

**SUBSTANCE USE AMONG EMPLOYEES OF MOI  
TEACHING AND REFERRAL HOSPITAL, ELDORET,  
KENYA.**

**BY**

**TEMET CHEPKOECH EUNICE**

**A THESIS SUBMITTED IN PART-FULFILMENT FOR THE  
AWARD OF THE DEGREE OF MASTER OF MEDICINE IN  
PSYCHIATRY AT THE SCHOOL OF MEDICINE, COLLEGE OF  
HEALTH SCIENCES, MOI UNIVERSITY**

**© 2022**

**DECLARATION**

**Declaration by the Candidate**

I declare this thesis as my own original work of research and that it has not been submitted previously for the award of any other academic qualification.

Name: Dr. Temet Chepkoech Eunice

Registration Number: SM/PGPSY/05/16

Signature:.....Date:.....

**Approval by Supervisors**

This thesis has been submitted for examination with the approval of the under listed University supervisors.

1) Dr. Rogers Songole (PHD)

Senior Lecturer, Department of Mental Health and Behavioral Sciences, School of Medicine, Moi University.

Signature:.....Date:.....

2) Dr. Florence Jaguga, MBchB, MMed(Psych)

Consultant Psychiatrist, Department of Mental Health, Moi Teaching and Referral Hospital, Eldoret, Kenya.

Signature:.....Date:.....

## **ACKNOWLEDGEMENT**

I would like to express my deepest appreciation to the departments of Mental Health and Behavioral Sciences of Moi University and to the Directorate of Mental Health Services of Moi Teaching and Referral Hospital for the support given to me during the development of my study proposal and through to the completion of my thesis. I would also like to give special gratitude to my supervisors, Dr. Rogers Songole and Dr. Jaguga Florence, whose immense contribution helped me to complete my thesis. Dr. Asha Mwangi was quite instrumental in the development of my research topic, having been my consultant during the beginning of my psychiatric rotations. Her support and contributions are highly appreciated. I would like to also acknowledge with much appreciation the crucial role played by the Lecturers in the department of Mental Health in the School of Medicine, Moi University, which enabled me gain knowledge and skills that were of great importance during my thesis writing. Last but not least, I acknowledge my colleagues, Drs Aden, Korir, Kogo, Janbibi and Babu for their support, encouragement and input throughout my thesis writing period.

## **DEDICATION**

I dedicate this research work to the employees of Moi Teaching and Referral Hospital.

## LIST OF ABBREVIATIONS

The following abbreviations were used in the thesis report and mean as indicated.

<b>AOR</b>	Adjusted Odds ratio
<b>APA</b>	American psychiatric Association
<b>ASSIST</b>	Alcohol, Smoking and Substance Involvement Screening Test
<b>CEO</b>	Chief Executive Officer
<b>CME</b>	Continuous Medical Education trainings
<b>DALYs</b>	Disability-Adjusted Life Years
<b>DSM</b>	Diagnostic and Statistical Manual
<b>DSM IV</b>	Diagnostic and Statistical Manual fourth (4th) edition
<b>DSM IV –TR</b>	Diagnostic and Statistical Manual fourth (4th) edition Text Revision
<b>DSM V</b>	Diagnostic and Statistical Manual fifth (5th) edition
<b>EAPs</b>	Employee Assistance programs
<b>HCWs</b>	Healthcare workers
<b>HICs</b>	High Income Countries
<b>ICD-10</b>	International Classification of Diseases-10
<b>IREC</b>	Institutional Research and Ethics Review Committee
<b>LMIC</b>	Low and Middle Income Countries

<b>MDG</b>	Millennium Development Goals
<b>MTRH</b>	Moi Teaching and Referral Hospital
<b>NACADA</b>	National Authority for the Campaign against drug Abuse
<b>NACOSTI</b>	National Commission for Science, Technology and Innovation
<b>US</b>	United States (of America)
<b>WHO</b>	World Health Organization

## DEFINITION OF KEY TERMS

### ADDICTION

According to the National Institute on Drug Abuse (NIDA), addiction refers to the chronic, relapsing brain disease that is characterized by compulsive drug seeking **and use, despite harmful consequences**. It is the uncontrollable or overwhelming need to use a substance, and the compulsion is long-lasting and can return unexpectedly after a period of improvement (NIDA, 2021).

### DSM

The diagnostic and statistical manual is a guideline developed by the American Association of Psychiatrists that defines and classifies mental disorders in order to improve diagnoses, treatment, and research. The latest edition, the DSM V was published in 2013.

### SUBSTANCE

A substance is a psychoactive drug with the ability to affect mental processes, e.g. cognition or affect (WHO, 2017a). According to the Lexicon of alcohol and drug terms, the term ‘drug’ is often used to refer to a psychoactive drug, and even more specifically to illicit drugs, of which there is non-medical use in addition to any medical use. Although the term is used variedly, it pharmacologically refers to any chemical agent that alters the biochemical and physiological processes of tissues or organisms. Substances in common non-medical use such as caffeine, tobacco and alcohol are also referred to as drugs in the sense of being taken at least in part for their psychoactive effects (WHO, 2021).

Based on their pharmacology and behavioral effects, The DSM V classifies substances into ten separate classes as follows:

1. Alcohol

2. Caffeine
3. Cannabis
4. Hallucinogens( Phencyclidine or similarly acting arylcyclohexylaminesand other hallucinogens such as LSD)
5. Inhalants
6. Opioids
7. Sedatives
8. Hypnotics and anxiolytics
9. Stimulants (Including amphetamine type substances, cocaine and otherstimulants).
10. Tobacco (APA, 2013)

## **SUBSTANCE ABUSE AND SUBSTANCE DEPENDENCE**

**Substance abuse** according to the fourth edition of the DSM refers to a pattern of compulsive substance use marked by recurrent significant social, occupational, legal, or interpersonal adverse consequences, such as repeated absences from work or school, arrests, and marital difficulties.

**Substance dependence**, in DSM IV- TR, refers to a cluster of cognitive, behavioral, and physiological symptoms indicating continued use of a substance despite significant substance-related problems. There is a pattern of repeated substance ingestion resulting in tolerance, withdrawal symptoms if use is suspended, and an uncontrollable drive to continue use (APA Dictionary, 2021).

In DSM V, however, both terms have been subsumed into **substance use disorder** and are no longer considered distinct diagnoses (APA, 2013).

## **SUBSTANCE USE DISORDER**

Substance use disorder in the DSM V refers to a pattern of substance use characterized by cognitive, behavioral and physiological symptoms indicating that the individual continues using the substance despite significant substance-related problems (American Psychiatric Association [APA], 2013). The diagnosis of a substance use disorder is based on a pathological pattern of behaviors related to use of the substance where there is impaired control, social impairment, risky use, tolerance and withdrawal symptoms. The term refers to the continuum of symptoms found in persons using substances ranging from mild to severe combination of symptoms. The DSM V combines the DSM-IV categories of substance abuse and substance dependence into a single disorder. The two diagnostic categories were merged into a single disorder (substance use disorder) in the DSM-5 (APA, 2013).

## **TOLERANCE**

Tolerance is defined as a person's diminished response to a drug that is the result of repeated use. It is the physical effect of repeated use of a drug, and not necessarily a sign of addiction. Tolerance is one of the two prime indications of physical dependence on a drug, the other being a characteristic **withdrawal syndrome** (APA Dictionary, 2021; DSM V).

## **WITHDRAWAL**

Substance withdrawal refers to the physical signs and symptoms that occur upon the abrupt discontinuation or decrease in intake of substances. Usually, the syndrome develops after cessation of prolonged, heavy consumption of a substance. Symptoms vary by substance but generally include physiological, behavioral, and cognitive manifestations, such as nausea and vomiting, insomnia, mood alterations, and anxiety (APA, 2013).

## **OPERATIONALIZATION OF TERMS**

In this study, the following operational terms were used and their meanings were as indicated.

### **CO-WORKER'S SUBSTANCE USE**

This term is used in this study to refer to the use of substances by an employee who works with another employee especially one with a similar job or level of responsibility.

### **CURRENT PREVALENCE OF USE OF A SUBSTANCE**

It refers to the proportion of employees who have used a substance in the past three months prior to the survey.

### **HEALTHCARE WORKER**

Anyone who delivers care and services to the sick and ailing either directly or indirectly (Bobby et al., 2016).

### **HOSPITAL EMPLOYEES**

A hospital employee will refer to a healthcare worker, who delivers health or health support services within a hospital.

### **LIFETIME PREVALENCE OF USE OF A SUBSTANCE**

It refers to the proportion of employees who have ever used a substance in their lifetime.

### **NON-MEDICAL USE OF SUBSTANCES**

The term in general and in this study refers to the taking of a substance for a purpose not consistent with legal or medical guidelines, as in the non-medical use of prescription medications (WHO, 2017a).

## **RISK CATEGORIES OF SUBSTANCE USE**

Substance use will be categorized according to the ASSIST questionnaire, on an associated risk scale, as ‘lower risk’ (occasional or non-problematic use), ‘moderate risk’ (more regular use) and ‘high risk’ (frequent high-risk use) in this study. The risk categories are normally used to link clients to the various intervention programs and ‘High risk’ or dependent use according to WHO is often more easily identified by clinicians in comparison to low or moderate risk substance use (WHO, 2010).

## **SUBSTANCE AVAILABILITY**

Availability will refer to the degree to which a substance is present at a defined working area for the employees in that work area at the moment of need.

## **SUBSTANCE USE**

Substance use in the context of this study will refer to the non-medical consumption of any amount of a psychoactive drug, both licit and illicit, including the consumption of prescription drugs for non-medical use.

## ABSTRACT

**Background:** Substance use is an unhealthy behavior that predisposes healthcare workers to health, social and work-related problems. Few studies conducted in Low- and Middle-Income Countries have investigated the burden of substance use among healthcare workers, and particularly among hospital employees. Knowledge on the extent of the problem and its associated factors is important in establishing interventions especially in Low- and Middle-Income countries where human resource for health is scarce. This study therefore intends to bridge an existing gap in knowledge.

**Broad objective:** To determine the prevalence and factors associated with substance use among employees of Moi Teaching and Referral Hospital.

**Methods:** This was a cross-sectional study in which multistage stratified sampling technique was used to stratify the sampling frame into cadre, work station and sex, and proportionate random sampling technique was used to identify the respondents. The World Health Organization's Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) questionnaire was administered to 374 employees of Moi Teaching and Referral Hospital (MTRH), in Eldoret, Kenya, between January and June 2020. A total of 330 employees responded. Descriptive statistics were used to summarize the data, while inferential statistical methods were used to assess for associations.

**Results:** The mean age of the respondents was 37 years (SD +/-7.8). Majority were female (62.4%). 44.8% were in the age category of 30-39 years. The prevalence of lifetime use was 42.42% for alcohol, 7.88% for tobacco, 5.15% for cannabis, 3.94% for sedatives, 3.33% for Cocaine, 2.12% for hallucinogens, 1.82% for Opioids, 0.91% for Amphetamines, and 0.3% for inhalants. Alcohol (29.05%) and tobacco (6.73%) were the most commonly used substances in the past three months. Only two participants (0.61%) reported lifetime use of injection drugs. Majority of the respondents fell in the low and moderate risk categories of current substance users. Lifetime use of alcohol was significantly associated with being male ( $p<0.001$ ), Being unmarried ( $p=0.024$ ), Use of substances by co-workers ( $p<0.001$ ) and ease in availability of substances at the workplace ( $p=0.039$ ). Lifetime use of tobacco was significantly associated with being male ( $p<0.001$ ), years of work experience ( $p=0.004$ ) and use of substances by coworkers ( $p=0.042$ ).

**Conclusion:** The prevalence of lifetime and current use of substances among hospital employees was high especially for alcohol and tobacco. Being male and having a co- worker who was using substances were common predictors of substance use.

**Recommendations:** Based on the findings, we recommend regular screening of MTRH employees for alcohol, tobacco and other substance use. We further recommend that, interventions targeting groups at risk be implemented and strict surveillance be done to ensure that substances are not easily accessible within the workplace at MTRH.

## TABLE OF CONTENTS

DECLARATION .....	ii
ACKNOWLEDGEMENT .....	iii
DEDICATION .....	iv
LIST OF ABBREVIATIONS .....	v
DEFINITION OF KEY TERMS .....	vii
OPERATIONALIZATION OF TERMS .....	x
ABSTRACT .....	xii
TABLE OF CONTENTS .....	xiii
LIST OF TABLES .....	xv
LIST OF FIGURES .....	xvi
CHAPTER ONE .....	1
1.0 INTRODUCTION .....	1
1.1 Background to the Study .....	1
1.2 Statement of the Problem .....	13
1.3 Justification .....	16
1.4 Significance .....	22
1.5 Objectives .....	23
1.5.1 Broad Objective .....	23
1.5.2 Specific objectives of the Study .....	23
1.6 Research Questions .....	24
1.6.1 Main Research Question .....	24
1.6.2 Specific Research Questions .....	24
CHAPTER TWO .....	25
2.0 Literature Review .....	25
2.1 Introduction .....	25
2.2 Prevalence of Substance Use in the Society and At the Workplace .....	25
2.3 Prevalence of substance use among healthcare workers .....	27
2.4 Factors Associated with Substance Use among Healthcare workers .....	30
2.5 Conclusion .....	41
CHAPTER THREE .....	42
3.0 METHODOLOGY .....	42
3.1 Study Design .....	42
3.2 Conceptual Framework .....	43
3.3 Study area .....	44
3.4 Background of study area .....	44

3.5 Target population .....	45
3.6 Sample size .....	45
3.7 Sampling procedure .....	48
3.7 Eligibility Criteria.....	50
3.8.1 Inclusion criteria .....	50
3.8.2 Exclusion criteria .....	50
3.9 Data collection methods.....	50
3.9.2 Study procedure .....	53
3.9.3 Data management and analysis .....	54
3.10 Dissemination of findings .....	55
3.11 Ethical consideration.....	56
CHAPTER FOUR.....	57
4.0 Results.....	57
4.1 Socio-demographic Characteristics of MTRH employees.....	57
4.2 The prevalence of Substance Use among employees of MTRH.....	59
4.3 Factors Associated with Substance Use among employees of MTRH.....	62
CHAPTER FIVE: DISCUSSION .....	73
5.0 Introduction.....	73
5.1 Prevalence of substance use among employees of MTRH .....	73
5.2 Factors associated with substance use among employees of MTRH.....	81
5.3 Strengths and limitations .....	87
CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS .....	88
6.1 Conclusion .....	88
6.2 Recommendations.....	88
REFERENCES.....	90
APPENDICES.....	98
Appendix 1: Consent Form.....	98
Appendix 2: Individual and Environmental associated factors' Questionnaire.	100
Appendix 3: ASSIST Questionnaire.....	102
Appendix 4: Budget .....	110
Appendix 5: Time Schedule.....	111
Appendix 6: IREC Approval .....	112
Appendix 7: Hospital Approval .....	113
Appendix 8: NACOSTI Approval .....	114

## LIST OF TABLES

Table 1: The calculated sample sizes of MTRH employees for the workstation stratum.....	49
Table 1: The calculated sample sizes of MTRH employees for the workstation stratum.....	49
Table 2: Socio-demographic characteristics of MTRH employees. ....	58
Table 3: Prevalence of substance use among employees of MTRH.....	59
Figure 2:Prevalence of substance use among employees of MTRH .....	60
Table 4a: Lifetime Prevalence of substance use among MTRH employees, by gender .....	60
Table 4b: Current Prevalence of substance use among employees of MTRH, by gender and level of risk.....	61
Table 5: Bivariate analysis of the factors associated with lifetime use of: tobacco, alcohol and other substances among employees of MTRH.....	64
Table 6a: Multivariate analysis of the factors associated with lifetime tobacco use among MTRH employees .....	66
Table 6b: Multivariate analysis of the factors associated with lifetime alcohol use among MTRH employees .....	67
Table 6c: Multivariate analysis of the factors associated with lifetime other substance use among employees of MTRH .....	68
Table 7: Bivariate analysis of the factors associated with current high and moderate substance risk use of: tobacco, alcohol and other substance among employees of MTRH.....	69
Table 8a: Multivariate analysis of the factors associated with current high and moderate use risk of tobacco among MTRH employees .....	71
Table 8b: Multivariate analysis of the factors associated with current high and moderate use risk of alcohol among MTRH employees.....	71
Table 8c: Multivariate analysis of the factors associated with current high and moderate risk use of other substances among MTRH employees .....	72

**LIST OF FIGURES**

Figure 1: Factors associated with substance use among employees of MTRH.....	43
Figure 2:Prevalence of substance use among employees of MTRH .....	60

## **CHAPTER ONE**

### **1.0 INTRODUCTION**

#### **1.1 Background to the Study**

Substance use remains prevalent today, despite the use of a lot of resources, running into millions of dollars annually in prevention efforts. The United Nations recognizes this problem and in its global development agenda, under the sustainable Development Goals, a target was included to strengthen the prevention and treatment of substance use disorders, showing a recognition of substance use as a development issue in itself (UN, 2015). Through the Sustainable Development Goals, the United Nations aims to provide a more equitable and sustainable future for all people by 2030, ensuring that no one is left behind.

Disorders due to psychoactive substance use – including alcohol, drug and tobacco dependence – are the main underlying conditions ultimately responsible for the largest proportion of the global burden of disease attributable to substance use (Whiteford et al., 2016).

The global burden of disease caused by alcohol consumption is enormous, exceeding the burden of disease caused by many other diseases high on the global health agenda. Alcohol use is linked to over 200 health conditions ranging from liver diseases, road injuries and violence, cancers, cardiovascular diseases, suicides, tuberculosis and HIV among others (WHO, 2018) and although high levels of alcohol consumption have been found to be in Europe, statistics show that Africa still bears the heaviest burden of disease and injury attributed to alcohol (WHO, 2018).

In 2016, according to WHO the harmful use of alcohol resulted in some 3 million deaths (5.3% of all deaths) worldwide and 132.6 million disability-adjusted life years (DALYs) – i.e 5.1% of all DALYs in that year and mortality resulting from alcohol consumption was higher than that caused by diseases such as tuberculosis, HIV/AIDS and diabetes. Further, among men, an estimated 2.3 million deaths and 106.5 million DALYs were attributable to the consumption of alcohol while women experienced 0.7 million deaths and 26.1 million DALYs attributable to alcohol consumption (WHO, 2018). The harmful use of alcohol is therefore quite costly and distressing to the society. The Global Status Report on alcohol and health in 2018 reported that alcohol users had increased their alcohol consumption since 2000 in almost all regions except the WHO European Region. The report further noted that the prevalence of heavy episodic drinking (HED) (defined as 60 or more grams of pure alcohol on at least one occasion at least once per month) decreased globally from 22.6% in 2000 to 18.2% in 2016 among the total population, but remained high among drinkers, particularly in parts of Eastern Europe and in some sub-Saharan African countries (over 60% among current drinkers), (WHO, 2018).

Tobacco is another widely used substance and it represents the second major cause of death and the main preventable cause of lifestyle-related diseases such as lung cancer, chronic obstructive pulmonary disease and coronary heart disease (Lo et al., 2013a). According to the World Health Organization (WHO), in the 20th century the tobacco epidemic killed 100 million people all over the world and it is estimated that, during the 21st century, it could kill one billion (WHO, 2019). Further, 3.7% of the global burden of disease in 2016 was attributable to tobacco use (Whiteford et

al., 2016). Tobacco use can therefore be considered a critical international point for public healthpolicy makers.

Apart from Tobacco and alcohol other substances are increasingly gaining attention.

In 2019, according to UNODC, there were more than 11 million people injecting drugs and the number of drug users globally and in Africa was expected to rise by 11% and 40% respectively by the year 2030 (UNODC 2019). The World Health Organization reported 450,000 mortalities globally as a result of drug use in 2017, and the deaths were attributed mainly to substance overdose and to deaths related to HIV and hepatitis C acquired through unsafe injection practice (UNODC, 2018c). Further, in 2019 UNODC reported an increase in the burden of disease caused by drug use resulting from premature deaths and the number of years lost owing to disability (UNODC, 2019) and in the United States of America, overdose rates had increased significantly, particularly from opioids. In 2017, the US Department of Health and Human Services declared the opioid crisis a public emergency. However, in 2019, NSDUH reported a significant decline in opioid use disorders, from 2.0M to 1.6m in the USA. Overdose rates from non-opiates (cocaine) remained relatively constant over a long period (NSDUH, 2019). Recent reports by NSDUH, in 2019 reported a decline in opioid initiation and pain reliever misuse in the USA population while in Africa, The United Nations Office on Drugs and Crime (UNODC) World Drug Report in 2019 indicated that Africa was becoming a drug market and a redistribution point for other destinations and as a result, substance use had escalated in the continent. The increase in drug use in Africa was previously attributed to the ease of availability, affordability and accessibility of alcohol,

tobacco, cannabis and khat in the continent (UNODOC, 2012). Further, substance markets were reported to have been expanding at alarming rates in Africa, with the UN reporting a potential supply driven expansion (UNODC, 2018a).

The UNODC in 2017 warned of an increasingly alarming rate of addiction to tramadol in Africa and the non-medical use of non-controlled opioid painkillers. The use of prescription drugs for non-medical purposes was noted to be increasing, and was reaching epidemic levels globally and of concern was the number of overdose deaths which had increased especially in North America as a result of illicitly sourced prescription drugs (UNODC, 2018). We can therefore see that the trends of substance use in Africa are changing with a shift to the illicit use of prescription drugs and the expansion of substance markets.

