribed by a doctor (like amphetamines, sedatives, pain medications). For this interview, we will not record medications that are used as prescribed by your doctor. However, if you have taken such medications for reasons other than prescription, or taken them more frequently or at higher doses than prescribed, please let me know. While we are also interested in knowing about your use of various illicit drugs, please be assured that information on such use will be treated as strictly confidential.

Client ID [   ]   Date [   ]

Before asking questions, give ASSIST response card to client		
QUESTION 1 In your life, which of the following substances have you ever used (non-medical use only)?		
A Tobacco product (cigarettes, chewing tobacco, cigars, etc.)	NO	YES
B Alcoholic beverages (beer, wine, spirits, etc.	NO	YES
C Cannabis (marijuana, pot, grass, hash, etc.)	NO	YES
D Cocaine (coke, crack, etc.	NO	YES
E Amphetamine-type stimulants (speed, meth, ecstasy, etc.)	NO	YES
F Inhalants (nitrous, glue, petrol, paint thinner, etc.	NO	YES
G Hallucinogens (LSD, acid, mushrooms, trips, ketamine, etc.)	NO	YES
H Sedatives or sleeping pills (diazepam, alprazolam, flunitrazepam, midazolam, etc.)	NO	YES
I Opioids (heroin, morphine, methadone, buprenorphine,	NO	YES

codeine, etc.) Hallucinogens (LSD, acid, mushrooms, trips, ketamine, etc.)		
J Other – specify:	NO	YES
Probe if all answers are negative: "Not even when you were in school?"	If "No" to all items, stop interview. If "Yes" to any of these items, ask Q2 for each substance ever used	

Question 2 In the past three months, how often have you used the substances you mentioned (first drug, second drug, etc)?	Never	Once or Twice	Monthly	Weekly	Daily or almost daily
A Tobacco products (cigarettes, chewing tobacco, cigars, etc.	0	2	3	4	6
B Alcoholic beverages (beer, wine, spirits, etc.)	0	2	3	4	6
C Cannabis (marijuana, pot, grass, hash, etc.)	0	2	3	4	6
D Cocaine (coke, crack, etc.	0	2	3	4	6
E Amphetamine-type stimulants (speed, meth, ecstasy, etc.)	0	2	3	4	6
F Inhalants (nitrous, glue, petrol, paint thinner, etc.)	0	2	3	4	6
GSedatives or sleeping pills	0	2	3	4	6

(diazepam, alprazolam, flunitrazepam, midazolam, etc.)					
H Hallucinogens (LSD, acid, mushrooms, trips, ketamine, etc.	0	2	3	4	6
I Opioids (heroin, morphine, methadone, buprenorphine, codeine, etc.)	0	2	3	4	6
J Other – specify:	0	2	3	4	6
If "Never" to all items in Q2, skip to Q6. If any substances in Q2 were used in the previous three months, continue with Questions 3, 4 & 5 for each substance used.					

Question 3 During the past three months, how often have you had a strong desire or urge to use (first drug, second drug, etc)?	**Never**	**Once or twice**	**Monthly**	**Weekly**	**Daily or almost daily**
A Tobacco products (cigarettes, chewing tobacco, cigars, etc.	0	3	4	5	6
B Alcoholic beverages (beer, wine, spirits, etc.	0	3	4	5	6
C Cannabis (marijuana, pot, grass, hash, etc.)	0	3	4	5	6
D Cocaine (coke, crack, etc.)	0	3	4	5	6
E Amphetamine-type stimulants (speed, meth, ecstasy, etc.)	0	3	4	5	6

	Never	Once or twice	Monthly	Weekly	Daily or almost daily
F Inhalants (nitrous, glue, petrol, paint thinner, etc.)	0	3	4	5	6
G Sedatives or sleeping pills (diazepam, alprazolam, flunitrazepam, midazolam, etc.)	0	3	4	5	6
H Hallucinogens (LSD, acid, mushrooms, trips, ketamine, etc.)	0	3	4	5	6
I Opioids (heroin, morphine, methadone, buprenorphine, codeine, etc.)	0	3	4	5	6
J Other – specify:	0	3	4	5	6