In Sub-Saharan Africa, The UN World Drug Report in 2014 indicated that South Africa had a drug consumption rate that was two times greater than the global average and consequently, South Africa had faced high incidents of substance use rates and challenges associated with substance use disorders (Helen et al., 2014). Further, results from the South African Stress and Health Study (SASH), a study of psychiatric morbidity in South Africa indicated high lifetime prevalence (13.3 %) and early onset (21 years) of substance use disorders (Sorsdahl et al., 2012). In addition, in sub-Saharan Africa, The 2016 Ethiopian Demographic and Health Survey showed that 35% of women and about half of men (46%) reported drinking alcohol at some point in their lives. The report showed that 12% of women and 27% of men had ever chewed khat and about 4.2% of men aged 15–59 years and 0.6% of women aged 15–49 years were cigarette smokers. Smoking in younger men

population (age 20–24 years) was as low as 2.6% (EDHS, 2016). The 2015 Ethiopian national STEPS survey on risk factors for non-communicable disease reported a current (30 days) smoking rate of 4.2% (Ethiopian STEPS survey, 2015). With regards to alcohol consumption, nearly 41% had consumed alcohol during the past 30 days prior to the survey and the proportion of men who consumed alcohol (46.6%) was higher than that of women (33.5%). The survey also reported that 16% of respondents were current khat chewers (Ethiopian STEPS survey, 2015).

In Kenya, The National Authority for the Campaign against Alcohol and Drug Abuse (NACADA) carried out a survey on substance use in 2017 on the general population in the country, where among respondents aged 15 – 65 years, the prevalence of current usage of alcohol was 12.2%, tobacco use was 8.3% and Khat use was 4.1%. The survey revealed that bhang was the most widely used narcotic drug in Kenya with a current prevalence use rate of 1.0% (NACADA, 2017). Other studies done in the country reported that alcohol, tobacco, bhang, khat, heroin, cocaine, methamphetamine (Meth), and ecstasy were some of the substances most commonly used in Kenya and the use of emerging substances such as '*kuber, shisha, rohypnol, and Artane*' was becoming a major social problem (Gathu et al., 2013). These emerging psychoactive substances were noted to be under no control but were believed to cause similar or worse harm to those that were controlled (Gathu et al., 2013).

Because substance use is pervasive, affecting almost every area of daily life, including the workplace (Frone, 2006), workplace substance use has been gaining attention (Evans, 2004) given the high percentage of working adults (ages 18 and up)

in Kenya reporting substance use (NACADA, 2012). Studies have shown that substance use at the workplace threatens the quality of service, it undermines employee productivity and it may result in loss of life (Frone, 2006). Employee substance use, overall and at work, may be affected by factors that occur outside the workplace (demographic differences, personality predispositions, and expectancies regarding the outcomes of substance use) and factors that occur within the workplace (workplace culture and acceptance of its use, workplace alienation, the availability, and the existence and enforcement of workplace policies on substance use and social control at work), (Frone, 2003).

Further research supported the existence of a relation between substance use climate (culture) and employee substance use outside and inside the workplace. A study on workplace climate reported a relation between occupation and work shift as important predictors of workplace substance use culture (Frone, 2012). Individuals working a nonstandard (irregular or flexible) shift reported higher levels of workplace availability, descriptive norms and injunctive norms regarding substance use at work (Frone, 2012). The climate dimensions of physical availability of substances at work and descriptive norms (use of substances at work by employees) were the most directly manageable through workplace policy, supervision and education (Frone, 2012). A clearly set institutional policy on substance use would therefore ensure that employees especially the ones at risk, work in safe and healthy environments hence making them more productive and this is beneficial to both the employee and employer (Frone, 2003).

Substance-Related Policy Enforcement Rational-bureaucratic control strategies are grounded on the assumption that counterproductive behavior results from lack of rational and consistently enforced rules and policies (i.e., employee's lack a clear understanding of what is expected from them; Frone, 2003). The absence of organizational policy regarding substance use and/or irregular enforcement of such policy may contribute to the development or increase of substance use problems. Some researchers concluded that workers' knowledge that substance related regulations were rarely enforced seemed to encourage drinking (Biron et al., 2011). This underscores the importance of clearly set institutional policies on substance use, and programs to ensure preventive services are offered in addition to treatment and rehabilitation.

There are programs that have been in existence for a long time, that are designed to assist employees using substances and experiencing other personal and workplace issues that may impair their workplace functioning. The programs, commonly referred to as 'Employee Assistance Programs' (EAPs), seem to be the standard industry benefit and a cost-effective solution to addressing employee issues in the workplace (Attridge et al., 2009; Cowell et al., 2012) by providing assessment, short-term counseling, and referral to appropriate intervention (Richmond et al., 2014).

Screening, brief intervention, and referral to treatment (SBIRT) has been shown to be an effective model for reducing unhealthy alcohol use in primary health care settings (Whitlock et al., 2004) and is therefore recommended for use by Employee Assistance Programs (EAPs) for a variety of health problems (Solberg et al., 2008;

Whitlock et al., 2004) and although underutilized (McPherson et al., 2009) has been expanded for use in EAPs (Goplerud & McPherson, 2010). Through this model, Employee Assistance (EA) professionals can aid employees to make changes before their substance use and other issues threaten their health, jobs, and families. The SBIRT model supplies the EA professional with a systematic method for identifying substance use or mental health issues that may be underlying or exacerbating personal or work-related problems. The model also provides a structured avenue to identify employees with more severe issues and provide the appropriate referral services (Richmond et al., 2014).

Knowledge on the prevalence and associated factors to substance use would be useful in the development and improvement of screening tools and management protocols designed to link employees at the various risk categories of substance use (low risk, moderate risk and high risk), to the appropriate intervention strategies, which include prevention, treatment and rehabilitation through Employee Assistance Programs. In most instances, employees with problematic substance use or high-risk categories are easily identified and are sent to EAPs, where treatment and rehabilitation services are frequently offered to them, unlike those at low and moderate risk categories of substance use (WHO, 2010). Screening of employees for substance use followed by their categorization into the various risk categories of substance use ensures proper and timely referral to the correct interventions through EAPs.

Much of the discussions on media and in public focus on addiction, and this may be misinterpreted to mean that discussions on substance use in general are unimportant. Studies have shown that most social and health related problems occur more in substance users who are not addicted (McLellan, 2017). Although substance dependence and addiction are associated with a significant burden of disease, evidence suggest that the burden on health care systems from non-dependent, but harmful or hazardous use of substances, may be greater than the burden due to dependent use (WHO, 2010). A study done in the US population concluded that reducing substance related problems cannot occur by simply treating addictions, but by reducing substance use in the general population which will in effect reduce addictions (McLellan, 2017). Attention should therefore shift to substance use and preventive measures in order to curb the problem before complications like addictions develop.

Although substance use varies among occupations, its related problems are not characteristic of any social segment, industry, or occupation. The use of psychoactive substances by hospital employees raises many concerns, including the threat to patient care (Wu, 2010; Kenna & Lewis, 2008; Mokaya et al., 2016). Medical professionals act as advisers and behavioral models for their clients and citizens in general and their behavior will affect patient outcomes (Ficarra et al., 2011). Tobacco and alcohol use among clinicians is of particular concern, as it leads to lower rates of counselling and intervention for these substances (Frank, 2007; Frank et al., 2000; Oberg & Frank 2009). This is important as brief counselling interventions for the management of Substance use around the world are effective and of low cost (Barrowclough et al., 2001; Dutra et al., 2008), and among the few

interventions recommended by the WHO as part of the Mental Health Global Action Plan (WHO, 2010).

Many studies have shown that when HCWs smoke, they inadvertently undermine their roles in advising or assisting smokers to quit (Okeke et al., 2012). A 2008 Cochrane review demonstrated that simple advice from a doctor about quitting smoking increases the chance of a patient quitting and remaining abstinent for 12 months (Stead et al., 2008). Further, studies have shown that the lifestyle choices of health workers affect patients' health practices (Oberg & Frank, 2009), including their reported substance use (Frank et al., 2008; Voltmer et al., 2013).

Although healthcare settings offer more opportunities for access to substances for potential abuse and also for treatment, the latter may be much more difficult to access according to some researchers (O'Donovan, 2001). In addition to negative effects on the individual's physical and mental health, and on their families, substance use may undermine the individual's role as a teacher and role model for healthy lifestyles (O'Donovan, 2001). This emphasizes the importance of having optimal substance use behaviors among HCWs in order to optimize outcomes for whole patient populations considering the well-recognized importance of the workplace in health promotion. Because research has shown that medical professionals play a key role in the process of cessation of substance use especially smoking among their patients through advising and through acting as behavioral models for the patients and citizens in general (Ficarra et al., 2011), it is relevant to have information on their substance use, in order to institute proper measures to ensure good role modeling.

Bearing in mind that substance use by hospital employees risks the wellbeing of both the provider and the patient and because hospital employees represent a subtype of substance users who have access to illicit substances and are prone to both licit and illicit substance use, it is important to develop tailored intervention strategies for this specific group (Kenna & Lewis, 2008; Option & Ofulla, 2009). Research has shown that substance use decreases productivity and increases absenteeism, and this is particularly concerning in LMICs where human resources to provide health services are reported to be scarce (WHO, 2006). Therefore, research on workplace substance use especially among hospital employees, considering the effects of substance use at the workplace by this subset of employees, will be beneficial to all the healthcare stakeholders, since findings will inform policy.

Universal health coverage is to be achieved through the Sustainable Development Goals and the goal number three, subsection 3.5 mandate countries to strengthen the prevention and treatment of substance use and abuse. Research has been emphasized by World Health Organization (WHO) as one of the ways towards achieving Universal Health Coverage (WHO, 2015). The purpose of this study therefore aligns with the goal number 3 of the Sustainable development goals and hence provides information that bridges the gap in knowledge, and will contribute towards the achievement of universal health coverage in Kenya and in the world. In order to achieve universal health coverage, The Kenyan Government requires all public institutions to mainstream Alcohol and Drug Abuse Prevention programs in the workplace through a performance contracting system (NACADA, 2011). Hospitals fall under public institutions in Kenya and therefore are in the category of

institutions that adopted the performance contracting system. This therefore means that studying substance use in a hospital, like Moi Teaching and Referral Hospital (MTRH) will enable the hospital management teams access information that will be useful in policy and in the mainstreaming of substance use prevention programs and control at the workplace which is in line with the Sustainable development goal number three.

Because substance use is a global problem, resulting in high morbidity and mortality worldwide, more attention needs to be paid on establishing the extent of the problem so that related clinical interventions can be formulated to prevent, diagnose and treat the problem, including at the workplace and especially among healthcare workers in LMICs where data on health workers' substance use is scarce. In order to develop clear policies and proper intervention strategies to be used in Employee Assistance

Programs (EAPs) and any other relevant programs, data on prevalence and associated factors is invaluable. Few studies have been done in LMIC on the subject, hence creating a gap in knowledge. Most researches done on substance use among healthcare workers, and particularly hospital employees, were done in High Income Countries making it difficult to compare data. The factors associated with substance use in HICs may differ with findings in Low- and Middle-Income Countries (LMICs) due to varying demographics, sociocultural, environmental and economic status among others.

## 1.2 Statement of the Problem

The global burden of substance use cannot be overstated and hospital employees, who are health care workers, have not been spared from this scourge. The use of substances by this subset of employees who have access to illicit substances and are prone to both licit and illicit substance use (Kenna & Lewis, 2008; Otieno & Ofulla, 2009), risks the wellbeing of both the healthcare worker and the patient. Studies indicate a significant global burden of substance use among health care workers (Oreskovich, 2015; Nilan, 2019; Okeke et al., 2012).

In Kenya, a survey conducted in the eastern province in 2016, reported a lifetime substance use rate among both clinical and non-clinical health care workers of 35.8% for alcohol, 23.5% for tobacco and 9.3% for cannabis (Mokaya et al, 2016). In 2020, another study (Kolongi et al. 2020) conducted among healthcare workers in western province of Kenya reported a lifetime alcohol use rate of 33%, Tobacco 9%, Khat 5.5%, prescription drugs 4.7% among others. One study conducted at the beginning of the Covid 19 pandemic, on the harmful use of alcohol among healthcare workers, reported a rate of 43.9% for harmful use of alcohol (Jaguga et al., 2022). In all the studies mentioned on substance use among healthcare workers in Kenya, the reported substance use rates were higher than that of the general population.

The prevalence of mental illnesses among healthcare workers at the early phase of the covid 19, in the year 2020, was reported to be high based on findings of an online survey (Kwobah et al., 2021). Mental illnesses have been associated with a high rate of substance use (Richert et al., 2020) and this could explain the high rate of harmful

use of alcohol reported in one study done during the beginning of the covid 19 pandemic (Jaguga et al., 2022). This could also mean that the rate of substance use among healthcare workers in Kenya may have risen further due to the covid 19 pandemic which begun in 2019 and has been associated with a high rate of mental illnesses (Kwobah et al., 2021) as has been seen previously in other pandemic circumstances (Preti et al., 2020; Lai et al., 2020).

A survey conducted at MTRH by the Employee Assistance Program (EAP) in 2016 on substance use among its employees reported a prevalence rate of alcohol use of 65% and 11% for drug use. The survey also reported significant negative consequences of alcohol and drug use among the employees of MTRH. However, the study did not use a structured tool to collect the data, and the findings remain unpublished. In addition to the high rate of substance use among the hospital employees reported previously, the occurrence of the COVID 19 pandemic occasioned a rise in mental illnesses among healthcare workers (Kwobah et al., 2021), and an increase in their use of psychoactive substances particularly alcohol (Jaguga et al., 2022). The need for further studies on substance use among healthcare workers and especially among MTRH employees cannot therefore be overstated.

Various institutions have established employee assistant programs to assist employees manage their social problems including substance use and its related problems. However, most institutions focus on employees with substance use disorders and are already causing problems at the workplace. Studies show that the use of substances, even at low to moderate risk levels, may exert a higher total burden on the public health system than harmful, high-risk use due to the large

proportion of the population at stake falling in the low to moderate risk categories (Humeniuk et al. 2010). This is especially concerning, as the use of these substances, even at these levels, remains associated with health problems of measurable burden at population levels, compared to the people categorized as high-risk users who might individually experience higher disease burden, but not contribute as much to the global burden due to their smaller number (Warren & Murray 2013; Thompson et al. 2014; Crean et al. 2011). Institutions including hospitals, therefore need to devise and continuously improve protocols for screening and assessment, and for categorization of individuals with the intention of linking them to the appropriate interventions through programs like EAPs, which have been shown to be effective (Whitlock et al., 2004).

There is scarcity of data in LMICs on the extent and factors associated with substance use among HCWs (Mokaya et. al, 2016) especially in Kenya. In MTRH, the last survey done on substance use among employees was done in 2016, which is more than five years ago. In order to develop and to improve protocols for screening and assessment, and for linkage (referral) of employees to intervention programs through the employee Assistant Programs, and for implementation of specific intervention strategies among this subset of workers, baseline investigations on the extent of the problem and the associated factors need to be done.

### **1.3 Justification**

Both formal and informal worksites are very important public health settings. This is because a majority of adults spend considerable amounts of time in these settings which in turn play a significant role in their health and wellbeing (Chakua, 2013). It is therefore important for employers to ensure healthy work environments and healthy behaviors for their employees in order to increase the overall productivity for the organizations served and at the same time improve employee wellness.

Research on prevalence of alcohol and other substance use in the workforce has received a fair amount of attention in the recent past. From studies carried out in HICs, reported prevalence rates emphasize the importance of understanding workplace substance use (Frone, 2012) since the negative impact of substance use among healthcare workers is substantial. It has been shown that substance use decreases productivity and increases absenteeism among employees in general. This is particularly concerning in healthcare service provision in Low- and Middle-Income Countries where human resources to provide health services are scarce (WHO, 2010). Additionally, substance use results in negative effects on the individual's physical, mental and social health and may undermine the individual's role as a teacher and role model for healthy lifestyles (O'Donovan, 2001). The lifestyle choices of healthcare workers have been shown to affect patients' health practices (Frank et al. 2013; Oberg & Frank 2009), including their reported substance use (Frank et al. 2008; Voltmer et al., 2013). Other studies have also shown that medical professionals play a key role in the process of cessation of substance use especially smoking among their patients since they act as advisers and behavioral models (Ficarra et al., 2011). This emphasizes the importance of having optimal substance

use behaviors among HCWs in order to optimize outcomes for whole patient populations.

Although healthcare settings offer more opportunities for access to substances for potential abuse and also for treatment, it may be much more difficult to access the substances for treatment purposes (O'Donovan, 2001). The use of substances by healthcare workers raises many other concerns, including the threat to patient care (Wu, 2010, Kenna and Lewis, 2008; Mokaya et al., 2016). Tobacco and alcohol use among clinicians is of particular concern, as it leads to lower rates of counselling and intervention for these substances (Frank, 2007; Frank et al., 2000; Oberg and Frank 2009). This is important as brief counselling interventions for the management of Substance use around the world are effective and of low cost (Barrowclough et al. 2001; Dutra et al. 2008), and among the few interventions recommended by the WHO as part of the Mental Health Global Action Plan (WHO 2010).

Many studies have shown that when HCWs smoke, this inadvertently undermines their roles in advising or assisting smokers to quit (Okeke et al, 2012). A 2008 Cochrane review demonstrated that simple advice from a doctor about quitting smoking increased the chance of a patient quitting and remaining abstinent for 12 months (Stead L. et al, 2008). Although the damages of smoking are well known, several studies have shown a high prevalence of smokers among health professionals, who do not always set a good example for their patients and colleagues (Ficarra et al., 2011). In fact, it is evident that health professionals could better persuade patients to stop smoking if they themselves are not smokers. Furthermore, other studies have shown that smokers who team up with their

healthcare providers have more chance to quit than trying on their own. Since physicians are widely viewed as examples by the community, their patients and their colleagues (Ficarra et al., 2011), hospitals should represent places suitably appointed to develop a culture of health promotion.

It has also been noted by previous researchers and further by World Health Organization, that the working environment has become stressful due to manpower shortages, and poor facilities especially in resource limited countries in LMIC. This stressful working conditions especially in health care facilities in Low- and Middle-Income Countries (LMIC), predispose health workers to substance use (Otieno & Ofulla, 2009). This underscores the importance of studying substance use at the workplace in order to institute appropriate intervention measures.

The use of substances at the work place and impairment from use has a more direct relevance to employers in terms of workplace safety and productivity. In addition to its prevalence, overall employee impairment from alcohol and illicit substances may lead to work-related absenteeism (Frone, 2008b) and to injuries incurred outside the workplace (Cherpitel, 2007; Macdonald et al., 2003) and health-related problems (Rehm et al., 2006) that may have relevance to employers. For example, long-term low to moderate alcohol use is associated with liver disease and pancreatitis (Murray 2013), while short-term low- risk alcohol use is associated with risky sexual behavior (Thompson et al. 2005) and motor vehicle injuries (Thomas and Rockwood 2001). Acute cannabis use can affect cognition for weeks after its use, and long-term (even occasional) cannabis use is associated with long-term cognitive impairment (Crean et al. 2011). Work-related employee substance use and impairment results in

decreased productivity and increased risk of accidents and injuries at work (Frone, 2008). In addition, exposure to employee substance use in the workplace is related to several negative outcomes (poor workplace safety, increased work strain, and decreased morale) among workers who do not use substances at work (Frone, 2009). Again, medical professionals act as advisers and behavioral models for the citizens and their behavior will affect patient outcomes (Ficarra et al., 2011). The use of substances at the workplace is therefore important and needs attention since it affects the individual, co-workers and employers. To ensure that employees especially the ones at risk, work in a safe and healthy environment and to make them more productive, institutions need to clearly set policies on substance use. This would be beneficial to both the employee and employer (Frone, 2003).

An effective workplace substance use control and management program entails critical understanding of segments of the employee population who are users of substances. Identification of characteristics of users helps the program designer to tailor the program paying attention to the unique characteristics of these sub-groups (NACADA, 2012).

The impact of substance use among the public sector employees in Kenya is significant. Past NACADA records showed that current alcohol users (48.5%) had a proportionately higher likelihood of receiving a warning from the employer for any offence compared to current non-users (32.1%). The results also showed that 7.2% of current alcohol users drunk on a daily basis, 8.8% had failed to go to work in the last one year due to a hangover and 9.2% took alcohol in the morning to enable them to start working (NACADA, 2011). Furthermore, NACADA in their 2006 report

noted that some of the effects of substance use were absenteeism and work-related accidents and concluded that substance use at the workplace posed a great challenge to the growth and development of organizations in Kenya (NACADA, 2006).

Through the performance contracting system, The Kenyan Government requires all public institutions to mainstream Alcohol and Drug Abuse Prevention programs in the workplace (NACADA, 2011). Hospitals fall under public institutions in Kenya and therefore are in the category of institutions that adopted performance contracting system. This therefore means that studying substance use at MTRH will enable the hospital management team meet the requirement and to access information that will be useful to the EAP of the institution.

The lack of enough data remains a significant gap in the knowledge on the extent of substance use in the country. This challenges the development of evidence-based policy and programs to address substance use in the country (Mokaya et al., 2016) and suggests the need for specific inquiry into substance use, abuse and presence of substance use disorders in the general population, including among healthcare workers in order to undertake preventive and public health measures. In order to address this challenge of lack of sufficient data, studies need to be carried out to identify problem areas and to develop tailored intervention strategies for healthcare workers in the various risk categories of substance use.

In Kenya, studies have been carried out on substance use in public and private institutions in general, and among college, secondary and primary schools and prison populations (Kinyanjui & Atwoli, 2013; Atwoli et al., 2011; Lo et al., 2013), but data on substance use among healthcare workers remains scarce. The study on

the prevalence of substance use among healthcare workers that was carried out in 2016 (Mokaya et al., 2016), in the Eastern part of Kenya looked at the prevalence of substance use among healthcare workers working in outpatient facilities. The study was also carried out in 2016 which is several years ago. Another study was carried out on substance use among healthcare workers in Western Kenya in 2020 (Kolongei et al., 2020). The two studies were done in different regions of the country, and MTRH is located in the rift valley, which could have different prevalence rates. The survey conducted by NACADA in 2017 reported differing prevalence rates for substance use in different parts of the country, for instance, tobacco use was higher in Eastern province compared to the rest of the country (NACADA, 2017). Because the society is dynamic, with changing patterns of use (Davoli et al., 2007) and availability, continuous assessments of substance use needs to be carried out to check for changing prevalence patterns and trends. Although a similar study was carried out at MTRH in 2016, the study did not use a standardized tool in data collection and the study findings were not published. MTRH being a national health facility at the highest level in Kenya, draws its workforce from diverse backgrounds in different regions of the country, and it also hosts a wide variety of hospital departments. Carrying research in this kind of setup will give a view representative of hospital setups in Kenya. To facilitate establishment of structures to mainstream prevention and mitigation programs in hospitals, a baseline survey to establish the extent of the problem and to determine the factors associated with it, needed to be done.

This study therefore was done to provide information on the prevalence of substance use and its associated factors in order to increase the information available on substance use in LMICs and to provide useful data to be utilized by future researchers and by MTRH management in policy establishment, intervention strategy development and in EAP improvement.

#### **1.4 Significance**

Universal health coverage is to be achieved through the Millennium Development Goals. The Goal number three, subsection 3.5 mandated countries to strengthen the prevention and treatment of substance use and abuse. Research has been emphasized by World Health Organization (WHO) as one of the ways towards achieving Universal Health Coverage (WHO, 2013). This study will therefore provide information that will bridge the gap in knowledge, and will contribute towards the achievement of universal health coverage in Kenya and in the world.

Programs offered through work places can reach a large segment of the working age group, including groups who may be at a particular risk like healthcare workers (Frone, 2003). There is therefore need to establish the extent of substance use among healthcare workers in order to have a basis for resource allocation in prevention, diagnosis, treatment, and rehabilitation of affected persons.

The information arising from the study will be useful to the management of Moi Teaching Referral Hospital and especially the human resource department since this kind of information is useful in policy, and in EAP improvement. Through the study, the hospital will be able to review the success of the EAP currently in place through comparing previous prevalence figures with the results from the study.

This study may have also benefitted employees who might not have been aware of their problematic use of substances through sensitization achieved through answering the ASSIST questionnaire. This therefore means that employees may have been enabled to examine themselves, identify problem areas and deal with them early before they develop complications like substance use disorders. The society will also benefit when loved ones with substance use, and substance use disorders acknowledge their problematic substance use and seek assistance.

Lastly, the study aimed at ensuring health workers welfare was cared for with regard to substance use, which according to Kenna and Lewis (2008), ensure the workers work professionally and discharge their duties ethically, skillfully and safely which will in effect benefit the whole population.

## **1.5 Objectives**

### **1.5.1 Broad Objective**

To determine the prevalence and factors associated with substance use among employees of MTRH

### **1.5.2 Specific objectives of the Study**

1. To determine the prevalence of substance use among employees of MTRH.
2. To determine the factors associated with substance use among employees of MTRH.

## **1.6 Research Questions**

### **1.6.1 Main Research Question**

What is the prevalence and the factors associated with substance use among employees of MTRH?

### **1.6.2 Specific Research Questions**

1. What is the prevalence of substance use among employees of MTRH?
2. What are the factors associated with substance use among employees of MTRH?

## **CHAPTER TWO**

### **2.0 Literature Review**

#### **2.1 Introduction**

This chapter reviews literature on research done by other scholars on substance use. The chapter has been organized into subsections covering the objectives of the study. A review of the various methodologies employed by researchers on the subject under study is presented at the end, before the conclusion of the chapter.

#### **2.2 Prevalence of Substance Use in the Society and At the Workplace**

Substance use and its related health problems is increasingly becoming a major public health matter of concern in the global scene. Recent research findings estimate about 190 million substance users globally, and around 40 million seriously ill or injured substance users are identified each year (Woldia, 2019). In 2015, WHO estimated more than 450,000 deaths per year, resulted from psychoactive substance use. Substance use accounted for about 1.5% of the global burden of disease, while injection drug use accounted for an estimated 30% of new HIV infections outside sub-Saharan Africa and contributed significantly to the epidemics of hepatitis B and hepatitis C in all regions (UNODC, 2018c). Alcohol, khat, cigarette, hashish, and other illicit drugs like cannabis and cocaine were among the most used substances in the world (Gebremariam et al., 2018). About 275 million people worldwide which is roughly 5.6% of the global population aged 15-64 years used substances at least once during 2016 (UNODC, 2018c). With the use of substances, 31 million people suffered substance use disorders and opioids were noted to cause the most harm, accounting for 76% deaths and injection drug users endured the greatest health risks.

In 2016, there were 10.6 million injection drug users and more than half of them live with hepatitis C and about an eighth live with HIV (UNODC, 2018c). The 2015 Ethiopian national STEPS survey on risk factors for non-communicable disease reported that 4.2% of the survey participants were current (30 days) smokers. Only 3.1% young people aged 15–29 were current cigarette smokers. With regard to alcohol consumption, nearly 41% had consumed alcohol during the past 30 days prior to the survey. About 36.6% of young people aged 15–29 years were current alcohol users. A study done in Kenya found a lifetime substance use prevalence rate of 69.8% among adults which was significantly higher than the 41% rate found among high school students in Kenya (Atwoli et al., 2011). Substance use among prisoners at the Eldoret G.K. Prison in Kenya was 66.1% which is not far from the rate found in the adult population in the country (Kinyanjui & Atwoli, 2013).

Overall impairment from and work-related use of alcohol and illicit substances are prevalent in the workforce. In The U.S. workforce, 73.6% of the workforce (92.5 million workers) used alcohol, 30.6% (38.4 million workers) drank enough to become intoxicated, and 22.6% (28.4 million workers) experienced a hangover during the preceding 12 months (Frone, 2008b). The prevalence rates for illicit substance use indicated that 14.1% (17.7 million workers) used at least one illicit substance during the preceding 12 months (Frone, 2008b). Data from other countries like in the UK where 13% of the workforce reported to have used an illicit substance during the preceding 12 months (Biron et al., 2011), highlight the scope of the problem. In Kenya, a survey conducted by NACADA in 2017, on public sector employees reported that 57.9% of employees had drunk alcohol, 22.8% used tobacco

products, 15.9% used *miraa*, 6.6% used bhang and 1.3% used narcotics (mandrax, heroin, and cocaine) at least once in their lifetime. In comparison to the National Prevalence, lifetime usage of alcohol in the public sector (57.9%) was markedly higher compared to the rest of the country (39.2%), lifetime usage of tobacco in the public sector (22.8%) was slightly lower compared to the rest of the country (24.5%), lifetime usage of *miraa* in the public sector (15.9%) was slightly higher compared to the rest of the country (11.3%), and lifetime usage of bhang in the public sector (6.6%) was slightly higher compared to the rest of the country (6.5%). In addition, 33.3% of employees in the public sector were currently using alcohol, 8.5% were using tobacco, 3.8% were using *miraa*, 1.1% were using bhang and 0.4% were using narcotics (mandrax, heroin, Cocaine). In comparison to the national prevalence, current usage of alcohol in the public sector (33.3%) was markedly higher compared to the rest of the country (13.6%), current usage of tobacco in the public sector (8.5%) was slightly lower compared to the rest of the country (9.1%), current usage of *miraa* in the public sector (3.8%) was slightly lower compared to the rest of the country (4.2%), and current usage of bhang in the public sector (1.1%) was slightly higher compared to the rest of the country (1.0%).

### **2.3 Prevalence of substance use among healthcare workers.**

The healthcare workforce is also involved in psychoactive substance use (Oreskovich et al., 2015; Wu, 2010; Kenna & Lewis, 2008). Most studies on healthcare workers' substance use have been conducted in a few high-income countries. WHO found among HCWs the lifetime and current use rates of most substances lower than that of the general population in most HICs (WHO 2010a).

However, the main finding of a multicenter cross-sectional survey was a current smoking prevalence as high as 44% among hospital healthcare professionals from five Italian cities. This smoking rate was twice the rate of the general Italian population aged 15 years or more (21%) estimated in 2008, (Ficarra et al., 2011). In 2006 reported prevalence was 31% (Masia et al, 2006), and in 2008, only 25.8% smoking workers were reported (Crave et al, 2008). In 2020, the current smoking rate among Italian health professionals working in a cancer center was 17.8% (Bafunno et al., 2021). In all the cases studied the reported healthcare professional smoking prevalence was higher than that of the general population. In LMICs, studies done on substance use among healthcare workers have reported varied results, with higher alcohol use rates and both lower and higher smoking rates of substance use among HCWs compared to the general population (Kolongei et al., 2020; Mokaya et al., 2016; Okeke et al., 2012). A study done in South Africa, on smoking and alcohol use among healthcare workers in 2012, reported a high smoking rate of 11.1% among HCWs in KwaZulu Natal province, although the rate was lower than the national average of 21.4%. The lifetime prevalence of alcohol use reported was 53.6% which was higher compared to the rate for the general population in South Africa (Okeke et al., 2012). In the same study the smoking rate among the paramedics (31.7%) was high and was noted to be a cause for concern. In Kenya a study on substance use among healthcare workers conducted in the eastern part of Kenya (Mokaya et al., 2016) reported a prevalence rate that was generally higher than that seen in the general population though lower than reported rates among many HCWs globally. Reported lifetime use for alcohol was 35.8%, 23.5% for tobacco, 9.3% for cannabis, 9.3% for sedatives, 8.8% for cocaine, 6.4% for

amphetamine-like stimulants, 5.4% for hallucinogens, 3.4% for inhalants, and 3.9% for opioids. Tobacco and alcohol were also the two most commonly used substances in the previous three months (Mokaya et al., 2016). Another study done in 2016, by the EAP of MTRH (MTRH EAP Survey report, 2016) reported a lifetime prevalence rate of tobacco use of 33%, 11% for alcohol use and 6% for bhang use, Miraa use at 3% and pain killers was 9%. The results for this study were however not published and the study did not use a validated questionnaire. In 2020, a study was also done on substance use among HCWs in Western Kenya, and the lifetime prevalence of alcohol use was estimated to be 33%, tobacco use was 8.9%, Inhalants use was 1.7%, Khat use was 13%, Prescription drug use was 4.7%, Cannabis use was 1.3%, and other drug use was 1.3% (Kolongi et al., 2020). The prevalence of current use in the same study was 15.32% for alcohol, 3.40% for Tobacco and 1.73% for prescription drugs. The rest of the substances had a current use rate of less than 1%. The rates reported in Kenya show a higher prevalence of substance use among healthcare workers compared to the findings from the general population although the general population studies done by NACADA in 2017 interviewed persons aged 15 to 65 years and this may have lowered the rates when compared to rates from studies done among healthcare workers, who are all adults and mostly fall in the age category above 25 years of age. The high rates of substance use reported among HCWs in both HICs (Baldisseri, 2007; Gastfriend, 2005) and LMICs (Kolongi et al., 2020; Mokaya, et al., 2016; Okeke et al., 2012) may imply failure to adhere to a healthy lifestyle by the same professionals who are in charge to support patients in improving their behavior.

The pattern of substance use reported among healthcare workers mirrors the pattern seen in the general population in Kenya where alcohol is the most commonly used substance, followed by tobacco and khat while Cannabis is reported to be the most commonly used Narcotic substance and other substances follow with varied prevalence (NACADA, 2017). This pattern is also seen in WHO reports on general world patterns (Wu, 2010).

Although the pattern of substance use appears to be similar in the studies discussed, the UNODC in 2019 raised an alarm stating that Africa was becoming a substance redistribution point for other destination and predicted a consequential rise in substance use in the continent. This aspect, together with the emergence of the covid 19 pandemic, may change the substance use landscape in Africa.

#### **2.4 Factors Associated with Substance Use among Healthcare workers**

Understanding the predictors of substance use is important in determining targets for intervention and in determining intervention strategies. The relationship between use of substances and background characteristics such as gender, age, education level, marital status, job category and nature of employment with substance use have been studied widely (NACADA, 2012). Other factors, such as economic status, peer influence, availability of substances, co-occurring mental illnesses and place of residence have also been studied. However, few studies have explored the predictors of substance use among HCWs in LMICs, and especially in Kenya. Policy makers and researchers should be interested in these predictors since substance use can undermine employees' health and productivity (Frone, 2003).

Gender disparities do exist with regard to substance use. When we look at gender differences, we see that across regions, men are more likely to drink than women. This gender difference appears to be lowest in countries where the overall prevalence of drinking is high. Where drinking prevalence is low-to-mid range, the prevalence of drinking in women tends to be significantly lower and often less than half the rates of men (WHO, 2018). Male gender is significantly associated with lifetime alcohol and tobacco use (Kinyanjui & Atwoli, 2013). Moreover, past research among employed adults reveal that men are more likely than women to engage in substance use at work (Frone, 2003). Again, WHO reports show in almost every country that men are more likely to have a substance use disorder than women (WHO, 2018). United Nations in 2018 reported that Women's substance use differed greatly from that of men. Non- medical use of tranquillizers and opioids was common. However, the prevalence of the non-medical use of opioids and tranquillizers among women remained at a comparable level to that of men, if not actually higher. On the other hand, men were far more likely than women to use cannabis, cocaine and opiates. While women who used drugs typically began using substances later than men, once they initiated substance use, women tended to increase their rate of consumption of alcohol, cannabis, cocaine and opioids more rapidly than men. This has been consistently reported among women who use those substances and is known as "telescoping". Another difference noted was that women were more likely to associate their substance use with an intimate partner, while men were more likely to use substances with male friends (United Nations, 2018).

In a Kenyan study, reported substance use rates were higher among male HCWs than female HCWs for all substances— with the exception of hallucinogens for lifetime use and sedatives for past three months' use (Mokaya et al., 2016). This is similar to the findings from NACADA (2012) and other studies conducted on the Kenyan general population (Atwoli et al. 2011; Kinoti et al., 2011; Odek- Ogunde & Pande-Leak 1999; Othieno et al., 2000), as well as specific studies of HCWs from other countries (Frank & Segura, 2009; Underwood et al., 2008; Frank, 2007). This might be explained by lower peer pressure to use (Borsari & Carey 2006), greater social sanctions for substance use or abuse (Nolen-Hoeksema, 2004), and increased susceptibility to negative effects of some substance use in females compared to males (Nolen- Hoeksema, 2004).

While female HCWs in a Kenyan study (Mokaya et. al, 2016) reported low levels of substance use compared to that of females in HICs, they reported higher rates of substance use than other Kenyan women and women from many LMICs; and higher rates than Kenyan male HCWs for sedatives (WHO, 2010a; NACADA ,2012). The reasons for this are unknown and warrant further study.

In all WHO regions, females are less often current drinkers than males, and when women drink, they drink less than men. Worldwide, the prevalence of women's drinking went down in most regions of the world, except in the South-East Asia and Western Pacific Regions, but the absolute number of currently-drinking women has increased in the world (WHO, 2013).

The highest prevalence rates of smoking have been reported among men in LMICs (WHO, 2014). In the 2015 Ethiopian national STEPS survey on risk factors for non-communicable disease, the proportion of men who consumed alcohol (46.6%) was higher than that of women (33.5%). Similar findings are reported in the Kenyan general population by NACADA (NACADA, 2017; NACADA, 2019) and in other studies conducted on different groups within the population in Kenya (Atwoli et al. 2011; Kinoti et al., 2011; Odek- Ogunde & Pande-Leak, 1999; Othieno, et al., 2000). Being male was a key predictor of both lifetime and previous three months' substance use rates among HCWs in the studies done in Kenya (Kolongi et al., 2020; Mokaya, et al., 2016). The findings were similar to reports from a South African study, in which male sex was associated with alcohol and other substance use among HCWs (Okeke et al., 2012) as well as specific studies of HCWs from HICs countries (Frank et al., 2007; Frank & Segura, 2009; Underwood & Fox, 2000).

In 2001, healthcare personnel smoking prevalence was 36.0% in males and 36.7% in females in Italy (Muzi et al, 2011). The rate was slightly higher for females although the rates are within the same range. In a study done on smoking among healthcare workers in Sicily, the rate of smoking for men (34.5%) was slightly higher than the rate of smoking among females (33.6%) (Proietti et al, 2006), although the rates were also within the same range. This might be explained by lower peer pressure to use (Borsari & Carey, 2006), greater social sanctions for substance use or abuse (Nolen- Hoeksema, 2004), and increased susceptibility to negative effects of some substance use in females compared to males (Nolen- Hoeksema, 2004).

However, lifetime and past three months' use of hallucinogens and sedatives in one Kenyan study (Mokaya et al, 2016), was higher among the females. The use of sedatives and tranquilizers in general, and the use of Opioids have been reported to be higher among females in the world (United Nations, 2018) and this may explain the high rates of sedative and tranquilizers use reported among Kenyan female HCWs. Although female HCWs in Kenya have reported low levels of substance use compared to that of females in HICs, they reported higher rates of substance use than other Kenyan women and women from many LMICs (WHO, 2010a; NACADA, 2017; Mokaya et al., 2016; Kolongei et al., 2020; Okeke et al., 2012).

Socio-economic factors have been associated with substance use. NACADA reported that 19.8% of people in the highest income group in Kenya used alcohol currently compared with 13.2% in the lowest income group, and this is a commonly observed association, especially for those with a college education (Atwoli et al., 2011; NACADA, 2012). Lower levels of education and poor employment status have been associated with cannabis use (Kinoti et al., 2011). Among inmates in Eldoret GK prison, income status was found to be significantly associated with tobacco chewing with those with some source of income having lower odds of chewing tobacco compared to those with no income (Kinyanjui & Atwoli, 2013).

There were considerable differences in smoking prevalence between socio-economic groups in a study on HCWs in SA but this marginally failed to be statistically significant ( $P = 0.052$ ). Those in the lower socio-economic group had the highest current smoking rate at 20.0%. This was more than twice the rate among those in the

middle-income group of 10%. The upper socio-economic group had the lowest current smoking rate at 3.8%, which was about a fifth of the rate in the lower group (Okeke et al., 2012). A similar trend is seen in Australia, where individuals in the lower socio-economic group had a higher smoking rate of 26.0%, compared to 13.0% in the upper socio-economic group (Paul et al., 2014).

Kenyan and other global studies show that increasing age is a risk factor for substance consumption in the general population (Lo et al. 2013). Studies done on substance use among medical students and physicians have shown higher rates of substance use with increasing age (Frank et al., 2008). Some studies have however, shown no relationship between substance use and age (Kinoti et al., 2011). Among HCWs in Kenya, there was no statistically significant difference in age between HCWs reporting lifetime substance use and those not reporting it (Mokaya et al., 2016).

Place of residence has been associated with substance use. Living in an urban residence was significantly associated with a lifetime alcohol use and those living in urban areas had higher odds of using any substance compared to those living in rural areas in Kenya (Kinyanjui & Atwoli, 2013). Lifetime substance use among healthcare workers has been associated with living in an urban residence in Kenya (Mokaya, et al., 2016). None of the studies done among HCWs in Kenya looked at the associations with current substance use.

Those reporting lifetime substance use had a statistically significantly higher level of education than those not reporting it among inmates in a prison in Eldoret (Kinyanjui & Atwoli, 2013). Among HCWs in Kenya, no association was found between substance use and level of education (Kolongei et al., 2020; Mokaya et al., 2016), but this could be explained by the likelihood of having a majority of the health workforce having achieved a higher level of education.

Marital status is another factor associated with substance use. However marital status was not associated with overall substance use (Kinyanjui & Atwoli, 2013) among inmates in a Kenyan prison, although unmarried individuals were more likely to use alcohol, cigarettes, chew tobacco and use cannabis compared to those that were currently married. Alcohol use has been significantly associated with being unmarried in other studies (Power et al., 1999). Harmful alcohol use was associated with being unmarried among Kenyan HCWs (Jaguga et al., 2022).

Regarding age, research shows that the prevalence of alcohol and substance use increases from early adolescence until it peaks and begins to drop during the latter part of early adulthood (Frone, 2003). Increasing age has been associated with substance use in the general population (Lo et al., 2013) and among physicians and medical students (Frank et al., 2008). However, the study done in Kenya on substance use among inmates in a prison in Eldoret reported no association between age and substance use. Among HCWs in Kenya, substance use was not associated with age (Mokaya et al., 2016; Kolongei et al., 2020).

The use patterns of various substances vary among healthcare workers. Physicians reported prescribing controlled substances for themselves and due to substance access, pharmacists tend to self-medicate and have the opportunity to titrate their doses (Kenna & Lewis, 2008). Physicians have relatively easy access to psychoactive substances, and many have high levels of work-related stress, frequent contact with illness and death, and disrupted sleep and social life.