Question 4 During the past three months, how often has your use of (first drug, second drug, etc) led to health, social, legal or financial problems?	**Never**	**Once or twice**	**Monthly**	**Weekly**	**Daily or almost daily**
A Tobacco products (cigarettes, chewing tobacco, cigars, etc.)	0	4	5	6	7
B Alcoholic beverages (beer, wine, spirits, etc.)	0	4	5	6	7
C Cannabis (marijuana, pot, grass, hash, etc.)	0	4	5	6	7

	NEVER	ONCE OR TWICE	MONTHLY	WEEKLY	DAILY OR ALMOST DAILY
D Cocaine (coke, crack, etc.)	0	4	5	6	7
E Amphetamine-type stimulants (speed, meth, ecstasy, etc.)	0	4	5	6	7
F Inhalants (nitrous, glue, petrol, paint thinner, etc.)	0	4	5	6	7
G Sedatives or sleeping pills (diazepam, alprazolam, flunitrazepam, midazolam, etc.)	0	4	5	6	7
H Hallucinogens (LSD, acid, mushrooms, trips, ketamine, etc.	0	4	5	6	7
I Opioids (heroin, morphine, methadone, buprenorphine, codeine, etc.)	0	4	5	6	7
J Other – specify:	0	4	5	6	7
Question 5 During the past three months, how often have you failed to do what was normally expected of you because of your use of (first drug, second drug, etc)?	**NEVER**	**ONCE OR TWICE**	**MONTHLY**	**WEEKLY**	**DAILY OR ALMOST DAILY**
A Tobacco products	0	5	6	7	8
B Alcoholic beverages (beer, wine, spirits, etc.)	0	5	6	7	8

C Cannabis (marijuana, pot, grass, hash, etc.)	0	5	6	7	8
D Cocaine (coke, crack, etc.)	0	5	6	7	8
E Amphetamine-type stimulants (speed, meth, ecstasy, etc.)	0	5	6	7	8
F Inhalants (nitrous, glue, petrol, paint thinner, etc.)	0	5	6	7	8
G Sedatives or sleeping pills (diazepam, alprazolam, flunitrazepam, midazolam, etc.)	0	5	6	7	8
H Hallucinogens (LSD, acid, mushrooms, trips, ketamine, etc.)	0	5	6	7	8
I Opioids (heroin, morphine, methadone, buprenorphine, codeine, etc.	0	5	6	7	8
J Other – specify:	0	4	5	6	7
Ask questions 6 & 7 for all substances ever used (i.e. those endorsed in Q1).					

QUESTION 6 Has a friend or relative or anyone else ever expressed concern about your use of (first drug, second drug, etc)?	NO NEVER	YES IN THE PAST 3 MONTHS	YES BUT NOT IN THE PAST 3 MONTHS
A Tobacco products (cigarettes, chewing tobacco, cigars, etc.)	0	6	3
B Alcoholic beverages (beer, wine, spirits, etc.)	0	6	3
C Cannabis (marijuana, pot, grass, hash, etc.)	0	6	3
D Cocaine (coke, crack, etc.)	0	6	3
EAmphetamine-type stimulants (speed, meth, ecstasy, etc.)	0	6	3
F Inhalants (nitrous, glue, petrol, paint thinner, etc.)	0	6	3
G Sedatives or sleeping pills (diazepam, alprazolam, flunitrazepam, midazolam, etc.)	0	6	3
H Hallucinogens (LSD, acid, mushrooms, trips, ketamine, etc.)	0	6	3
I Opioids (heroin, morphine, methadone, buprenorphine, codeine, etc.)	0	6	3
J Other – specify:	0	6	3
Ask questions 6 & 7 for all substances ever used (i.e. those endorsed in Q1)			