A review summary of literature concerning use by doctors (physicians), nurses, dentists, undergraduates and other healthcare workers revealed that self-medication is common among doctors. Specific specialties are noted to be at higher risk, including emergency medicine, psychiatry, anesthetics, and nurses in high stress specialties (O'Donovan, 2001). This shows that the pharmacological knowledge of a drug does not prevent its use and the consequence of dependence and addiction. With the nursing profession, substance access and a facilitating social environment has resulted in higher rates of substance use. Among the dentists, alcohol use is thought to be the problem as opposed to controlled substance use (Kenna & Lewis, 2008). A high prevalence of smoking is seen among post-graduate students, auxiliary employees, nurses and nursing students and the lowest among medical doctors in Italy (Ficarra et al., 2011). However, another Italian study conducted revealed no statistically significant differences in the smoking rate across occupational departments: clinical, surgery and others (diagnostics and administration) (Bafunno et al., 2021).

In South Africa, when smoking was analyzed according to professional categories, clerks and data capturers had the highest current smoking rate of 27.3% followed by allied health workers, 16% doctors, 11.7%, nurses, 8%, and lastly student nurses with the lowest rate, 7.5%. Paramedics, when separated from allied health workers, had a very high smoking rate at 31.7% and this was noted to be a cause for concern (Okeke et al., 2012). No studies have been done on the various cadres in healthcare in Kenya. The studies done on substance use among healthcare workers in Kenya categorized the healthcare workers into clinical and non-clinical workers and there were no statistically significant differences in the two groups (Kolongi et al., 2020; Mokaya et al., 2016).

Mental illnesses frequently co-occur with substance use disorders (Richert et al., 2020) and in pandemic circumstances (Preti et al., 2020; Lai et al., 2020) like in the recent emergence of the Covid 19 Pandemic, a rise in mental illnesses has been witnessed among healthcare workers (Kwobah et al., 2021) and in the general population (Vasilj et al., 2020). It is expected that the use of substances will increase among healthcare workers and among other populations due to high level of psychological distress and mental illnesses anticipated during the covid 19 pandemic. This could explain the high rate (43.9%) of harmful use of alcohol reported in one study done among healthcare workers in Kenya during the beginning of the covid 19 pandemic (Jaguga et al., 2022).

The absence of organizational policy regarding substance use and/or irregular enforcement of such policy may contribute to the development or increase of substance use problems (Martin et al., 1996). Studies have shown that workers'

knowledge that substance related regulations were rarely enforced seemed to encourage drinking (Ames et al., 2000). However, a number of ethnographic studies (Ames et al., 2000) suggest that the effect of substance-related policy may vary as a function of the norms associated with drinking. More specifically, these studies suggest that in firms or units characterized by less permissive drinking norms, policy enforcement may decrease substance use, whereas in firms or units characterized by more permissive drinking norms, supervisory policy enforcement may create a conflict between management and workers, attenuating any constraining effect that policy enforcement may have on substance use and perhaps even motivating employees to increase their substance use.

While prior research tends to focus on norms related to alcohol consumption (“drinking norms”), empirical evidence suggests that workplace drinking climate/norms have an impact on both employee alcohol and illicit drug use. Studies have shown that normative beliefs concerning the drinking of an individual’s best friend were highly predictive of both heavy drinking and drug use on the part of the individual (Ames et al., 2002). Evidence also suggests that work-related drinking norms have a broader impact on *overall* employee alcohol and illicit drug use and exerts an influence on substance-related behaviors outside the workplace (Midford, 2005).

Workplace substance use climate according to some researchers, is comprised of three dimensions (Ames et al., 2000). The first dimension is the perceived physical availability, or, the ease of obtaining and consuming alcohol or drugs during work hours. The second dimension represents descriptive norms, or, the extent to which an

individual's workplace peers use substances, or work while impaired by alcohol or drugs at work. The third dimension represents injunctive norms, or, the extent to which an individual's coworkers approve of using or working under the influence of alcohol or drugs at work. Previous studies confirm that employees' consumption patterns are malleable to substance use norms. A positive association between the degree to which individuals reported that their colleagues were tolerant of drinking and the degree to which those individuals experienced drinking problems themselves has been reported (Ames et al., 2000).

With regards to workplace physical availability of substances, studies have shown that ease in obtaining or using substances at the workplace increases the likelihood of substance use among employees (Frone, 2003). Among adolescence, substance use was associated with availability at home and the association was stronger for other substances as compared to alcohol (Broman, 2016). However, models developed in North America may be only partly generalizable to other countries and, perhaps most importantly, a different set of cultural values and orientations with respect to the link between work and substance use.

Among HCWs, socializing with abusers has been associated with alcohol use (Kenna & Lewis, 2008). In other studies, on substance use among workers in general, exposure to co-workers who use substances was shown to increase the likelihood of substance use (Frone, 2003). In Kenya peer influence or the use of substances by colleagues has been associated with substance use (Kolongei et al., 2020). As with any attempt to change negative behavioral patterns, change agents (i.e., supervisors) need to better understand and set aside employees' preconceptions

in favor of substance use, as these may influence the success of substance-related policies and programs (Piderit, 2000).

## **2.5 Conclusion**

Studies on substance use within the health workforce remains scanty in LMIC especially in Kenya (Mokaya., 2016) and the prevalence of substance use among health workers and its associated factors vary across regions with most prevalence studies having employed the cross-sectional study design to determine extent and associations (NACADA, 2012). There is therefore is need to carry out more studies on substance use among healthcare workers in LMICs, using standardized tool for data collection, in order to generate knowledge to be used in further research, and in the development, implementation and improvement of policies and intervention programs.

## **CHAPTER THREE**

### **3.0 METHODOLOGY**

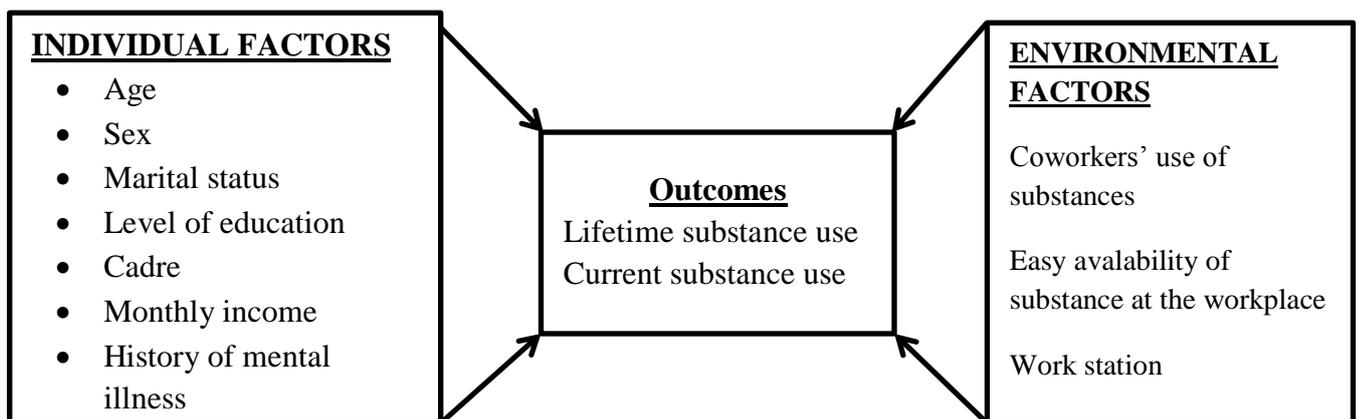
Investigating the prevalence of substance use among healthcare workers comes with its own challenges. There are limitations in making comparisons across studies due to different definitions used to describe substance use and the health workforce, and different methodologies of data collection and analysis (Stuart Gregory, 2000). Self-reported substance use may be questioned on validity, as may the representativeness of the respondents. Variable response rates are seen in several of the substance use research papers. Non response rate on a health care professional's health survey in the US was 31% (Kenna & Lewis, 2008), while in Kenya, the non-response rate was 12.7% (87.3% response rate) (Mokaya et al., 2016). The response rates vary across countries and regions. Further, the demographic compositions of the professionals in the healthcare field differ (O'Donovan, 2001). The difference may make it difficult to draw conclusions and make inferences. This section however presents the methodology used in this study with the rationale clearly discussed in each section.

#### **3.1 Study Design**

This was a quantitative study, that employed the cross sectional study design. The cross-sectional study design is most preferable in prevalence studies since it saves time and is useful in determining associations (NACADA, 2012). Most studies on substance use are self-reported descriptive cross-sectional prevalence studies (O'Donovan, 2001). It would be wise therefore to employ the same design for purposes of comparability, to save on time, and to minimize costs.

### 3.2 Conceptual Framework

This study took a broad outlook in examining the predictors of both overall and on job substance use with the aim of determining the factors that are relevant to policy makers and EAP program personnel, in designing management strategies. Employee substance use, both overall and at the workplace, is influenced by factors that are both internal and external to the workplace (Frone, 2003) and on the basis of past theoretical and empirical research, ten factors were identified. The factors were categorised into individual and environmental factors which all influence substance use both outside and within the workplace and can be influenced through policy and through various prevention strategies. The individual factors included age, sex, level of education, Marital status, Cadre and Monthly income, and a history of mental illness(es). Environmental factors included Work station, Co-workers' substance use, and Substance availability. Figure 1 illustrates the measures as conceptualized in the study.



**Figure 1: Factors associated with substance use among employees of MTRH**

### **3.3 Study area**

The study was done at Moi Teaching and referral Hospital.

### **3.4 Background of study area**

MTRH is the second National referral hospital in Kenya. The hospital started in 1916 with a bed capacity of 60. Later it served as a District Hospital before attaining referral status in 1998. The Hospital is currently at level six status, and it offers outpatient, inpatient, and specialized healthcare services, with a bed capacity of 1000. It is located in the western part of Kenya and it serves a large Catchment area. The hospital receives referrals from Rift valley, Nyanza and Western regions of Kenya and from as far as South Sudan, and Eastern parts of Uganda, with a catchment population of about 24 million. The hospital hosts the second largest mental unit in Kenya. The unit has two inpatient facilities; one is the general mental wards, while the other is a rehabilitation facility for substance use disorders.

The hospital's rehabilitation unit has a bed capacity of 16 patients and patients are offered rehabilitation services for three months before they are discharged to be followed up at the outpatient rehabilitation clinic that runs once a week. The rehabilitation services are also offered to the hospital's employees through an established Employee assistance program. Usually, the employees with problematic substance use are referred to the Hospital's EAP by their supervisors or colleagues at work. On average, the Rehabilitation unit, which sits next to the mental inpatient unit (Kenya Ward), rehabilitates four to five members of staff yearly from the hospital. Substance related deaths among MTRH employees have been reported in the recent past and this underscores the need for enhanced intervention.

MTRH being a large public institution has a large workforce of about 4,000 employees, drawn from a diverse group of people, and can only be compared to another National facility like Kenyatta National Hospital. The hospital has many departments with different categories of health workers and support staff offering various services. The institution offers support services for various social problems, including substance use disorders and its related problems, to its staff through an Employee Assistance Program (EAP) that is well established and has been in operation for several years.

Moi Teaching and Referral hospital (MTRH), being a national facility at level six, which is the highest level of healthcare delivery in Kenya, with a workforce drawn from all over the country and having a wide variety of hospital departments, is a suitable site for the research since carrying out research on its workforce will give a view representative of hospital setups in Kenya.

### **3.5 Target population**

The target population for the study included all employees of Moi Teaching and Referral Hospital, where an employee of MTRH in this study referred to a member of staff with a personal file number.

### **3.6 Sample size**

One of the main objectives of the study was to determine the prevalence of substance use among employees of MTRH. In a workplace with a population of less than 200 employees, a census is usually recommended where all the employees are interviewed. However, in workplaces with more than 200 employees, sampling is usually recommended to arrive at a reasonable number of respondents to be

interviewed. Further, all the stations in a given workplace should be covered in the sample in a proportionate method (NACADA, 2012). MTRH has a population of more than 200 employees, therefore sampling will be appropriate to determine the number of respondents required to increase validity of the study.

The sample size for this objective was calculated using a sample size formula for estimating a single proportion as described by Fisher, Laing and Strocker (1998) equation as follows:

$$n \geq \left[ \frac{Z_{\alpha/2}}{d} \right]^2 \cdot pq$$

Where:

n = sample size

Z = Z-value corresponding to 95% confidence level (1.96)

$\alpha$  = level of significance (5% or 0.05)

P = prevalence of substance use (alcohol use had the highest prevalence rate) among healthcare workers in a similar study done in Kenya which is 35.8% (Mokaya et. al, 2016). This study was chosen since it was the latest study done on the topic.

d = margin of error

at 5% q = 1-P

Minimum

sample size

Substituting the

above,

$$n \geq \left[ \frac{1.96}{0.05} \right]^2 \times 0.642 \times 0.358 = 354$$

### Adjustment for finite population

Since the population was less than 10,000 the sample size was adjusted as shown below to obtain a finite (n/f) sample size using the following formula:

$$nf = \frac{n}{1 + \frac{n}{N}}$$

$$nf = \frac{354}{1 + \frac{354}{4000}}$$

$$= 326$$

### Adjustment for non-response

In order to achieve a sample size, close to 100%, the sample size was further adjusted for non-response. In the Kenyan study done in 2016, the non-response rate was 12.7% (Mokaya et al., 2016).

Calculated for a non-response rate of 12.7%, the minimum sample size was:

$$\frac{326}{0.873} = 374$$

A minimum of 374 participants were recruited into the study to determine the prevalence of substance use among employees of MTRH.

To determine the sample size for the second objective, on factors associated with substance use the Formula by Peduzzi et al. (1996), used for calculation of samplesize for regression models was used.

$$N = 10K/P$$

Where:

P = prevalence of substance use (alcohol use had the highest prevalence rate) among healthcare workers in a similar study done in Kenya which is 35.8% (Mokaya et. al, 2016).

K = Number of independent variables. Ten independent variables were

tested.N = Sample size

### Minimum

#### sample size

Substituting the

above,  $K =$

$10 \times 10 / 35.8\%$

A minimum of 280 participants were to be recruited to the study to determine the factors associated with substance use.

The sample size calculated for the first objective of 374, being greater than that for associated factors which was 280 was applied since it gave the highest sample size that was suitable for the two objectives.

### **3.7 Sampling procedure**

Multistage sampling was done to determine the respondents. Stratified sampling technique was used to divide the sampling frame into workstation, cadre and sex. A proportionate sample was then calculated for each workstation (Table 1) followed by simple random sampling which was used to select the respondents at the workstations.

**Table 1: The calculated sample sizes of MTRH employees for the workstation stratum.**

ORDER	WORKSTATION	CALCULATED SAMPLE SIZE
1	EMERGENCY DEPARTMENT/HUDUMA CENTRE/FAMILY PLANNING CLINIC	69
2	CONSULTANTS CLINICS/CHANDARIA/AMPATH	22
3	RADIOLOGY AND IMAGING	8
4	ADMINISTRATION	15
5	SURGICAL WARD/RENAL UNIT	62
6	RILEY MOTHER AND BABY HOSPITAL	44
7	MAJALIWA THEATRE	6
8	MEMORIAL AND AMENITY PRIVATE WINGS	23
9	SHOE FOR AFRICA CHILDRENS HOSPITAL	56
10	MENTAL HEALTH UNIT AND ANTI DRUG ABUSE AND REHABILITATION UNIT	14
11	NYAYO WARDS	39
12	LABORATORIES/KITCHENS/MAINTENANCE/TAILORING/LAUNDRY	12
13	MORGUE/WASTE DISPOSAL	4
	TOTAL	374

### **3.8 Eligibility Criteria**

#### **3.8.1 Inclusion criteria**

All employees of MTRH were eligible for the study where an employee of MTRH referred to that member of staff that was employed either on permanent or temporary employment terms.

#### **3.8.2 Exclusion criteria**

Employees who were on any kind of leave (maternity, sick, emergency, study and annual leaves) were excluded from the study since they were not available. Further, all persons who decline consent or were unavailable at their workstations at the time of issuing the questionnaires were excluded from the study.

### **3.9 Data collection methods**

#### **3.9.1 Study instruments**

The WHO ASSIST Questionnaire (Appendix 3) was used to collect information on use of various substances. The tool is used to collect data on substance use and it has been validated for use in African countries (Humeniuk et al., 2010). Although the ASSIST has not been validated in Kenya, validation was done closer home, in Zambia (Kane et al., 2016), and the internal reliability was strong with a Cronbach's alpha of  $\geq 0.80$  for each of the specific substance scales and total substance involvement. Sensitivity and specificity analysis indicated adequate area under the curve across substance types (AUC range: 0.68 – 0.80). The ASSIST was designed to be culturally neutral and useable across a variety of cultures to screen for use of substances (Humeniuk et al., 2010). The tool has been used in Kenya before to collect data on substance use among healthcare workers (Kolongei et al., 2020; Mokaya et al., 2016) and among university students (Ngure et al., 2019).

The WHO developed The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) in 1997 to be faster in administering the existing diagnostic tests for substance use and substance use disorders, to screen for all psychoactive substances, not just alcohol or tobacco to be able to be used in Primary Health Care settings, to have cross cultural relevance and to be able to link easily into a brief intervention. To ensure validity and reliability in international settings, the instrument underwent a three-stage testing (WHO, 2010). In high prevalence settings, The ASSIST is considered an instrument of choice when addressing a range of different psychoactive substances although primarily, it was created to screen drug use. It screens for use of all substance types (tobacco products, alcohol, cannabis, cocaine, amphetamine-type stimulants (ATS), sedatives, hallucinogens, inhalants, opioids and 'other' drugs) and determines a risk score for each substance, where the scores fall into a lower, moderate or high-risk category. The categories determine interventions for the level of substance use. Using the tool to collect data will provide information that can be compared with data from other studies within the same region.

The ASSIST (version 3.1) is a questionnaire with eight questions designed to take about 5-10 minutes to administer. In brief the eight item ASSIST questionnaire asks the following questions:

Question 1 asks about which substances have ever been used in the client's lifetime.

This indicates lifetime use of a substance. Question 2 asks about the frequency of substance use in the past three months, which gives an indication of the substances which are most relevant to current health status.

Question 3 asks about the frequency of experiencing a strong desire or urge to use each substance in the last three months. Question 4 asks about the frequency

of health, social, legal or financial problems related to substance use in the last three months. Question 5 asks about the frequency with which use of each substance has interfered with role responsibilities in the past three months. Question 6 asks if anyone else has ever expressed concern about the client's use of each substance and how recently that occurred. Question 7 asks whether the client has ever tried to cut down or stop use of a substance, and failed in that attempt, and how recently that occurred. Question 8 asks whether the client has ever injected any substance and how recently that occurred.

These questions provide an indication of the level of risk associated with the client's substance use, and whether use is hazardous and likely to be causing harm if use continues. Scoring is done to determine the level of risk by adding scores of questions 2 to 7. Responses to Q8 are not included in calculating specific substance involvement score but injecting is an indicator of risk. Injecting behavior (Q8) is a particularly high-risk activity associated with increased likelihood of overdose, dependence, infection with blood borne viruses such as HIV and hepatitis C and with higher levels of other drug related problems. Scores in the mid-range indicate hazardous or harmful substance use ('moderate risk') and higher scores are likely to indicate substance dependence ('high risk'). Questions associated with 'high risk' use are: compulsion to use (Q3), failed attempts to cut down (Q7) and injecting behavior (Q8).

In this study, the questionnaire was used to determine the lifetime prevalence of substance use and the prevalence of current substance use, with lifetime substance use being any intake of substances at any point in one's life, while current substance

use referred to the taking of substances in the last three months before the data collection. The prevalence of lifetime substance use and the prevalence of current substance use represented the dependent variables.

Data on lifetime substance use was collected using the first question on the ASSIST questionnaire, which asks about history of substance use in the past. Question two of the ASSIST questionnaire was used to generate data on current use of substances since it inquires about substance use in the past three months.

The ASSIST questionnaire was used to ask further questions on substance use which were used to categorize the respondents' substance use into the various risk categories of substance use.

An Additional researcher designed socio-demographic questionnaire (Appendix 2) was used to collect information to satisfy the second objective on associated factors. The questionnaire collected data on age, sex, religion, residence, marital status, highest level of education achieved, cadre, monthly income, work station, substance availability and co-workers' substance use.

### **3.9.2 Study procedure**

After receiving the study approvals, the researcher approached the head of human resource department of MTRH to solicit for a sampling frame. A list of all the staff by gender and cadre, which also represented the department, was obtained from the human resource department. Additional information on staff on leave during data collection period was obtained. Multistage sampling was done, where the sampling frame was stratified into workstations, cadre and sex. A sample size proportionate to cadre and sex, was calculated for each workstation. Simple random sampling

was then done to determine the participants. The selected persons were approached by the researcher, the study explained and consent to participate in the study sort and given through signing a consent form (Appendix 1). Self-administered questionnaires were then given to the consented participants who later dropped the filled questionnaires at identified private collection points within the Hospital, in order to maintain anonymity.

### **3.9.3 Data management and analysis**

Filled in questionnaires were dropped into sealed boxes and picked by the researcher on a daily basis. Data was then keyed into an MS Access database which was password protected. The questionnaires were locked in a drawer and will be kept for five years from the time the study ended. After the period, the questionnaires will be destroyed by shredding. Data was imported into STATA version 14 where coding, cleaning and analysis was done.

Descriptive statistics were used to describe and summarize the characteristics of the sample population. Continuous variables were summarized using means and their corresponding SDs and medians and their corresponding inter-quartile ranges, while categorical variables were summarized using frequencies and percentages. The findings were then presented on tables, charts/graphs and pros.

To calculate lifetime substance use prevalence, the number of those who answered yes in question 1 were divided by the total respondents and multiplied by 100 to get the percentage of lifetime substance use. To calculate current substance use prevalence, a composite binary categorical variable was generated. This variable was generated from questions a – j in question 2 where, a person ticking any other choice

other than never was classified as “yes” (current substance user), while a person ticking all 10 questions (a – j) in question 2 was classified as “no” (not a current substance user). The number of those classified as ‘yes’ (current substance users) was divided by the total respondents to get the prevalence of current substance users.

Specific substance (substances labeled a – j) involvement score was calculated by adding up the scores received for questions 2 through 7 inclusive. The scores were then classified as low risk, moderate risk and high risk for each substance. Proportions for each classification were reported.

The dependent variable was the substance use, which was divided into two; lifetime substance use and current substance use both being binary categorical variables.

Inferential statistics were used to test for association between independent variables and dependent variable. Multivariate analysis utilizing logistic regression was used to establish associations between variables while controlling for confounders. Where at bivariate level Chi Square/Fisher exact test was used to test for association between categorical variables whereas t-test/Wilcoxon rank-sum or ANOVA/Kruskal Wallis test was used to compare mean/median between categories. All tests were carried out at  $\alpha$ -level of significance of 95%. The results were then presented on tables, charts, and pros.

### **3.10 Dissemination of findings**

A copy of the final report will be sent to the CEO of MTRH and the information will be presented to hospital staff in Hospital CMEs. Further, the findings will be published in a reputable journal and will be presented in conferences and in relevant meetings.

### **3.11 Ethical consideration**

The proposal was reviewed and approved by IREC under IREC approval no. FAN: 0003437 (Appendix 6) and a license obtained from NACOSTI under License no. NACOSTI/P/20/5095 (Appendix 8) before the study was conducted to ensure that ethical standards were maintained. Permission was sought from the CEO of MTRH, to allow data collection in the Institution, and a permission letter was obtained (Appendix 7).

The respondent's information was treated with confidentiality. No respondents were required to identify themselves by name and the filled questionnaires were delivered to a private location within the hospital to maintain anonymity and the respondents were reassured of their privacy and confidentiality. An informed consent form was attached to the questionnaire, for signing by the respondents who were willing to participate in the study. The completed questionnaires were kept under lock and key cabinet accessible only to the researcher. Digital data was protected by use of passwords.

## **CHAPTER FOUR**

### **4.0 Results**

This chapter presents the analyzed findings of the study. The data presented includes the socio-demographic information as well as the specific information with respect to the study objectives.

#### **4.1 Socio-demographic Characteristics of MTRH employees**

There was a total of 330 participants included in the Analysis. Table 2 shows their descriptive characteristics. The mean age was 37 years ( $SD=7.8$ ). Majority of the subjects were female 202 (62.4%) and most participants fell in the age category of 30 to 39 years. The respondents were categorized into two groups of clinicians and non-clinicians. The clinician's category comprised of consultants, medical officers, clinical officers and nurses. The other category of non-clinicians comprised all the other cadres of staff. Majority were non clinicians 196 (59.6%) and almost all the participants had attained a tertiary level of education 310 (93.9%). Most of the participants reported that they were married 271 (82.1%) and the median income reported was Ksh.54, 000.00. The median year of experience was 10 years. Slightly more than half of the participants, 170 (52.1%), reported that their co-workers were using substances. Very few reported having any mental illness, 8 (2.4%) and 19 (5.8%) reported that substances were easily available at their workplace.

**Table 2: Socio-demographic characteristics of MTRH employees.**

<b>Variable</b>	<b>N=330 Freq (%)</b>
<b>Sex</b>	
Female	206 (62.4%)
Male	124 (37.6%)
<b>Age (yrs.)</b>	
Count	306
Median	37.000
Q1, Q3	32.00, 42.00
<b>Age in categories</b>	
<=29	46 (15.0%)
30-39	137 (44.8%)
40-49	102 (33.3%)
>=50	21 (6.9%)
<b>Occupation</b>	
Clinician	133 (40.4%)
Non-clinician	196 (59.6%)
<b>Education level</b>	
Secondary	20 (6.1%)
Tertiary	310 (93.9%)
<b>Marital status</b>	
Married	271 (82.1%)
Un-married	59 (17.9%)
<b>Monthly Income</b>	
N	242
Median	54000.000
Q1, Q3	40000.00, 83750.00
<b>Year of work experience</b>	
N	316
Median	10.00
Q1, Q3	5.00, 14.00
<b>Coworker, substance use</b>	
No	156 (47.9%)
Yes	170 (52.1%)
<b>Presence of Mental illness</b>	
No	321 (97.6%)
Yes	8 (2.4%)
<b>Specific Mental Illnesses</b>	
Bipolar	1 (11.1%)
Depression	4 (44.4%)
Dementia	1 (11.1%)
Mild Depression	1 (11.1%)
N/A	1 (11.1%)
Organic psychotic episode	1 (11.1%)
<b>Easy Availability of substances at the workplace</b>	
No	307 (94.2%)
Yes	19 (5.8%)

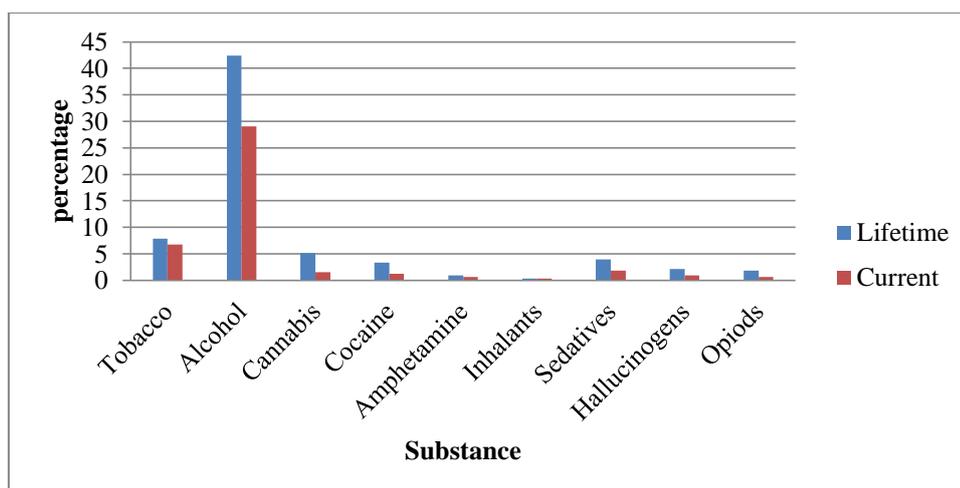
#### 4.2 The prevalence of Substance Use among employees of MTRH

The first objective in this study was to determine the prevalence of substance use among employees of MTRH. The substances used by employees of MTRH are presented on table 2. The lifetime use of alcohol was most prevalent at 42.42%, followed by tobacco, at 7.88%. Lifetime use of cannabis was 5.15%, sedatives 3.94%, cocaine 3.33%, Hallucinogens, 2.12%, opioids 1.82%, Amphetamines 0.91%, inhalant 0.3% and other unlisted substances at 0.3%. In terms of current use of substances, alcohol was the substance with the highest rate of current use at 29.5%, followed by tobacco at 6.73%, sedatives at 1.85%, cannabis at 1.53%, Cocaine at 1.22%, Hallucinogens at 0.92%, Amphetamines, Opioids and other substances each at 0.61% and the least currently used substance was Inhalants at 0.31%.

Table 3 and Figure 2 shows the distribution of substance use rates reported during the study period within the study population.

**Table 3: Prevalence of substance use among employees of MTRH.**

<b>Substance</b>	<b>Lifetime Freq (%)</b>	<b>Current Freq (%)</b>
<b>Tobacco</b>	26 (7.88%)	22 (6.73)
<b>Alcohol</b>	140 (42.42%)	95 (29.05)
<b>Cannabis</b>	17 (5.15%)	5 (1.53)
<b>Cocaine</b>	11 (3.33%)	4 (1.22)
<b>Amphetamine</b>	3 (0.91%)	2 (0.61)
<b>Inhalants</b>	1 (0.3%)	1 (0.31)
<b>Sedatives</b>	13 (3.94%)	6 (1.85)
<b>Hallucinogens</b>	7 (2.12%)	3 (0.92)
<b>Opioids</b>	6 (1.82%)	2 (0.61)
<b>Other</b>	1 (0.3%)	2 (0.61)



**Figure 2: Prevalence of substance use among employees of MTRH**

The study looked at the gender distribution of substance use among the participants and the findings are presented on tables 4a and 4b. Lifetime use was higher among males in all the substances except Cocaine and opioid use which was higher among the females.

**Table 4a: Lifetime Prevalence of substance use among MTRH employees, by gender**

Substance	Female	Male
	Frequency (%)	Frequency (%)
<b>Tobacco</b>	7 (26.9%)	19 (73.1%)
<b>Alcohol</b>	66 (47.1%)	74 (52.9%)
<b>Cannabis</b>	6 (35.3%)	11 (64.7%)
<b>Cocaine</b>	6 (54.5%)	5 (45.5%)
<b>Amphetamine</b>	1 (33.3%)	2 (66.7%)
<b>Inhalants</b>	0 (0.0%)	1 (100.0%)
<b>Sedatives</b>	5 (38.5%)	8 (61.5%)
<b>Hallucinogens</b>	3 (42.9%)	4 (57.1%)
<b>Opioids</b>	4 (66.7%)	2 (33.3%)

**Table 4b: Current Prevalence of substance use among employees of MTRH, by gender and level of risk**

Substance	Female (n=206)			Male (n=124)		
	Low	Moderate	High	Low	Moderate	High
<b>Tobacco</b>	193 (97.0%)	5 (2.5%)	1 (0.5%)	106 (86.9%)	15 (12.3%)	1 (0.8%)
<b>Alcohol</b>	182 (91.0%)	15 (7.5%)	3 (1.5%)	96 (80.0%)	19 (15.8%)	5 (4.2%)
<b>Cannabis</b>	195 (98.5%)	3 (1.5%)	0 (0.0%)	115 (95.8%)	5 (4.2%)	0 (0.0%)
<b>Cocaine</b>	195 (97.5%)	5 (2.5%)	0 (0.0%)	117 (95.9%)	5 (4.1%)	0 (0.0%)
<b>Amphetamine</b>	196 (99.0%)	2 (1.0%)	0 (0.0%)	116 (96.7%)	4 (3.3%)	0 (0.0%)
<b>Inhalants</b>	193 (100.0%)	0 (0.0%)	0 (0.0%)	118 (96.7%)	4 (3.3%)	0 (0.0%)
<b>Sedatives</b>	195 (99.5%)	1 (0.5%)	0 (0.0%)	116 (95.1%)	5 (4.1%)	1 (0.8%)
<b>Hallucinogens</b>	198 (100.0%)	0 (0.0%)	0 (0.0%)	116 (97.5%)	3 (2.5%)	0 (0.0%)
<b>Opioids</b>	198 (99.5%)	1 (0.5%)	0 (0.0%)	119 (98.3%)	2 (1.7%)	0 (0.0%)

Current prevalence was classified by both gender and level of risk. The low-risk category of substance users was the most prevalent for both males and females. Alcohol had a rate of 91% among females and 80 % among the males; tobacco had a prevalence of 97% for females and 86.9% among the males. Inhalants and hallucinogens for females were at a rate of 100% for the low-risk category. Generally, females had a higher rate of persons in the low-risk category compared to males; however, both genders had the majority falling under the low-risk category. The moderate risk category for females had a rate of 7.55% for alcohol, 2.5% for tobacco, 2.5% for cocaine, 1.5% for cannabis, 1% for amphetamines and 0.5 % for sedatives. Hallucinogens and inhalants had a rate of zero. For males, the rate of the low-risk category for alcohol use was 15.8%, tobacco 12.3%, Cannabis 4.2%, cocaine and

sedatives each at 4.1%, Amphetamines and Inhalants both at 3.3% and hallucinogens at 2.5%. Males had a higher number of persons in the moderate risk category compared to females. For the high-risk category, Cannabis, cocaine, amphetamines, inhalants, and Hallucinogens had a zero rate in both males and females. Sedatives in females had a zero rate. Alcohol use among the females had a high-risk category rate of 1.5% while tobacco rate was 0.5%. Among the males, the high-risk category was 4.2% for alcohol, 0.8% for tobacco and 0.8% for sedatives. Injection drug use was reported among two participants with a lifetime prevalence of 0.61% but none reported current use.

#### **4.3 Factors Associated with Substance Use among employees of MTRH**

The last objective in this study was to determine the factors associated with substance use among employees of MTRH. Two most commonly used substances, that is alcohol and tobacco were analyzed separately while the rest of the substances were analyzed under one category of 'other substances' since their rates of use were low. A bivariate analysis, followed by a multivariate analysis was performed to examine the association between the hypothesized risk factors for lifetime and current use for the three categories of substances analyzed in this section. For current substance use, associations were analyzed for the low risk category and for another category that combined the moderate and high risk categories. Table 5 presents the bivariate analysis of the factors associated with lifetime use of the three categories of substances. Tobacco use was significantly associated with sex, cadre, years of work experience, co-worker's use of substances, and substance availability with unadjusted odds ratios of <0.001, 0.022, 0.006, 0.014, and 0.025 respectively. For alcohol use, sex (OR <0.001), marital status (OR 0.034), co-worker's use of substances (OR <0.001) and ease in availability of substances (OR 0.004) were significant. Other

substance use was significantly associated with sex (OR 0.031), age (OR 0.038), and marital status (OR 0.018).

**Table 5: Bivariate analysis of the factors associated with lifetime use of: tobacco, alcohol and other substances among employees of MTRH.**

Variable	Tobacco			Alcohol			Other substance		
	No (N=302)	Yes (N=26)	p value	No (N=188)	Yes (N=140)	p value	No (N=280)	Yes (N=45)	p value
Sex			<0.001 <sup>1</sup>			<0.001 <sup>1</sup>			0.031 <sup>1</sup>
<b>Female</b>	197 (65.2%)	7 (26.9%)		138 (73.4%)	66 (47.1%)		180 (89.6%)	21 (10.4%)	
<b>Male</b>	105 (34.8%)	19 (73.1%)	0.152 <sup>1</sup>	50 (26.6%)	74 (52.9%)	0.710 <sup>1</sup>	100 (80.6%)	24 (19.4%)	0.038 <sup>1</sup>
Age									
<b>Missing</b>	24	0		17	7				
<b>&lt;=29</b>	44 (15.8%)	1 (3.8%)		24 (14.0%)	21 (15.8%)		34 (75.6%)	11 (24.4%)	
<b>&gt;=50</b>	17 (6.1%)	4 (15.4%)		12 (7.0%)	9 (6.8%)		16 (80.0%)	4 (20.0%)	
<b>30-39</b>	124 (44.6%)	12 (46.2%)		73 (42.7%)	63 (47.4%)		113 (83.7%)	22 (16.3%)	
<b>40-49</b>	93 (33.5%)	9 (34.6%)		62 (36.3%)	40 (30.1%)		93 (92.1%)	8 (7.9%)	
Cadre			0.022 <sup>1</sup>			0.140 <sup>1</sup>			1.000 <sup>1</sup>
<b>Missing</b>	1	0		1	0				
<b>Clinician</b>	127 (42.2%)	5 (19.2%)		69 (36.9%)	63 (45.0%)		113 (86.3%)	18 (13.7%)	
<b>non-clinician</b>	174 (57.8%)	21 (80.8%)	0.039 <sup>1</sup>	118 (63.1%)	77 (55.0%)	0.829 <sup>1</sup>	166 (86.0%)	27 (14.0%)	1.000 <sup>1</sup>
Education level									
<b>Secondary</b>	16 (5.3%)	4 (15.4%)		11 (5.9%)	9 (6.4%)		18 (90.0%)	2 (10.0%)	
<b>Tertiary</b>	286 (94.7%)	22 (84.6%)	0.749 <sup>1</sup>	177 (94.1%)	131 (93.6%)	0.034 <sup>1</sup>	262 (85.9%)	43 (14.1%)	0.018 <sup>1</sup>
Marital status									
<b>Married</b>	248 (82.1%)	22 (84.6%)		162 (86.2%)	108 (77.1%)		237 (88.4%)	31 (11.6%)	
<b>Un-married</b>	54 (17.9%)	4 (15.4%)	0.006 <sup>2</sup>	26 (13.8%)	32 (22.9%)	0.169 <sup>2</sup>	43 (75.4%)	14 (24.6%)	0.316 <sup>2</sup>
Years of work experience									
<b>Missing</b>	13	0		10	3		269	43	
<b>Mean (SD)</b>	9.304 (5.851)	12.577 (5.398)		9.975 (5.823)	9.055 (5.927)		10	9	
<b>Range</b>	0.100 - 26.000	2.000 - 23.000		0.100 - 26.000	0.200 - 23.000		5.000, 14.000	5.000, 12.000	
Co-workers'			0.014 <sup>1</sup>			<0.001 <sup>1</sup>			0.264 <sup>1</sup>

---

substance use							
<b>Missing</b>	3	1	3	1			
<b>No</b>	148 (49.5%)	6 (24.0%)	104 (56.2%)	50 (36.0%)		136 (88.3%)	18 (11.7%)
<b>Yes</b>	151 (50.5%)	19 (76.0%)	81 (43.8%)	89 (64.0%)		140 (83.8%)	27 (16.2%)
Easy availability of Substance at the workplace			0.025 <sup>1</sup>			0.004 <sup>1</sup>	0.320 <sup>1</sup>
<b>Missing</b>	3	1	1	3			
<b>No</b>	284 (95.0%)	21 (84.0%)	182 (97.3%)	123 (89.8%)		261 (86.4%)	41 (13.6%)
<b>Yes</b>	15 (5.0%)	4 (16.0%)	5 (2.7%)	14 (10.2%)		15 (78.9%)	4 (21.1%)

---

1= Chi Square test

2= t-test

---

In the multivariate model for lifetime, significant AOR included years of experience (0.004) and co-worker use (0.042) for tobacco; male sex (<0.001), Being un married (0.024), co-worker use of alcohol (<0.001) and availability (0.039) for alcohol use; male sex (0.014) for other substance use. The results for the multivariate model of lifetime use of tobacco, alcohol and other substances are presented on tables 6a, 6b and 6c respectively.

**Table 6a: Multivariate analysis of the factors associated with lifetime tobacco use among MTRH employees**

<b>Characteristic</b>	<b>AOR</b>	<b>95% CI</b>	<b>p-value</b>
<b>Sex</b>			
Female	1		
Male	6.4	2.42, 19.4	<0.001
<b>Cadre</b>			
Clinician	1		
Non-clinician	2.74	0.92, 10.1	0.092
<b>Education Level</b>			
Secondary	1		
Tertiary	0.57	0.15, 2.82	0.4
<b>Years of work experience</b>			
	1.14	1.05, 1.26	0.004
<b>Coworkers' substance use</b>			
No	1		
Yes	3.06	1.11, 10.00	0.042
<b>Easy availability of substances at the workplace</b>			
No	1		
Yes	2.84	0.54, 11.9	0.2

**Table 6b: Multivariate analysis of the factors associated with lifetime alcohol use among MTRH employees**

<b>Characteristic</b>	<b>AOR</b>	<b>95% CI</b>	<b>p-value</b>
<b>Sex</b>			
Female	1		
Male	2.94	1.78, 4.88	<0.001
<b>Cadre</b>			
Clinician	1		
non-clinician	0.72	0.44, 1.20	0.2
<b>Marital status</b>			
Married	1		
Un-married	2.23	1.12, 4.54	0.024
<b>Years of work experience</b>	0.99	0.94, 1.03	0.6
<b>Coworkers' substance use</b>			
No	1		
Yes	2.40	1.46, 3.98	<0.001
<b>Easy availability of substances at the workplace</b>			
No	1		
Yes	3.24	1.12, 10.9	0.039

**Table 6c: Multivariate analysis of the factors associated with lifetime other substance use among employees of MTRH**

<b>Characteristic</b>	<b>AOR</b>	<b>95% CI</b>	<b>p-value</b>
<b>Sex</b>			
Female	1		
Male	2.31	1.19, 4.57	0.014
<b>Age years</b>			
<=29			
>=50	0.95	0.20, 4.03	>0.9
30-39	0.71	0.27, 1.92	0.5
40-49	0.33	0.10, 1.09	0.068
<b>Marital status</b>			
Married	1		
Un-married	1.94	0.78, 4.70	0.14

The study also analyzed the factors associated with moderate and high risk of current use of tobacco, alcohol and other substances, subjecting the results to a bivariate followed by a multivariate analysis. In the bivariate model, the risk of current use of tobacco was significantly associated with sex, and co- worker use, with unadjusted odds ratios of <0.001 and 0.024 respectively. The risk of alcohol use was significantly associated with sex, and coworker use with unadjusted odds ratios of 0.006 and 0.012 respectively. Other substance use risk was significantly associated with marital status (OR 0.035), and years of work experience (OR 0.017). Table 7 shows the bivariate model on the factors associated with the current risk of use of tobacco, alcohol and other substances.