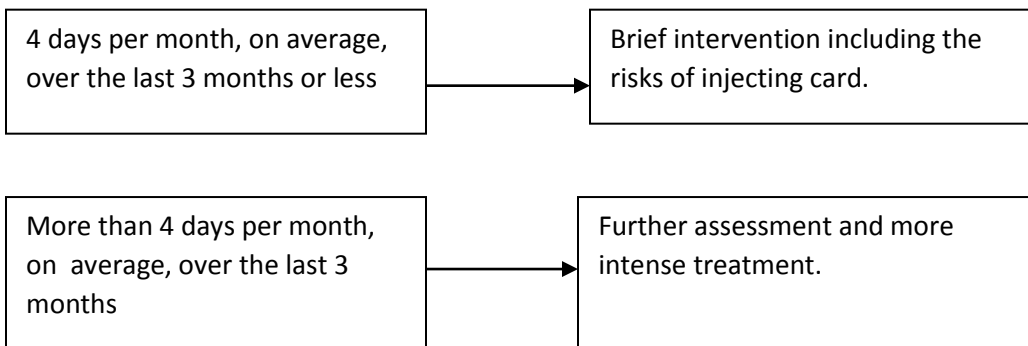| QUESTION 7 Have you ever tried to cut down on using (first drug, second drug, etc) but failed?	NO NEVER	YES IN THE PAST 3 MONTHS	YES BUT NOT IN THE PAST 3 MONTHS
A Tobacco products (cigarettes, chewing tobacco, cigars, etc.)	0	6	3
B Alcoholic beverages (beer, wine, spirits, etc.)	0	6	3
C Cannabis (marijuana, pot, grass, hash, etc.)	0	6	3
D Cocaine (coke, crack, etc.)	0	6	3
E Amphetamine-type stimulants (speed, meth, ecstasy, etc.)	0	6	3
F Inhalants (nitrous, glue, petrol, paint thinner, etc.)	0	6	3
G Sedatives or sleeping pills (diazepam, alprazolam, flunitrazepam, midazolam, etc.)	0	6	3
H Hallucinogens (LSD, acid, mushrooms, trips, ketamine, etc.)	0	6	3
I Opioids (heroin, morphine, methadone, buprenorphine, codeine, etc.)	0	6	3
J Other – specify:	0	6	3
Ask questions 6 & 7 for all substances ever used (i.e. those endorsed in Q1).			

QUESTION 8 Have you ever used any drug by injection (non-medical use only)?	NO NEVER	YES IN THE PAST 3 MONTHS	YES BUT NOT IN THE PAST 3 MONTHS
(Please tick the appropriate box)			
IMPORTANT NOTE			
Clients who have injected drugs in the last 3 months should be asked about their pattern of injecting during this period, to determine their risk levels and the best course of intervention.			

PATERN OF INJECTING   **INTERVENTION GUIDELINES**

4 days per month, on average, over the last 3 months or less	⟶	Brief intervention including the risks of injecting card.

More than 4 days per month, on average, over the last 3 months	⟶	Further assessment and more intense treatment.

How to calculate a specific substance involvement score

For each substance (labelled 'a' to 'j') add up the scores received for questions 2 through 7 inclusive. Do not include the results from either Q1 or Q8 in this score. For example, a score for cannabis would be calculated as: Q2c + Q3c + Q4c + Q5c + Q6c + Q7c.

Note that Q5 for tobacco is not coded, and is calculated as: Q2a + Q3a + Q4a + Q6a + Q7a.

The type of intervention is determined by the patient's specific substance involvement score				
	Record specific substance score	No Intervention	Received brief intervention	More intensive treatment
a)Tobacco		0-3	4-26	27+
b) alcohol		0-10	11-26	27+
c)Canabis		0-3	4-26	27+
d)Cocaine		0-3	4-26	27+
e)ATS		0-3	4-26	27+
f)Inhalants		0-3	4-26	27+
g)Sedatives		0-3	4-26	27+
h)Hallucinogens		0-3	4-26	27+
i)Opiods		0-3	4-26	27+
j)Other drugs		0-3	4-26	27+
Now use ASSIST feedback report card to give client brief intervention				

APPENDIX VIII: ASSIST v3.1 response card

RESPONSE CARD	Substances
A Tobacco products (cigarettes, chewing tobacco, cigars, etc.)
B Alcoholic beverages (beer, wine, spirits, etc.)
C Cannabis (marijuana, pot, grass, hash, etc.)
D Cocaine (coke, crack, etc.)
E Amphetamine-type stimulants (speed, meth, ecstasy, etc.)
F   Inhalants (nitrous, glue, petrol, paint thinner,etc)
G Sedatives or sleeping pills (diazepam, alprazolam, flunitrazepam, midazolam, etc.)
H Hallucinogens (LSD, acid, mushrooms, trips, ketamine, etc.)
I Opioids (heroin, morphine, methadone, buprenorphine, codeine, etc.)
J Other – specify:

RESPONSE CARD	Frequency responses	
Response card Last 3 months (ASSIST questions 2 to 5)	Response card Lifetime (ASSIST questions 6 to 8)
I Never: not used in the last 3 months.	I No, never.
I Once or twice: 1 to 2 times in the last 3 months.	I Yes, but not in the past 3 months. I Yes, in the past 3 months.
I Monthly: average of 1 to 3 times per month over the last 3 months.	
I Weekly: 1 to 4 times per week.	
I Daily or almost daily: 5 to 7 days per week.	