**Table 7: Bivariate analysis of the factors associated with current high and moderate substance risk use of: tobacco, alcohol and other substance among employees of MTRH.**

Variable	Tobacco			Alcohol			Other substance		
	Low (N=302)	Moderate/High (N=26)	p value	Low (N=188)	Moderate /High (N=140)	p value	Low (N=280)	Moderate /High (N=45)	p value
<b>Sex</b>			<0.001 <sup>1</sup>			0.006 <sup>1</sup>			0.118 <sup>1</sup>
<b>Female</b>	193 (97.0%)	6 (3.0%)		182 (91.0%)	18 (9.0%)		169 (94.4%)	10 (5.6%)	
<b>Male</b>	106 (86.9%)	16 (13.1%)		96 (80.0%)	24 (20.0%)		101 (89.4%)	12 (10.6%)	
<b>Age</b>			0.810 <sup>1</sup>			0.844 <sup>1</sup>			0.341 <sup>1</sup>
<b>&lt;=29</b>	42 (95.5%)	2 (4.5%)		40 (88.9%)	5 (11.1%)		34 (85.0%)	6 (15.0%)	
<b>&gt;=50</b>	19 (90.5%)	2 (9.5%)		17 (81.0%)	4 (19.0%)		18 (94.7%)	1 (5.3%)	
<b>30-39</b>	124 (93.2%)	9 (6.8%)		113 (86.3%)	18 (13.7%)		114 (93.4%)	8 (6.6%)	
<b>40-49</b>	91 (91.9%)	8 (8.1%)		86 (86.9%)	13 (13.1%)		84 (93.3%)	6 (6.7%)	
<b>Cadre</b>			0.504 <sup>1</sup>			0.311 <sup>1</sup>			0.501 <sup>1</sup>
<b>Clinician</b>	120 (94.5%)	7 (5.5%)		107 (84.3%)	20 (15.7%)		102 (91.1%)	10 (8.9%)	
<b>non-clinician</b>	178 (92.2%)	15 (7.8%)		170 (88.5%)	22 (11.5%)		167 (93.3%)	12 (6.7%)	
<b>Education level</b>			0.148 <sup>1</sup>			0.725 <sup>1</sup>			1.000 <sup>1</sup>
<b>Secondary</b>	17 (85.0%)	3 (15.0%)		16 (84.2%)	3 (15.8%)		18 (94.7%)	1 (5.3%)	
<b>Tertiary</b>	282 (93.7%)	19 (6.3%)		262 (87.0%)	39 (13.0%)		252 (92.3%)	21 (7.7%)	
<b>Marital status</b>			0.777 <sup>1</sup>			0.080 <sup>1</sup>			0.035 <sup>1</sup>
<b>Married</b>	246 (92.8%)	19 (7.2%)		233 (88.6%)	30 (11.4%)		227 (94.2%)	14 (5.8%)	
<b>Un-married</b>	53 (94.6%)	3 (5.4%)		45 (78.9%)	12 (21.1%)		43 (84.3%)	8 (15.7%)	
<b>Years of experience</b>			0.576 <sup>2</sup>			0.549 <sup>2</sup>			0.017 <sup>2</sup>

<b>Count</b>	286	22	266	41	258	22	
<b>Median</b>	10	10	10	9	10	5.5	
<b>Q1, Q3</b>	5.000, 14.000	5.250, 15.000	5.000, 14.750	6.000, 12.000	6.000, 14.000	1.250, 11.500	
<b>Co-workers' substance use</b>			0.024 <sup>1</sup>		0.012 <sup>1</sup>		0.658 <sup>1</sup>
<b>No</b>	147 (96.7%)	5 (3.3%)	136 (91.9%)	12 (8.1%)	128 (93.4%)	9 (6.6%)	
<b>Yes</b>	149 (90.3%)	16 (9.7%)	138 (82.1%)	30 (17.9%)	138 (91.4%)	13 (8.6%)	
<b>Easy availability of substances at the workplace</b>			0.364 <sup>1</sup>		0.269 <sup>1</sup>		0.350 <sup>1</sup>
<b>No</b>	279 (93.6%)	19 (6.4%)	261 (87.6%)	37 (12.4%)	252 (92.6%)	20 (7.4%)	
<b>Yes</b>	17 (89.5%)	2 (10.5%)	14 (77.8%)	4 (22.2%)	14 (87.5%)	2 (12.5%)	
<b>1= Chi Square test</b>	<b>2= t-test</b>						

On multivariate analysis high/ moderate risk of use of tobacco was significantly associated with male sex (AOR 0.006) and coworker use of the substances (AOR 0.045). High/moderate risk of alcohol use was significantly associated with male sex (AOR 0.006), and coworker use (AOR 0.045). Other substance use risk did not show any significant associations on the multivariate model. The results are presented on tables 8a, 8b and 8c.

**Table 8a: Multivariate analysis of the factors associated with current high and moderate use risk of tobacco among MTRH employees**

<b>Characteristic</b>	<b>AOR</b>	<b>95% CI</b>	<b>p- value</b>
<b>Sex</b>			
Female	1		
Male	4.03	1.56, 11.7	0.006
<b>Education Level</b>			
Secondary	1		
Tertiary	0.47	0.13, 2.25	0.300
<b>Coworkers' substance use</b>			
No	1		
Yes	2.91	1.09, 9.20	0.045

**Table 8b: Multivariate analysis of the factors associated with current high and moderate use risk of alcohol among MTRH employees**

<b>Characteristic</b>	<b>AOR</b>	<b>95% CI</b>	<b>p- value</b>
<b>Sex</b>			
Female	1		
Male	2.38	1.22, 4.69	0.011
<b>Coworkers' substance use</b>			
No	1		
Yes	2.28	1.14, 4.83	0.025

**Table 8c: Multivariate analysis of the factors associated with current high and moderate risk use of other substances among MTRH employees**

<b>Characteristic</b>	<b>AOR</b>	<b>95% CI</b>	<b>p-value</b>
<b>Sex</b>			
Female	1		
Male	2.09	0.85, 5.31	0.110
<b>Marital status</b>			
Married	1		
Un-married	2.49	0.85, 7.01	0.087
<b>Years of work experience</b>	0.92	0.84, 1.01	0.085

## **CHAPTER FIVE: DISCUSSION**

### **5.0 Introduction**

This study provides current data on the prevalence and the factors associated with substance use among employees of MTRH. Few studies done among healthcare workers in Kenya have explored the factors associated with substance use among healthcare workers. The study explored some of the factors that can be influenced through policy and simple interventions like screening and Brief interventions. Screening and Grief Intervention Treatment (SBIRT) are recommended by WHO as part of the Mental health Global Action Plan (MHGAP) (WHO, 2010) for the management of substance use and substance use disorders. Employee Assistance Programs (EAPs), have been shown to be cost-effective in addressing employee issues at the workplace, including substance related problems (Whitelock et al., 2004) and use of Screening, Brief Intervention and Referral to Treatment (SBIRT) provides EAPs with structured avenues to identify employees experiencing problems, including substance related problems and to provide appropriate services (Richmond et al., 2014). The information generated from this study therefore, will be useful to the EAP and to the hospital management in managing substance use among its employees.

### **5.1 Prevalence of substance use among employees of MTRH**

The first objective of the study was to determine the lifetime and the current prevalence of substance use among employees of MTRH. Studies done previously on substance use among healthcare workers in Kenya reported higher rates compared to the general population rates of substance use. This study confirms indeed that there is a high rate of substance use among healthcare workers in Kenya and it is concerning because employee substance use threatens the quality of service

and undermines employee productivity (Frone, 2006). This prevalence data will serve as a useful basis for resource allocation in managing employee substance use and as reference in future research.

In this study alcohol was the most commonly used substance among MTRH employees, with a lifetime prevalence of 42.42% and a current use prevalence of 29.05%. This was followed by tobacco use with a lifetime prevalence of 7.88%, and a current use prevalence of 6.73%. Other substances followed with varied prevalence that were significantly lower than the prevalence for alcohol and tobacco. The results are consistent with findings from other studies done among HCWs in Kenya (Kolongei et al., 2020; Mokaya et al., 2016), where alcohol use is the most prevalent, followed by tobacco use and other substances follow with varied prevalence. In the general population in Kenya alcohol is the most commonly used substance followed by tobacco, marijuana, khat and other substances in that order (NACADA, 2017). Other studies done in other LMIC and in HIC have reported similar findings where alcohol is reported to be the most commonly used substance among healthcare workers and in the general population (WHO, 2020; NACADA, 2019; Okeke et al., 2012). Alcohol and tobacco are non-prohibited substances and therefore their use is legal in Kenya and in many places in the world. This could explain the trend where alcohol and tobacco have been the leading substances used by people all over the world.

The rates of substance use in the study were however higher compared to the rates in the general population, among HCWs and among public servants in Kenya (Kolongei et al., 2020; NACADA, 2017; Morris, 2016; Mokaya et al., 2016; NACADA, 2011).

The general population rates determined by NACADA are findings from respondents of ages 15 to 65 years and this age difference could reduce the prevalence rate in the general population, compared to the prevalence in our study which may seem higher having studied employees of ages above 25 years. Young people included in the general population studies done by NACADA, may not necessarily access alcohol and other substances due to long periods of schooling, lack of finances to access the substances and parental controls.

Although NACADA had reported a declining trend in substance use from 2012 to 2017, a study done during the Covid 19 pandemic which began in 2019, reported a high rate of harmful use of alcohol among healthcare workers in Kenya (Jaguga et al., 2022) and with the high rate of mental illnesses reported in Kenya during the same period (Kwobah et al., 2021), bearing in mind the positive association between mental illnesses and substance use (Richert et al., 2020), the high rate of substance use reported in this study is not surprising. Previous studies done during pandemics reported high stress levels and increase in mental illnesses (Vasilj et al., 2020), and mental illnesses have been associated with substance use for long (Richert et al., 2020). Further, an increase in substance use during the covid 19 pandemic was reported by WHO in 2021 and the UNODC predicted an increase in substance use in sub-Saharan Africa, and warned of an increase in drug trafficking through the region (WHO, 2020; UNODC, 2020). All these factors may contribute to a rise in substance use levels and may therefore explain the high prevalence of substance use reported in this study.

In 2017, NACADA reported that Nairobi and the western parts of Kenya had the highest rates of alcohol use while the eastern and central parts of the country use tobacco more than the other regions (NACADA, 2017). Further the report pointed out that khat (Miraa) was mostly used in the coastal and northeastern parts of Kenya while bhang, also known as cannabis, was mostly used in the coastal and nyanza regions of the country. This study and another done in 2020 (Kolongei et al., 2020) on substance use among HCWs, was carried out in western Kenya while another similar study, carried out in 2016 was carried out in the eastern part of Kenya (Mokaya et al., 2016). The study done in the eastern part of Kenya reported a lifetime prevalence of alcohol use of 35.8% while current use of alcohol was 19.6%. Tobacco had a lifetime prevalence of 23.5% and a current prevalence of 13.2%. The rates for alcohol use were lower, and for tobacco use higher, than the rates reported in the current study. In the study carried out in 2020, on substance use among HCWs in Western Kenya, the lifetime prevalence of alcohol use was estimated to be 33%, tobacco use was 8.9%, Inhalants use was 1.7%, Khat use was 13%, Prescription drug use was 4.7%, Cannabis use was 1.3%, and other drug use was 1.3% (Kolongei et al., 2020). The prevalence of current use in the same study was 15.32% for alcohol, 3.40% for Tobacco and 1.73% for prescription drugs. The rest of the substances had a current use rate of less than 1%. The prevalence of alcohol and tobacco use both currently and in the lifetime were lower in this study compared to our study, but for the other substances, the prevalence varied either marginally or widely, with most rates being higher in our study compared to the one under discussion and this warrants further study.

Another study done in 2016 at MTRH, in western Kenya, by the Employee Assistance Program (EAP) of MTRH (MTRH EAP Survey, 2016), reported a lifetime rate of tobacco use of 33%, 11% for alcohol use and 6% for bhang use, Miraa use rate of 3% and pain killers use rate was 9%. The results for this study were however not published and the study did not use a validated questionnaire. Again, the rates for alcohol, tobacco and bhang use were lower than that reported in our study, and as alluded to earlier at the beginning of the discussion, the higher rates in our study could be explained by the anticipated rise in substance use rates due to the covid 19 pandemic.

In the general population, a 2017 survey carried out by NACADA on Kenyans aged 15-65 showed that 12.2% were currently using alcohol compared to 29.05% in our study, 8.3% were using tobacco compared to 6.73% in our study, 4.1% were using khat/miraa compared to 0.61% in our study and 1.0% were using bhang/cannabis compared to 1.53% in our study. The rates reported in Kenya show a higher prevalence of substance use among healthcare workers compared to the findings from the general population. However, the rates for khat use were lower in our study compared to the rate for the general population and this could be explained by the regional differences in Khat use in the country where higher rates are reported in eastern and northeastern parts of the country, while western regions, in which our study was done report lower rates of khat use. The high rates of substance use reported among HCWs in both HICs (Baldisseri, 2007; Gastfriend, 2005) and LMICs (Kolongi et al., 2020; Mokaya, et al., 2016; Okeke et al., 2012) may imply failure to adhere to a healthy lifestyle by the same professionals who are in charge to

support patients in improving their behavior.

Most studies of healthcare workers' substance use have been conducted in high-income countries and the reported lifetime and current use rates for most substances among HCWs are lower than that of the general population in most HICs (WHO 2010a). This scenario is different in Kenya with HCWS reporting higher rates of substance use compared to that reported by the Kenyan general population (NACADA, 2012; NACADA, 2017; NACADA, 2019; Mokaya, 2016). A similar trend is seen in other countries in sub-Saharan Africa (Moris et al, 2016; Tesfaye et al, 2014; Okeke et al., 2012; Järvinen et al, 2009). This difference could be attributed to difference in socioeconomic and sociocultural characteristics between HICs and LMICs (Wu, 2010).

The pattern of substance use reported among healthcare workers in this study mirrors the pattern seen in the general population in Kenya, where alcohol is the most commonly used substance, followed by tobacco and khat while Cannabis is reported to be the most commonly used Narcotic substance and other substances follow with varied prevalence (Kolongei et al., 2020; Mokaya et al., 2016; NACADA, 2017). This pattern is also seen in WHO reports on general world patterns (Wu, 2010).

Males had the highest rates of use for most of the substances reported both in the lifetime and in current use. These findings were consistent with findings from most studies done on different categories of people in LMIC and in HICs (Atwoli et al. 2011; Kinoti et al., 2011; Mokaya et al., 2016; Othieno et al., 2000; Frank et al., 2007; Frank & Segura, 2009; Underwood & Fox, 2000). On the contrary, the

lifetime prevalence of cocaine and opioid use were high among females compared to males. Studies done on substance use among healthcare workers have reported higher lifetime rates of sedative and opioid use among females (Mokaya, et al., 2016), but cocaine use has not been reported to be higher among females in the studies reviewed by the researchers in this study and this warrants further study. The lower prevalence of substance use among females might be explained by lower peer pressure to use (Borsari & Carey 2006), greater social sanctions for substance use or abuse (Nolen- Hoeksema 2004), and increased susceptibility to negative effects of some substance use in females compared to males (Nolen- Hoeksema 2004). Although female HCWs in the current study and in the other studies carried out in Kenya (Kolongei et al., 2020; Mokaya et al., 2016) reported low levels of substance use compared to that of females in HICs, they reported higher rates of substance use compared to other Kenyan women and women from LMICs (NACADA, 2019; WHO, 2010a; Okeke et al., 2012).

Although in most instances the employees with problematic substance use or the high-risk category of substance users are easily identified for assistance by their supervisors and colleagues, there is evidence suggesting that the low and the moderate risk categories of substance users exert a greater burden on the healthcare system and the economy (WHO, 2010). The ASSIST assesses current risk of substance use and categorizes the risk into low, moderate and high-risk categories using scores. Alcohol had the highest risk of current use among both males and females compared to the other substances and males had the highest risk of current use of alcohol compared to females. Tobacco followed being the only

substance after alcohol with a rate of use in the high-risk category. These findings are consistent with past research findings which report that a higher percentage of the population fall under the low risk and the moderate risk categories and the high-risk category forms a very small percentage of the population (Humeniuk et al. 2010). Similar studies done in Kenya report a similar trend (Kolongei et al., 2020; Mokaya, et al., 2016) although there was only one male reported in the high risk category for tobacco use among healthcare workers in Eastern Kenya. The difference could be attributed to the regional differences in substance use in Kenya reported by NACADA, where tobacco use is reported to be higher in the eastern and north eastern parts of Kenya, while alcohol use is reported to be higher in the western and central parts of Kenya compared to the rest of the country (NACADA, 2017).

Determination of the various risk categories of substance use, being low risk, moderate risk and high risk, is important in ensuring persons are referred to the appropriate intervention strategies, being prevention, treatment and rehabilitation either directly or through Employee Assistance Programs. Studies have shown that the use of substances at any level, including low to moderate risk levels exerts a burden on the health system and the burden may be worse at the low to moderate risk levels compared to the high risk level of use because a higher proportion of the population fall in the low to moderate risk categories as confirmed by our study and other studies done before, while high-risk users might individually experience higher disease burden, but not contribute as much to the global burden due to their smaller number (Humeniuk et al. 2010 ).

The use of substances at any risk level, is particularly concerning, because tobacco, alcohol, and many other substances at any level of risk of use remains associated with health problems of measurable burden both at population, and at individual levels. This study found a high prevalence of the low and moderate risk categories among employees of MTRH and this should be given attention by the MTRH management since studies have shown that the economic burden of substance use by employees in the low and moderate risk categories rests majorly on the employer (Maclellan, 2017). Therefore, routine screening for the most commonly used substances being Alcohol, Tobacco, cannabis and Khat in Kenya, and especially among hospital employees, who are healthcare workers, with determination of the risk category the employee may fall into cannot be overlooked since it is useful in determination of care.

## **5.2 Factors associated with substance use among employees of MTRH**

The last objective in this study looked at the factors associated with substance use among employees of MTRH. Factors associated with alcohol use, Tobacco use and other substance use were tested, both at the bivariate and multivariate levels. Few studies done in LMICs have explored the predictors of substance use among HCWs. Studies done on the use of substances at the healthcare workplace, to determine the factors that occur within the workplace such as workplace culture and acceptance of its use, workplace alienation, the availability, and the existence and enforcement of workplace policies on substance use and social control at work, which have been studied in different work places (Frone, 2003; NACADA, 2012) and have been shown to be the most directly manageable factors through

workplace policy, supervision and education (Frone, 2012) are rare in Kenya and in other LMICs. This study therefore examined individual and environmental predictors of substance use, which are useful in designing intervention programs and in improvement of existing policies.

Lifetime use of alcohol was associated with being male, being unmarried, co-worker use of substances, and substance availability. Cadre and Years of experience were not associated with alcohol use in this study. Michael Frone, extensively studied alcohol use at the work place in the US (Frone, 2010; Frone, 2006; Frone, 2003). He found out that substance availability and coworker use of alcohol were associated with alcohol use at the workplace. The similarity in the findings where both coworker use and substance availability at the workplace were associated with alcohol use is concerning because this may mean that employees at MTRH may be accessing and using substances at the workplace. This underscores the importance of having clearly set institutional policies on substance use, and programs to ensure preventive services are offered in addition to treatment and rehabilitation.

Being male was associated with alcohol use in this study. Similar findings have been reported in other studies among varied populations in the region and in HICs (Frone, 2006; Frone, 2003; Frone, 2010; Atwoli et al., 2011; Kinyanjui & Atwoli, 2013; Tesfaya et al, 2014; Järvinen et al, 2009; NACADA 2019). In China, lifetime alcohol use was associated with being male (Rui et al., 2021). In the US, alcohol use among hospital employees was associated with the use of substances by colleagues at work and substance access at the workplace (Kenna & Lewis, 2008). The same study did not elicit any associations between the use of substances and being male.

Studies done in sub-Saharan Africa on substance use among healthcare workers have reported an association between alcohol use and male sex (Jaguga et al., 2021; Kolongei et al., 2020; Mokaya et al., 2016; Okeke et al., 2012). Moreover, past research among employed adults reveal that men are more likely than women to engage in substance use at work (Newcomb, 1994; Frone, 2003). In addition, WHO reports show that in almost every country, men are more likely to have a substance use disorder than women (WHO, 2018). This might be explained by the fact that in many cultures in Africa, traditional gender roles may prevent substance use for women.

Unmarried health care workers were more likely to report alcohol use compared to the married. Similar findings were reported in Kenya (Jaguga et al., 2022), in Nigeria (Adetunji, 2018) and in China (Rui et al., 2021) where being unmarried was associated with substance use among hospital employees. This is comparable to other studies that have shown a higher prevalence of alcohol use among single or divorced persons (Power et al., 1999). Being unmarried may be associated with social isolation, which is a well-documented risk factor for alcohol use (Jaguga et al., 2021).

Lifetime use of tobacco was significantly associated with being male, co-worker use of substances and years of work experience. Similar findings have been reported in other studies. In Kenya, males had increased odds of using tobacco compared to females in the general population (Ngaruiya et al., 2018). Among healthcare workers in Kenya, being male has been associated with tobacco use (Kolongei et al., 2020; Mokaya et al., 2016). Males were 13 times more likely to smoke than their female

counterparts ( $P < 0.001$ ) in a study done among HCWs in South Africa (Okeke et al., 2012). A systematic review and meta-analysis on tobacco use among HCWs reported an association between male sex and tobacco use (Nilan et al., 2019). Studies have shown that males engage in risky behaviors and because of this, they tend to begin substance use earlier in their lifetime (NIDA, 2022). On the other hand, females are known to be risk averse and this may explain the high likelihood of substance use among males compared to females. Male healthcare workers therefore need support through targeted intervention programs to prevent, treat and rehabilitate this specific risk group.