APPENDIX IX: ASSIST v3.1 feedback report card

Client ID [   ]   Date [   ]

Specific substance involvement scores	Score	Risk Level
A Tobacco products		
B Alcoholic beverages		
C Cannabis		
D Cocaine		
E Amphetamine-type stimulants		
FInhalants		
G Sedatives or sleeping pills		
H Hallucinogens		
I Opioids		
J Other – specify:		

RESPONSE CARD	Frequency responses	
Response card Last 3 months (ASSIST questions 2 to 5) Never: not used in the last 3 months. Once or twice: 1 to 2 times in the last 3 months. Monthly: average of 1 to 3 times per month over the last 3 months. Weekly: 1 to 4 times per week. Daily or almost daily: 5 to 7 days per week.	Response card Lifetime (ASSIST questions 6 to 8) No, never. Yes, but not in the past 3 months. Yes, in the past 3 months.

APPENDIX X: ASSIST v3.1 feedback report card scores

Specific substance involvement scores	Score	Risk level	
A Tobacco products		0 – 3 4 – 26 27+	Lower Moderate High
B Alcoholic beverages		0 – 10 11 – 26 27+	Lower Moderate High
C Cannabis		0 – 3 4 – 26 27+	Lower Moderate High
D Cocaine		0 – 3 4 – 26 27+	Lower Moderate High
E Amphetamine like stimulants		0 – 3 4 – 26 27+	Lower Moderate High
F Inhalants		0 – 3 4 – 26 27+	Lower Moderate High
G Sedatives or sleeping pills		0 – 3 4 – 27+	Lower Moderate High
H Hallucinogens		0 – 3 4 – 26 27+	Lower Moderate High
I Opioids		0 – 3	Lower Moderate

		4 – 26	High
		27+	
J Others = Specify		0 – 3	Lower
		4 – 26	Moderate
			High
		27+	

What do your scores mean?
Lower: You are at lower risk of health and other problems from your current pattern of use.
Moderate: You are at moderate risk of health and other problems from your current pattern of substance use.
High: You are at high risk of experiencing severe problems (health, social, financial, legal, relationship) as a result of your current pattern of use and are likely to be dependent.

Are you concerned about your substance use?		
A TOBACCO		
Your risk of experiencing these harms is (tick one):		
Low ☐	Moderate ☐	High ☐
Regular tobacco smoking is associated with		
Premature ageing and wrinkling of the skin		
Low fitness and longer recovery times after having a cold or flu		
Respiratory infections and asthma		
High blood pressure and diabetes mellitus		
Miscarriage, premature labour and low birth weight babies for pregnant women.		
Kidney disease		

Chronic obstructive pulmonary diseases including emphysema
Heart disease, stroke and vascular diseases
Cancers of lung, bladder, breast, mouth, throat and oesophagus

A Alcohol		
Your risk of experiencing these harms is (tick one)		
Low ☐	Moderate ☐	High ☐
Hangovers, aggressive and violent behaviour, accidents and injury, nausea and vomiting		
Reduced sexual performance and premature ageing		
Digestive problems, ulcers, inflammation of the pancreas and high blood pressure		
Anxiety and depression, relationship difficulties, and financial and work problems		
Difficulty remembering things and solving problems		
Birth defects and brain damage in babies of pregnant women		
Permanent brain damage leading to memory loss, cognitive deficits and disorientation		
Stroke, muscle and nerve damage		
Liver and pancreas diseases		
Cancers of the mouth, throat and breast		
Suicide		

C Cannabis		
Your risk of experiencing these harms is (tick one)		
Low ☐	Moderate ☐	High ☐
Regular use of cannabis is associated with		
Problems with attention and motivation		

Anxiety, paranoia, panic and depression
Decreased memory and problem solving ability
High blood pressure
Asthma and bronchitis
Psychotic symptoms and psychoses particularly in those with a personal or family history of schizophrenia
Heart disease and chronic obstructive pulmonary disease
Cancers of the upper airway and throat

D Cocaine		
Your risk of experiencing these harms is (tick one)		
Low ☐	Moderate ☐	High ☐
Regular use of cocaine is associated with:		
Difficulty sleeping, heart racing, headaches and weight loss		
Numbness, tingling, clammy skin and skin scratching or picking		
Intense craving and stress from the lifestyle		
Accidents and injury and financial problems		
Mood swings – anxiety, depression and mania		
Paranoia, irrational thoughts and difficulty remembering things		
Aggressive and violent behaviour		
Psychosis after repeated use of high doses		
Sudden death from cardiovascular acute conditions		

E Amphetamine type stimulants
Your risk of experiencing these harms is (tick one):

Low	☐	Moderate	☐	High	☐

Regular use of amphetamine-type stimulants is associated with:
Difficulty sleeping, loss of appetite and weight loss, dehydration and reduced resistance to infection
Jaw clenching, headaches and muscle pain
Mood swings –anxiety, depression, agitation, mania and panic
Tremors, irregular heartbeat and shortness of breath
Difficulty concentrating and remembering things
Paranoia, aggressive and violent behaviour
Psychosis after repeated use of high doses
Permanent damage to brain cells
Liver damage, brain haemorrhage and sudden death from cardiovascular acute conditions

F Inhallants
Your risk of experiencing these harms is (tick one

Low	☐	Moderate	☐	High	☐

Regular use of inhalant is associated with
Flu like symptoms, sinusitis and nosebleeds
Nausea and vomiting, indigestion, stomach ulcers and diarrhoea
Dizziness and hallucinations, nausea, drowsiness, disorientation and blurred vision
Headaches, accidents and injury, unpredictable and dangerous behaviour
Coordination difficulties, slowed reactions and poor oxygen supply to the body

Memory loss, confusion, depression, aggression and extreme tiredness
Delirium, seizures, coma and organ damage (heart, lungs, liver, kidneys)
Death from heart failure

G Sedatives or sleeping pills					
Your risk of experiencing these harms is (tick one):					
Low	☐	Moderate	☐	High	☐
Regular use of sedatives is associated with:					
Drowsiness, dizziness and confusion					
Difficulty concentrating and remembering things					
Nausea, headaches and unsteady gait					
Sleeping problems					
Anxiety and depression					
Tolerance and dependence after a short period of use					
Severe withdrawal symptoms					
Overdose and death if used with alcohol, opioids or other depressant drugs					

H OPIOIDS					
Your risk of experiencing these harms is (tick one):					
Low	☐	Moderate	☐	High	☐
Regular use of opioids is associated with:					
Itching, nausea and vomiting					
Drowsiness, constipation, tooth decay and irregular menstrual periods					

Difficulty concentrating and remembering things
Depression, reduced libido and impotence
Financial difficulties and criminal offences
Relationship stress
Problems maintaining work and family life
Tolerance, dependence and withdrawal symptoms
Overdose and death from respiratory failure
H Hallucinogens
Your risk of experiencing these harms is (tick one)

Low	Moderate	High
☐	☐	☐

Regular use of hallucinogens is associated with:

APPENDIX XI: COLLEGES AND FACULTIES INVOLVED IN THE STUDY

COLLEGE	FACULTY
COLLEGE OF AGRICULTURE AND VETERINARY MEDICINE	AGRICULTURE
COLLEGE OF BIOLOGICAL AND PHYSICAL SCIENCE	PHYSICAL SCIENCE
COLLEGE OF ARCHITECTURE AND ENGINEERING	MECHANICAL AND MANUFACTURING ENGINEERING
COLLEGE OF EDUCATION AND EXTERNAL STUDIES	SCHOOL OF EDUCATION
COLLEGE OF HEALTH SCIENCES	MEDICINE
COLLEGE OF HUMANITIES AND SOCIAL SCIENCE	BUSINESS ADMINISTRATION FINANCE AND ACCOUNTING

APPENDIX XII: MAP OF NAIROBI