Peer influence, which in this study was referred to as coworker use of substances, have been associated with tobacco use in studies on tobacco use among healthcare workers (Paul et al., 2010), and the influence is reported to be stronger among men. The use of substances by coworkers or peers makes it more acceptable and when control at the workplace is not adequate, the odds of use are increased (Broman, 2016). These findings emphasize the influence of peer pressure and environment on substance use (Frone, 2012; Strickland & Smith, 2014), and also raises concern about the level of substance use involvement within MTRH.

Years of work experience was associated with tobacco use in this study. The studies done on substance use among healthcare workers in Kenya did not look at years of work experience under factors associated with substance use. However, studies in the general population (NACADA, 2017) and among other groups (Frone, 2003) have reported increasing substance use rates with increasing age. As a person ages, the years of work experience increases and we can therefore assume that the

odds of smoking increase as the years of work experience increase. The increase in substance use with the increase in the years of work experience can be possibly explained by the increase in responsibilities and levels of stress as a person ages because stress is a well-documented predictor of substance use.

Other substance use was associated with being male only. Male gender has been associated with most substance use in this study and in other similar studies as noted above. Traditional gender roles ascribed to women, social stigma and greater societal sanctions may be playing a role in minimizing substance use among females.

Current high and moderate risk of use of tobacco and alcohol were significantly associated with male gender and co-worker use of the two substances both on bivariate and multivariate analysis. Current high and moderate risk use of other substances was significantly associated with years of experience and marital status on bivariate analysis and none of the factors were significant on multivariate analysis. No studies were found that had looked at the association between the risk categories of substance use and the various factors associated with substance use. Many studies have however determined the association between substance use disorders or harmful substance use and the various determinants of substance use. The level of risk associated with the client's substance use, as is described and categorized in the ASSIST questionnaire determines whether use is hazardous and likely to be causing harm (now or in the future) if use continues (WHO, 2010). Scores in the mid-range on the ASSIST are likely to indicate hazardous or harmful substance use ('moderate risk') and higher scores are likely to indicate substance dependence ('high risk'). The moderate and high-risk categories

determined using the ASSIST tool fit in the definition of the category of persons with substance use disorder described in the DSMV (Jeste et al., 2013).

Being male has been associated with having a substance use disorder (Florence, 2017) and harmful alcohol use among healthcare workers in Kenya (Jaguga et al., 2022). A study done in a HIC reported similar findings among physicians, where substance use disorder was associated with being male (Oreskovich et al., 2015).

Peer influence has been associated with substance use disorders among adults (Bountress et al., 2017) which is similar to our study finding. Being male and co-worker use of substances have been mostly associated with the use of substances in this study and in other studies discussed earlier and luckily, these are some of the factors that can be managed directly through workplace policy, supervision and education (Frone, 2012).

### **5.3 Strengths and limitations**

The study had its own strengths and limitations. One strength was the high response rate of 88.2% (330/374) and another was the reported use of substances that are stigmatized (Krill et al., 2016; UNODC, 2018c). Because of the high response rate, and the reports given on use of stigmatized substances, the validity of the study findings is expected to be high. The study was however subject to limitations. Acausal relationship cannot be determined where associations were significant in the study due to limitations inherent in the study design used. Again, Self-reporting which has been shown to introduce social desirability bias (Room, 2005) was a limiting factor. Confidentiality was however maintained and identifiers were omitted to mitigate the effects of the limitation.

## **CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS**

### **6.1 Conclusion**

The study set out to determine the prevalence and factors associated with substance use among employees of MTRH. In this study alcohol and tobacco were the most commonly used substances.

In the lifetime multivariate model, significant associations included years of experience and co-worker use of substances for tobacco; male sex, being un-married, co-worker use of substances, and substance availability for alcohol use; and male sex, for other substance use. The risk of Current use of both tobacco and alcohol were significantly associated with male sex and coworker use of substances. Other substance current use risk did not show any significant associations on the multivariate model. These findings may be generalized to similar hospital setups in Kenya.

### **6.2 Recommendations**

We recommend regular screening of the employees of Moi Teaching and Referral Hospital for alcohol, tobacco and other substance use due to the high rate of substance use reported among MTRH employees in this study.

There is need to sensitize MTRH employees, especially the ones at risk, like male employees, employees whose co-workers' use substances and unmarried employees on substance use and its consequences and therefore interventions targeting these groups are recommended.

We further recommend that control measures, such as strict surveillance be strengthened to ensure that substances are not easily accessible within the workplace at MTRH and to minimize the influence users of substances have on their colleagues at work.

Although this research shows that indeed substance use exists among HCWs, more research is warranted to look further into substance use at the workplace, the level of knowledge on substance use among healthcare workers, and the level of control of substance use at the workplace, especially at MTRH to inform policy and its implementation.

## REFERENCES

- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). <https://doi.org/10.1176/appi.books.9780890425596>
- Attridge, M. (2009). Employee assistance programs: A research-based primer. In C. L. Cooper, J. C. Quick, & M. J. Schabracq (Eds.), *International handbook of work and health psychology* (pp. 383–407). Wiley Blackwell. <https://doi.org/10.1002/9780470682357.ch17>
- Atwoli, L., Munpla, P. A., Ndung'u, M. N., Kinoti, K. C., & Ogot, E. M. (2011). Prevalence of substance use among college students in Eldoret, western Kenya. *BMC Psychiatry*. <https://doi.org/10.1186/1471-244X-11-34>
- Bafunno, D., Catino, A., Lamorgese, V., Longo, V., Montrone, M., Pesola, F., Pizzutilo, P., Petrillo, P., Niccolò Varesano, ·, Zacheo, A., Del Bene, G., Lapadula, V., Mastrandrea, A., Ricci, D., Lauro, A. Di, Cassiano, S., & Galetta, D. (2021). Smoking Prevalence, Knowledge and Perceptions on Tobacco Control Among Healthcare Professionals: A Survey in an Italian Cancer Center. *Journal of Community Health*, *46*, 597–602. <https://doi.org/10.1007/s10900-020-00907-8>
- Baldisseri, M. R. (2007). *Impaired healthcare professional*. *Crit Care Med*. *35*(2). <https://doi.org/10.1097/01.CCM.0000252918.87746.96>
- Biron, M., Bamberger, P. A., & Noyman, T. (2011). Work-Related Risk Factors and Employee Substance Use: Insights From a Sample of Israeli Blue-Collar Workers. *Journal of Occupational Health Psychology*, *16*(2), 247–263. <https://doi.org/10.1037/a0022708>
- Bonevski, B., Regan, T., Paul, C., Baker, A. L., & Bisquera, A. (2014). Associations between alcohol, smoking, socioeconomic status and comorbidities: Evidence from the 45 and Up Study. *Drug and alcohol review*, *33*(2), 169-176. doi: 10.1111/dar.12104.
- Borsari, B., & Carey, K. B. (2006). Influence of the quality of peer relationships on college drinking. *Drug and Alcohol Review*, *25*(4), 361-370. <https://doi.org/10.1080/09595230600741339>.
- Bountress, K., Chassin, L., & Lemery-Chalfant, K. (2017). Parent and peer influences on emerging adult substance use disorder: A genetically informed study. *Development and Psychopathology*, *29*(1), 121–142. <https://doi.org/10.1017/S095457941500125X>
- Broman, C. L. (2016). The Availability of Substances in Adolescence : Influences in Emerging Adulthood The Availability of Substances in Adolescence : In Influences in Emerging Adulthood. *Journal of Child & Adolescent Substance Abuse*, *25*(5), 487–495. <https://doi.org/10.1080/1067828X.2015.1103346>
- Campbell, R., & Langford, R. E. (2014). *Substance abuse in the workplace*. CRC Press, 224. <https://doi.org/10.1201/9781498710695>

- Cherpitel, C. J. (2007). Alcohol and injuries: a review of international emergency room studies since 1995. *Drug and alcohol review*, 26(2), 201-214. <https://doi.org/10.1080/09595230601146686>.
- Cowell, A. J., Bray, J. W., & Hinde, J. M. (2012). The cost of screening and brief intervention in employee assistance programs. *The journal of behavioral health services & research*, 39(1), 55-67.
- Davoli, M., Bargagli, A. M., Perucci, C. A., Schifano, P., Belleudi, V., Hickman, M., ... & VEdeTTE Study Group. (2007). Risk of fatal overdose during and after specialist drug treatment: the VEdeTTE study, a national multi-site prospective cohort study. *Addiction*, 102(12), 1954-1959.
- Dilip Jeste, P. V, Jeffrey Lieberman, P.-E. A., David Fassler, T., Rcxser Peele, S., Speaker Scott Benson, A. R., Akaka, J., Bernstein, C. A., Everett, A. S., Geller, J., Graff, D., Gi, A., Judith Kashtan, eneVMD F., McVoy, M. K., N ininger, J. E., Oldham, J. M., Schatzberg, A. F., lik idge, A. W., & Erik R Vanderlip, P. D. (2012). *Diagnostic and Statistic Manual of Mental Health - V: American Psychiatric Association Board of Trustees*. <https://doi.org/doi.org/10.1176/appi.books.9780890425596.dsm17>
- Dutra, L., Stathopoulou, G., Basden, S. L., Leyro, T. M., Powers, M. B., & Otto, M. W. (2008). A meta-analytic review of psychosocial interventions for substance use disorders. *American Journal of Psychiatry*, 165(2), 179-187.
- EDHS. (2016). Demographic and Health Survey. In *Adolescent Health, Medicine and Therapeutics: Vol. Volume 8*. Central statistical gency (CSA) [Ethiopia] and ICF. <https://doi.org/10.2147/ahmt.s148434>
- Ficarra, M. G., Gualano, M. R., Capizzi, S., Siliquini, R., Liguori, G., Manzoli, L., Briziarelli, L., Parlato, A., Cuccurullo, P., Bucci, R., Piat, S. C., Masanotti, G., De Waure, C., Ricciardi, W., & La Torre, G. (2011). Tobacco use prevalence, knowledge and attitudes among Italian hospital healthcare professionals. *European Journal of Public Health*, 21(1), 29-34. <https://doi.org/10.1093/eurpub/ckq017>
- Frank Erica, Elon Lisa, Naimi Timothy, & Brewer Robert. (2008). Alcohol consumption and alcohol counseling behavior among US medical students: cohort study. *BMJ*, 337-a2155. <https://doi.org/10.1136/bmj.a2155>
- Frank, E. (2007). We physicians preach what we practice, and that matters. *Medscape General Medicine*, 9(4), 59.
- Frank, E., & Breyan, J. (2000). ElonL. *Physician disclosure of healthy personal behaviors improves credibility and ability to motivate*. *Arch FamMed*, 9, 287-90.
- Frank, E., & Segura, C. (2009). Health practices of Canadian physicians. *Canadian Family Physician*, 55(8), 810-811.
- Frone, M. R. (2003). Predictors of Overall and On-the-Job Substance Use Among Young Workers. *Journal of Occupational Health Psychology*, 8(1), 39-54. <https://doi.org/10.1037/1076-8998.8.1.39>

- Frone, M. R. (2012). Workplace substance use climate: Prevalence and distribution in the U.S. workforce. *Journal of Substance Use, 17*(1), 72–83.
- Gastfriend, David. (2005). *Physician Substance Abuse and Recovery: What Does it Mean for Physicians- and Everyone Else?*, JAMA: The Journal of the American Medical Association. 293(12), 1513–1515.10.1001/jama.293.12.1513
- Gebremariam, T. B., Mruts, K. B., & Neway, T. K. (2018). Substance use and associated factors among Debre Berhan University students, Central Ethiopia. *Substance abuse treatment, prevention, and policy, 13*(1), 1-8. <https://doi.org/10.1186/s13011-018-0150-9>.
- Goplerud, E., McPherson, T., & Sharar, D. (2010). Workplace Alcohol Screening, Brief Intervention, and EAPs: What Employers Need to Know. *Health and Policy Productivity Management*. [https://hsrc.himmelfarb.gwu.edu/sphhs\\_policy\\_facpubs/432](https://hsrc.himmelfarb.gwu.edu/sphhs_policy_facpubs/432)
- Humeniuk, R., Henry-Edwards, S., Ali, R., Poznyak, V., Monteiro, M. G., & World Health Organization. (2010). The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST): manual for use in primary care.
- Jack, H., Wagner, R. G., Petersen, I., Thom, R., Newton, C. R., Stein, A., ... & Hofman, K. J. (2014). Closing the mental health treatment gap in South Africa: a review of costs and cost-effectiveness. *Global health action, 7*(1), 23431.
- Jaguga, F., Kwobah, E. K., Mwangi, A., Patel, K., Mwogi, T., Kiptoo, R., & Atwoli, L. (2022). Harmful alcohol use among healthcare workers at the beginning of the COVID-19 pandemic in Kenya. *Frontiers in psychiatry, 157*.
- Jaguga, M. F. (2017). *Substance use disorders among adult in-patients at the mental health unit, Moi Teaching and Referral Hospital, Eldoret, Kenya* (Doctoral dissertation, Moi University).
- Järvinen, M., & Østergaard, J. (2009). Governing adolescent drinking. *Youth & society, 40*(3), 377-402.
- Jeste, D. V. (2013). A fulfilling year of APA presidency: from DSM-5 to positive psychiatry. *American Journal of Psychiatry, 170*(10), 1102-1105.
- Kahuthia-Gathu, Ruth & Okwarah, Patrick & Gakunju, R& Thungu, Jane.. (2013). *Trends and Patterns of Emerging Drugs in Kenya : A Case study in Mombasa and Nairobi Counties*. *Journal of Applied Biostatistics*. 67.5308.10.4314/jab.v67i0.95055.
- Kane, J. C., Murray, L. K., Bass, J. K., Johnson, R. M., & Bolton, P. (2016). Validation of a substance and alcohol use assessment instrument among orphans and vulnerable children in Zambia using Audio Computer Assisted Self-Interviewing (ACASI). *Drug and alcohol dependence, 166*, 85-92.
- Kenna, G. A., & Lewis, D. C. (2008). *Substance Abuse Treatment , Prevention , and Policy Risk factors for alcohol and other drug use by healthcare professionals*. 8, 1–8. <https://doi.org/10.1186/1747-597X-3-Received>

- Kinoti, K. E., Jason, L. A., & Harper, G. W. (2011). Determinants of alcohol, khat, and bhang use in rural Kenya. *African journal of drug and alcohol studies*, *10*(2).
- Kinyanjui, D. W. C., & Atwoli, L. (2013). Substance use among inmates at the Eldoret prison in Western Kenya. *BMC Psychiatry*. <https://doi.org/10.1186/1471-244X-13-53>
- Kolongi K. Titus, O.S., O. J., & Albert, G. G. (2020). February, 2020 1. *Research Square*, 1–21.
- Krill, P. R., Johnson, R., & Albert, L. (2016). The Prevalence of Substance Use and Other Mental Health Concerns among American Attorneys. *Journal of Addiction Medicine*, *10*(1), 46–52. <https://doi.org/10.1097/ADM.0000000000000182>
- Kross, E., & Ayduk, O. (2017). Self-distancing: Theory, research, and current directions. In *Advances in experimental social psychology* (Vol. 55, pp. 81-136). Academic Press.
- Kwobah, E. K., Mwangi, A., Patel, K., Mwogi, T., Kiptoo, R., & Atwoli, L. (2021). Mental Disorders Among Health Care Workers at the Early Phase of COVID-19 Pandemic in Kenya; Findings of an Online Descriptive Survey. *Frontiers in Psychiatry*, *12*(July), 1–11. <https://doi.org/10.3389/fpsyt.2021.665611>
- Lai, J., Ma, S., Wang, Y., Cai, Z., Hu, J., Wei, N., ... & Hu, S. (2020). Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. *JAMA network open*, *3*(3), e203976-e203976.
- Lo, T. Q., Oeltmann, J. E., Odhiambo, F. O., Beynon, C., Pevzner, E., Cain, K. P., Laserson, K. F., & Phillips-Howard, P. A. (2013). Alcohol use, drunkenness and tobacco smoking in rural western Kenya. *Tropical Medicine and International Health*, *18*(4), 506–515. <https://doi.org/10.1111/tmi.12066>
- McLellan, A. T. (2017). *SUBSTANCE MISUSE AND SUBSTANCE USE DISORDERS: Why do they matter in healthcare?* *Trans Am Climatol Assoc.* *128*, 112–130. PMID: 28790493; PMC 5525418
- McPherson, T. L., Goplerud, E., Derr, D., Mickenberg, J., & Courtemanche, S. (2010). Telephonic screening and brief intervention for alcohol misuse among workers contacting the employee assistance program: A feasibility study. *Drug and Alcohol Review*, *29*(6), 641-646.
- Midford, R. (2005). Australia and alcohol: living down the legend. *Addiction*, *100*(7), 891-896. <https://doi.org/10.1111/j.1360-0443.2005.01155.x>
- Mokaya, A. G., Mutiso, V., Musau, A., Tele, A., Kombe, Y., Ng'ang'a, Z., Frank, E., Ndeti, D. M., & Clair, V. (2016). Substance Use among a Sample of Healthcare Workers in Kenya: A Cross-Sectional Study. *Journal of Psychoactive Drugs*. <https://doi.org/10.1080/02791072.2016.1211352>
- MTRH Employee Assistance Program (EAP) survey report, 2016.

- Muzi, G., Crespi, E., Madeo, G., Monaco, A., Curradi, F., Diodati, R., & Abbritti, G. (2001). Smoking in the workplace. Study at a hospital in central Italy. *La Medicina del lavoro*, 92(1), 54-60.
- NACADA. (2011). “ *Alcohol and Drug Abuse Situation Analysis among Employees in the Public Sector Institutions in Kenya* ” *Alcohol and Drug Abuse Situation among Employees in the Public Sector*. AJADA Journal. Volume 1. ajada.go.ke
- NACADA. (2012). *RAPID SITUATION ASSESSMENT OF THE STATUS OF DRUG AND SUBSTANCE ABUSE ii*. AJADA Journal. Volume 1. ajada.go.ke
- NACADA. (2016). “ *NATIONAL SURVEY ON ALCOHOL AND DRUG ABUSE AMONG SECONDARY SCHOOL STUDENTS IN KENYA* .”AJADA Journal, volume 1. ajada.go.ke
- NACADA. (2017). *RAPID SITUATION ASSESSMENT OF DRUGS AND SUBSTANCE ABUSE IN KENYA*. AJADA Journal, volume 1. ajada.go.ke
- Ngaruiya, C., Abubakar, H., Kiptui, D., Kendagor, A., Ntakuka, M. W., Nyakundi, P., & Gathecha, G. (2018). Tobacco use and its determinants in the 2015 Kenya WHO STEPS survey. *BMC Public Health*, 18(Suppl 3), 14–16.  
<https://doi.org/10.1186/s12889-018-6058-5>
- Nilan, K., McKeever, T. M., McNeill, A., Raw, M., & Murray, R. L. (2019). Prevalence of tobacco use in healthcare workers: A systematic review and meta-analysis. *PLoS ONE*, 14(7).  
<https://doi.org/10.1097/00001504-200105000-00006>
- O'Donovan, D. (2001). Substance misuse by doctors, nurses and other healthcare workers. *Current Opinion in Psychiatry*, 14(3), 195–199.  
<https://doi.org/10.1097/00001504-200105000-00006>
- Oberg, E. B., & Frank, E. (2009). Physicians' health practices strongly influence patient health practices. *The journal of the Royal College of Physicians of Edinburgh*, 39(4), 290.
- Okeke, P., Ross, A., Esterhuizen, T., & Van Wyk, J. (2012). Tobacco and alcohol use among healthcare workers in three public hospitals in KwaZulu-Natal, South Africa. *South African Family Practice*, 54(1), 61–67.  
<https://doi.org/10.1080/20786204.2012.10874177>
- Oreskovich, M. R., Shanafelt, T., Dyrbye, L. N., Tan, L., Sotile, W., Satele, D., West, C. P., Sloan, J., & Boone, S. (2015). The prevalence of substance use disorders in American physicians. *American Journal on Addictions*, 24(1), 30–38.  
<https://doi.org/10.1111/ajad.12173>
- Othieno, C. J., Kathuku, D. M., & Ndeti, D. M. (2000). Substance abuse in outpatients attending rural and urban health centres in Kenya. *East African medical journal*, 77(11).
- Otieno, A., & Ofulla, A. (2009). Drug abuse in Kisumu town western Kenya. *African Journal of Food, Agriculture, Nutrition and Development*.  
<https://doi.org/10.4314/ajfand.v9i3.43010>

- Paul, C. L., Ross, S., Bryant, J., Hill, W., Bonevski, B., & Keevy, N. (2010). The social context of smoking: A qualitative study comparing smokers of high versus low socioeconomic position. *BMC Public Health, 10*.  
<https://doi.org/10.1186/1471-2458-10-211>
- Peduzzi, P., Concato J., Kemper, E., Holford (TR, Feinstein AR. (1996). A simulation study of the number of events per variable in logistic regression analysis. *J Chin Epidemiol, 49(12): 1373-9*. doi: 10.1016/s0895-4356(96)00236-3.
- Piderit, S. K. (2000). Rethinking resistance and recognizing ambivalence: A multidimensional view of attitudes toward an organizational change. *Academy of management review, 25(4), 783-794*.
- Power, C., Rodgers, B., & Hope, S. (1999). Heavy alcohol consumption and marital status: disentangling the relationship in a national study of young adults. *Addiction, 94(10), 1477–1487*. <https://doi.org/10.1046/j.1360-0443.1999.941014774.x>
- Preti, E. et all.(2020). The Psychological Impact of Epidemic and Pandemic Outbreaks on Healthcare Workers: Rapid Review of the Evidence. *Current Psychiatry Reports, 22(8)*.
- Proietti, L., Bonanno, G., Di Maria, A., Palermo, F., Polosa, R., & Lupo, L. (2006). Smoking habits in health care workers: experience in two general hospitals of Eastern Sicily. *La Clinica Terapeutica, 157(5), 407-412*.
- Richert, T., Anderberg, M., & Dahlberg, M. (2020). Mental health problems among young people in substance abuse treatment in Sweden. *Substance Abuse: Treatment, Prevention, and Policy, 15(1), 1–10*. <https://doi.org/10.1186/s13011-020-00282-6>
- Richmond, M. K., Shepherd, J. L., Fred, C., Lcsw, R. C. W., Reimann, B., & Mph, L. F. (2014). *Journal of Workplace Behavioral Health Associations Between Substance Use , Depression , and Work Outcomes : An Evaluation Study of Screening and Brief Intervention in a Large Employee Assistance Program. October, 37–41*. <https://doi.org/10.1080/15555240.2014.866470>
- Roman, P. M. (1982). Barriers to the use of constructive confrontation with employed alcoholics. *Journal of drug issues, 12(4), 369-382*.
- Solberg, L. I., Maciosek, M. V., & Edwards, N. M. (2008). Primary care intervention to reduce alcohol misuse: ranking its health impact and cost effectiveness. *American journal of preventive medicine, 34(2), 143-152*.
- Sorsdahl, K., Stein, D. J., & Myers, B. (2012). Negative attributions towards people with substance use disorders in South Africa: Variation across substances and by gender. *BMC Psychiatry, 12(1), 101*. <https://doi.org/10.1186/1471-244X-12-101>
- Stead, L. F., Perera, R., Bullen, C., Mant, D., Hartmann-Boyce, J., Cahill, K., & Lancaster, T. (2012). Nicotine replacement therapy for smoking cessation. *Cochrane database of systematic reviews, (11)*.

- Strickland, J. C., & Smith, M. A. (2014). The effects of social contact on drug use: Behavioral mechanisms controlling drug intake. *Experimental and Clinical Psychopharmacology*, 22(1), 23–34. <https://doi.org/10.1037/a0034669>
- Stuart Gregory, P. L. (2000). Recent developments in populations at risk for substance abuse. *Cuttrrent Opinion in Psychiatry*, 13, 315–320. [https://www.researchgate.net/publication/232111725\\_Recent\\_developments\\_in\\_populations\\_at\\_risk\\_for\\_substance\\_abuse](https://www.researchgate.net/publication/232111725_Recent_developments_in_populations_at_risk_for_substance_abuse)
- Tesfaye, G., Derese, A., & Hambisa, M. T. (2014). Substance use and associated factors among university students in Ethiopia: a cross-sectional study. *Journal of addiction*, 2014.
- Thomas, V. S., & Rockwood, K. J. (2001). Alcohol abuse, cognitive impairment, and mortality among older people. *Journal of the American Geriatrics Society*, 49(4), 415-420.
- Thompson, J. C., Kao, T. C., & Thomas, R. J. (2005). The relationship between alcohol use and risk-taking sexual behaviors in a large behavioral study. *Preventive medicine*, 41(1), 247-252.
- Trice, H. M., & Sonnenstuhl, W. J. (1988). Drinking behavior and risk factors related to the work place: Implications for research and prevention. *Journal of Applied Behavioral Science*, 24(4), 327–346.
- Trice, H. M., & Sonnenstuhl, W. J. (1990). On the construction of drinking norms in work organizations. *Journal of studies on Alcohol*, 51(3), 201-220.
- Underwood, B., Hackshaw, A., & Fox, K. (2007). Smoking, alcohol and drug use among vocational dental practitioners in 2000 and 2005. *British dental journal*, 203(12), 701-705.
- United Nations. (2018). WOMEN AND DRUGS: drug use, drug supply and their consequences. In *United Nations publication, Sales No. E.18.XI.9* (Vol. 5). <https://www.unodc.org/wdr2018>
- United Nations. (2015). *Transforming Our World: The 2030 Agenda for Sustainable Development*. New York: UN Publishing. <https://repositorio.cepal.org>.
- UNODC. (2018a). Analysis of drug markets. In *World Drug Report 2018*. <https://doi.org/10.18356/dc023cb1-en>
- UNODC. (2018b). Executive summary — Conclusions and policy implications. In *World Drug Report 2018*. <https://doi.org/10.18356/a1062695-en>
- UNODC. (2018c). Global overview of drug demand and supply. In *World Drug Report 2017*. <https://doi.org/10.18356/bdc264f4-en>
- UNODOC. (2012). *United Nations Office on Drugs and Crime. Global Study on Homicide: Trends, Context, Data*. <https://doi.org/10.1002/yd.20002>

- Vasilj, I., Herceg, K., Covic, I., Santi, M., Curlin, M., Ljevak, I., Bosnjak, A., Sarac, Z., Kiseljakovi, E., & Babic, R. (2020). Determinants of the covid-19 pandemic in the west herzegovina canton. *Psychiatria Danubina*, 32(7), 221–225. <https://doi.org/10.1001/jamanetworkopen.2020.14053>
- Vohs, K. D., & Baumeister, R. F. (Eds.). (2016). *Handbook of self-regulation: Research, theory, and applications*. Guilford Publications.
- Voltmer, E., Frank, E., & Spahn, C. (2013). Personal health practices and patient counseling of German physicians in private practice. *International Scholarly Research Notices*, 2013.
- Whiteford, H., Ferrari, A., & Degenhardt, L. (2016). Global Burden Of Disease Studies: Implications For Mental And Substance Use Disorders. *Health Affairs*, 35(6), 1114–1120. <https://doi.org/10.1377/hlthaff.2016.0082>
- Whitlock, E. P. (2004). US Preventive Services Task Force. Behavioral counselling interventions in primary care to reduce risky/harmful alcohol use by adults: a summary of the evidence for the US Preventive Services Task Force. *Ann. Inter. Med.*, 140, 557-568.
- WHO. (2010). *The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST)*. <https://www.sahealth.sa.gov.au/wps/wcm/connect>
- WHO. (2013). The world health report 2013: Research for universal health coverage. *World Health Organization Press*, 146. <https://doi.org/10.1126/scitranslmed.3006971>
- WHO. (2018). *Global status report on alcohol and health 2018*. [https://doi.org/doi.org/entity/substance\\_abuse/publications/global\\_alcohol\\_report/en/index.html](https://doi.org/doi.org/entity/substance_abuse/publications/global_alcohol_report/en/index.html)
- Woldia, N. W. (2019). *Prevalence of Substance Use and Associated Factors Among Preparatory*. 3(2), 25–33.
- World Health Organization. (2014). *Global Status Report On Noncommunicable Diseases 2014*.
- World Health Organization. (2018). Global status report on alcohol and health 2018: executive summary. *World Health Organization*.
- World Health Organization. (2019). WHO report on the global tobacco epidemic, 2019. In *Geneva: World Health Organization*. <http://www.who.int/tobacco/mpower/offer/en/>
- Wu, L.-T. (2010). Substance abuse and rehabilitation: responding to the global burden of diseases attributable to substance abuse. *Substance Abuse and Rehabilitation*, 5. <https://doi.org/10.2147/sar.s14898>

## APPENDICES

### Appendix 1: Consent Form

#### Part 1: Study information sheet

#### RE: Research study on substance use among employees of MTRH

**Dear Sir/ Madam,**

You are being asked to take part in research on substance use and its associated factors, among employees of MTRH. I am kindly asking you to take part because you are an employee of MTRH. Please read the form carefully and ask any questions you may have before agreeing to take part in the study.

The aim of the study is to determine the prevalence of substance use and its associated factors among employees of MTRH. You must be working at the facility to participate in the study.

If you agree to take part in the study, you will answer the questionnaires attached to this consent form. There are two sections of the self-administered questionnaire interview. The first part asks about your socio-demographic data which will be useful in establishing associated factors. The second part is a WHO standardized questionnaire on the use of various substances. The interview will take about 10 to 20 minutes to complete. You will be required to seal the filled questionnaire and then deposit it at a sealed parcel box which will be located at your exit from the hospital.

There is the risk that you may find some of the questions to be sensitive for example questions on your salary and on your substance use. Kindly note that your information will remain confidential and will not be linked to you by any means. All your filled up questionnaires will be locked up in lockable cabinets accessible only to the researcher. There will be no payments or tokens given to you for participating in the study, however, your participation will be highly appreciated since you will have contributed to the body of knowledge on substance use among healthcare workers.

Taking part in this study is completely voluntary. You may skip any questions that you do not want to answer. You are also free to withdraw from the study at any time. However, you are encouraged to participate and complete all the questions.

The researcher conducting the study is Dr. Eunice Chepkoech Temet, a Masters student in Psychiatry. The research is a thesis project for the fulfilment of the requirement for the award of the master's degree. The research is self-sponsored.

In case of any questions or clarifications, you can contact the researcher through the following contacts:

E-mail address: [eunicetemet@gmail.com](mailto:eunicetemet@gmail.com)

Mobile Phone number: 0723649310

Sincerely,

Dr. Eunice Chepkoech Temet

Registrar, Moi University, School of Medicine.

## **Part 2: STATEMENT OF CONSENT**

I have read and understood the information provided in the information sheet concerning the research. The information regarding the nature of the study is adequate and I understand what is required of me. I am also aware of my right to withdraw at any point in the course of the study without consequences.

I therefore consent to participate in this study

Name.....

Signature.....

Date.....

## Appendix 2: Individual and Environmental associated factors' Questionnaire

1. Serial number .....
2. Age: .....
3. Sex  
 Male  female  her (specify).....
4. Occupation/Cadre (i.e. Nurse, Consultant Pediatrician, Security officer, Morgue attendant etc.)  
 .....
5. Religion  
 Christian  Muslim  her (specify).....
6. Marital status  
 Married  
 Un-Married (single, divorced, separated, widowed)
7. Residential estate (State your current estate/village of residence within Eldoret town and its surrounding areas)  
 .....
8. Highest level of education achieved  
 None  
 Primary  
 Secondary  
 Tertiary (College, University, Polytechnic)
9. Monthly income (Net income from the sum of net salary and other sources of income) in Kenyan Shillings.  
 .....

## 10. Work Station

.....

## 11. How long have you worked for MTRH? (State the duration you have worked for MTRH in years)

.....

## 12. Do any of your co-workers use substances?

Yes

No

## 13. Have you ever suffered from any form of mental illness?

Yes

No

## 14. If you answered yes to question 13, specify the illness.

.....

## 15. Are substances easily available in your workstation? (Where Availability refers to the degree to which a substance like alcohol or bhang or any other substance is present at a defined area for the population living in that area at the moment of need.)

Yes

No

## 16. If your answer to the above question was yes, indicate below the substance(s) easily available to you and to your co-workers at your workstation.

.....

### Appendix 3: ASSIST Questionnaire

#### QUESTION 1

In your life, which of the following substances have you ever used? ( <i>NON-MEDICAL USE ONLY</i> )	Yes	No
a. Tobacco products (cigarettes, chewing tobacco, cigars, etc.)	0	3
b. Alcoholic beverages (beer, wine, spirits, etc.)	0	3
c. Cannabis (marijuana, pot, grass, hash, etc.)	0	3
d. Cocaine (coke, crack, etc.)	0	3
e. Amphetamine type stimulants (speed, diet pills, ecstasy, etc.)	0	3
f. Inhalants (nitrous, glue, petrol, paint thinner, etc.)	0	3
g. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)	0	3
h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)	0	3
i. Opioids (heroin, morphine, methadone, codeine, etc.)	0	3
j. Other - specify:	0	3

## QUESTION 2

In the past three months, how often have you used the substances you mentioned ( <i>FIRST DRUG, SECOND DRUG, ETC</i> )?)	Never	Once or Twice	Monthly	weekly	Daily or almost daily
a. Tobacco products (cigarettes, chewing tobacco, cigars, etc.)	0	2	3	4	5
b. Alcoholic beverages (beer, wine, spirits, etc.)	0	2	3	4	5
c. Cannabis (marijuana, pot, grass, hash, etc.)	0	2	3	4	5
d. Cocaine (coke, crack, etc.)	0	2	3	4	5
e. Amphetamine type stimulants (speed, diet pills, ecstasy, etc.)	0	2	3	4	5
f. Inhalants (nitrous, glue, petrol, paint thinner, etc.)	0	2	3	4	5
g. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)	0	2	3	4	5
h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)	0	2	3	4	5
i. Opioids (heroin, morphine, methadone, codeine, etc.)	0	2	3	4	5
j. Other - specify:	0	2	3	4	5

**QUESTION 3**

During the past three months, how often have you had a strong desire or urge to use ( <i>FIRST DRUG, SECOND DRUG, ETC</i> )?	Never	Once or twice	monthly	weekly	Daily or almost daily
a. Tobacco products (cigarettes, chewing tobacco, cigars, etc.)	0	3	3	4	5
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, diet pills, ecstasy, etc.)	0	3	4	5	6
f. Inhalants (nitrous, glue, petrol, paint thinner, etc.)	0	3	4	5	6
g. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)	0	3	4	5	6
h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)	0	3	4	5	6
i. Opioids (heroin, morphine, methadone, 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 ( <i>FIRST DRUG, SECOND DRUG, ETC</i> ) 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
d. Cocaine (coke, crack, etc.)	0	4	5	6	7
e. Amphetamine type stimulants (speed, diet pills, 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 (Valium, Serepax, Rohypnol, etc.)	0	4	5	6	7
h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)	0	4	5	6	7
i. Opioids (heroin, morphine, methadone, 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 ( <i>FIRST DRUG, SECOND DRUG, ETC</i> )?	Never	Once or Twice	Monthly	Weekly	Daily or Almost Daily
a. Tobacco products (cigarettes, chewing tobacco, cigars, etc.)	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, diet pills, 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 (Valium, Serepax, Rohypnol, etc.)	0	5	6	7	8
h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)	0	5	6	7	8
i. Opioids (heroin, morphine, methadone, codeine, etc.)	0	5	6	7	8
j. Other - specify:	0	5	6	7	8

**QUESTION 6**

Has a friend or relative or anyone else ever expressed concern about your use of <i>(FIRST DRUG, SECOND DRUG, ETC.)?</i>	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, diet pills, ecstasy, etc.)	0	6	3
f. Inhalants (nitrous, glue, petrol, paint thinner, etc.)	0	6	3
g. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)	0	6	3
h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)	0	6	3
i. Opioids (heroin, morphine, methadone, codeine, etc.)	0	6	3
j. Other - specify:	0	6	3

**QUESTION 7**

Have you ever tried and failed to control, cut down or stop using <i>(FIRST DRUG, SECOND DRUG, ETC.)?</i>	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, diet pills, ecstasy, etc.)	0	6	3
f. Inhalants (nitrous, glue, petrol, paint thinner, etc.)	0	6	3
g. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)	0	6	3
h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)	0	6	3
i. Opioids (heroin, morphine, methadone, codeine, etc.)	0	6	3
j. Other - specify:	0	6	3

**QUESTION 8**

	No, Never	Yes, in the past 3 months	Yes, but not in the past 3 months
Have you ever used any drug by injection? <i>(NON-MEDICAL USE ONLY)</i>	0	2	1

**Appendix 4: Budget**

<b>ITEM</b>	<b>COST</b>
Stationery.....	30,000.00
Data analysis .....	50,000.00
Token for assistants .....	20,000.00
Lockable drawer cabinets.....	20,000.00
Five Wooden sealed parcel boxes.....	25,000.00
Contingency .....	50,000.00
<b>Total.....</b>	<b>195,000.00</b>

**Appendix 5: Time Schedule**

<b>MONTH</b>	<b>ACTIVITY</b>
<b>January 2020</b>	Questionnaire distribution
<b>February 2020</b>	Questionnaire distribution
<b>March 2020</b>	Collection of questionnaires
<b>April 2020</b>	Collection of questionnaires
<b>May 2020</b>	Data analysis
<b>June 2020</b>	Data analysis and reporting

## Appendix 6: IREC Approval



MOI TEACHING AND REFERRAL HOSPITAL  
P.O. BOX 3  
ELDORET  
Tel: 334711/2/3

Reference: IREC/2019/180  
**Approval Number: 0003437**

Dr. Temet Chepkoech Eunice,  
Moi University,  
School of Medicine,  
P.O. Box 4606-30100,  
**ELDORET-KENYA.**



MOI UNIVERSITY  
COLLEGE OF HEALTH SCIENCES  
P.O. BOX 4606  
ELDORET  
Tel: 334711/2/3  
10<sup>th</sup> September, 2019



Dear Dr. Temet,

**SUBSTANCE USE AMONG EMPLOYEES OF MOI TEACHING AND REFERRAL HOSPITAL**

This is to inform you that **MU/MTRH-IREC** has reviewed and approved your above research proposal. Your application approval number is **FAN:0003437**. The approval period is **10<sup>th</sup> September, 2019 – 9<sup>th</sup> September, 2020**.

This approval is subject to compliance with the following requirements;

- i. Only approved documents including (informed consents, study instruments, MTA) will be used.
- ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by **MU/MTRH-IREC**.
- iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to **MU/MTRH-IREC** within 72 hours of notification.
- iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to **MU/MTRH-IREC** within 72 hours.
- v. Clearance for export of biological specimens must be obtained from relevant institutions.
- vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
- vii. Submission of an executive summary report within 90 days upon completion of the study to **MU/MTRH-IREC**.

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) <https://oris.nacosti.go.ke> and also obtain other clearances needed.

Sincerely,

**DR. S. NYABERA**  
**DEPUTY-CHAIRMAN**

**INSTITUTIONAL RESEARCH AND ETHICS COMMITTEE**

cc	CEO	-	MTRH	Dean	-	SOP	Dean	-	SOM
	Principal	-	CHS	Dean	-	SON	Dean	-	SOD

## Appendix 7: Hospital Approval



An ISO 9001:2015 Certified Hospital



# MOI TEACHING AND REFERRAL HOSPITAL

Telephone : (+254)053-2033471/2/3/4  
 Mobile: 722-201277/0722-209795/0734-600461/0734-683361  
 Fax: 053-2061749  
 Email: [ceo@mtrh.go.ke](mailto:ceo@mtrh.go.ke)/[directorsoffice@mtrh@gmail.com](mailto:directorsoffice@mtrh@gmail.com)

Nandi Road  
 P.O. Box 3 – 30100  
 ELDORET, KENYA

Ref: ELD/MTRH/R&P/10/2/V.2/2010

11<sup>th</sup> September, 2019

Dr. Temet Chepkoech Eunice,  
 Moi University,  
 School of Medicine,  
 P.O. Box 4606-30100,  
ELDORET-KENYA.

### APPROVAL TO CONDUCT RESEARCH AT MTRH

Upon obtaining approval from the Institutional Research and Ethics Committee (IREC) to conduct your research proposal titled:-

***"Substance Use among Employees of Moi Teaching and Referral Hospital".***

You are hereby permitted to commence your investigation at Moi Teaching and Referral Hospital.

*Dr. Wilson K. Aruasa*  
**DR. WILSON K. ARUASA, MBS**  
**CHIEF EXECUTIVE OFFICER**  
**MOI TEACHING AND REFERRAL HOSPITAL**

cc - Senior Director, (CS)  
 - Director of Nursing Services (DNS)  
 - HOD, HRISM

*All correspondence should be addressed to the Chief Executive Officer*

*Visit our Website: [www.mtrh.go.ke](http://www.mtrh.go.ke)*

**TO BE THE LEADING MULTI-SPECIALTY HOSPITAL FOR HEALTHCARE, TRAINING AND RESEARCH IN AFRICA**

**Appendix 8: NACOSTI Approval**

 REPUBLIC OF KENYA	 NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION
Ref No: <b>463350</b>	Date of Issue: <b>28/May/2020</b>
<b>RESEARCH LICENSE</b>	
	
<p><b>This is to Certify that Dr. EUNICE Chepkoech TEMET of Moi University, has been licensed to conduct research in Uasin-Gishu on the topic: SUBSTANCE USE AMONG EMPLOYEES OF MOI TEACHING AND REFERRAL HOSPITAL for the period ending : 28/May/2021.</b></p>	
License No: <b>NACOSTI/P/20/5095</b>	
<b>463350</b> Applicant Identification Number	 Director General NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION
	Verification QR Code 
<p>NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.</p>	

## THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013

The Grant of Research Licenses is Guided by the Science, Technology and Innovation (Research Licensing) Regulations, 2014

## CONDITIONS

1. The License is valid for the proposed research, location and specified period
2. The License any rights thereunder are non-transferable
3. The Licensee shall inform the relevant County Director of Education, County Commissioner and County Governor before commencement of the research
4. Excavation, filming and collection of specimens are subject to further necessary clearance from relevant Government Agencies
5. The License does not give authority to transfer research materials
6. NACOSTI may monitor and evaluate the licensed research project
7. The Licensee shall submit one hard copy and upload a soft copy of their final report (thesis) within one of completion of the research
8. NACOSTI reserves the right to modify the conditions of the License including cancellation without prior notice

National Commission for Science, Technology and Innovation  
off Waiyaki Way, Upper Kabete,  
P. O. Box 30623, 00100 Nairobi, KENYA  
Land line: 020 4007000, 020 2241349, 020 3310571, 020 8001077  
Mobile: 0713 788 787 / 0735 404 245  
E-mail: [dg@nacosti.go.ke](mailto:dg@nacosti.go.ke) / [registry@nacosti.go.ke](mailto:registry@nacosti.go.ke)  
Website: [www.nacosti.go.ke](http://www.nacosti.go.ke)