

**ASSOCIATION BETWEEN SUBSTANCE ABUSE  
AND HIV/STI RISKY SEXUAL RELATED  
BEHAVIORS AMONG STUDENTS IN SELECTED  
PUBLIC UNIVERSITIES, KENYA.**

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**Association between substance abuse and HIV/STI risky sexual related  
behaviors among students in selected Public Universities, Kenya.**

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**A Thesis submitted in partial fulfilment for the Degree of Doctor of  
Philosophy in Epidemiology in the Jomo Kenyatta University of  
Agriculture and Technology**

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## DECLARATION

This Thesis is my original work and has not been presented for a degree in any other University.

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## **DEDICATION**

This Thesis has been dedicated to my wife Stella and my sons Victor, Edwin, Bernard and members of my family for their love, understanding and support during the study process. Without their love, exemplary attitude towards life and intellectual spirit I would not have been able to maintain the level of enthusiasm and motivation necessary to complete this academic journey. I am greatly indebted to them who in various ways, their insightful comments, continuous support, patience, motivation, enthusiasm and encouragement led to this final product. My heartiest thanks to my wife who was a solid pillar of support as she encouraged me as I left home tolerating a virtue of absenteeism. The joy and enthusiasm she had for my research was contagious and motivational for me, even during tough times in life.

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## LIST OF ABBREVIATIONS AND ACRONYMS

<b>AAU</b>	Association of African Universities	,
<b>ACU</b>	Association of Commonwealth Universities	
<b>ADEA</b>	Association for the Development of Education in Africa	
<b>AIDS</b>	Acquired Immune Deficiency Syndrome	
<b>AOR</b>	Adjusted Odds Ratio	
<b>CDC</b>	Center for Disease Control and Prevention	
<b>CHE</b>	Commission for Higher Education	
<b>CI</b>	Confidence Interval	
<b>FGD</b>	Focused Group Discussion	
<b>GOK</b>	Government of Kenya	
<b>HEAIDS</b>	Higher Education HIV/AIDS Programme	
<b>HIV</b>	Human Immunodeficiency Virus	
<b>IDUs</b>	Intravenous Drug Users	
<b>ITROMID</b>	Institute of Tropical Medicine and Infectious Diseases	
<b>JKUAT</b>	Jomo Kenyatta University of Agriculture and Technology	
<b>KEMRI</b>	Kenya Medical Research Institute	
<b>KU</b>	Kenyatta University	
<b>MDGs</b>	Millennium Development Goals	

<b>MOH</b>	Ministry of Health
<b>MSM</b>	Men who have Sex with Men
<b>NAC</b>	National AIDS Council
<b>NACADA</b>	National Authority for Campaign against Alcohol and Drug Abuse
<b>NACC</b>	National AIDS Control Council
<b>NASCOP</b>	National Aids and Sexually Transmitted Control Programme
<b>NACOSTI</b>	National Commission for Science Technology and Innovation
<b>NIAAA</b>	National Institute on Alcohol Abuse and Alcoholism
<b>NGOs</b>	Non-Governmental Organizations
<b>OR</b>	Odds Ratio
<b>OTC</b>	Over The Counter
<b>PAI</b>	Population Action International
<b>PPS</b>	Probability Proportionate to Size
<b>SA</b>	South Africa
<b>SADC</b>	Southern Africa Development Conference
<b>SD</b>	Standard Deviation
<b>SPSS</b>	Statistical Package for Social Science
<b>SSA</b>	Sub-Saharan Africa



<b>SSC</b>	Scientific Steering Committee
<b>SSQ</b>	Semi-Structured Questionnaires
<b>STI</b>	Sexually Transmitted Infections
<b>UK</b>	United Kingdom
<b>UNAIDS</b>	United Nations Programme on HIV/AIDS
<b>UNDCP</b>	United Nations International Drug Control Program
<b>UNICEF</b>	United Nations Children's Fund
<b>UNPF</b>	United Nations Population Fund
<b>UNODC</b>	United Nations Office on Drugs and Crime
<b>USA</b>	United States of America
<b>WHO</b>	World Health Organization

## OPERATIONAL DEFINITIONS

**Substance abuse;** is a pattern in which the user consumes the substance in amounts or with methods which are harmful to themselves or others.

**Risky sexual behavior;** is a behavior that increases one's risk of contracting HIV/STI and includes sex at an early age, multiple sexual partners and unprotected sexual behaviors.

**Club drugs;** are synthetic substances used by teenagers and young adults at bars, nightclubs, concerts and parties.

**Oral sex;** it's the sex that involves using the mouth, lips, tongue and teeth to stimulate a sexual partner's genitals.

## **ABSTRACT**

The study was conducted to explore substance abuse among youth in respect to their association on risky sexual related behavior. The study was conducted among 4<sup>th</sup> year university students in Kenya where substance abuse is reported to be a serious concern, prevalent on many campuses and ingrained on university campuses worldwide. The general objective was to determine the association between substance abuse and HIV/ STI risky sexual related behaviors among students in selected Kenyan Public Universities. The study adopted an exploratory cross sectional study design where data collection was done by both qualitative and quantitative methods. The data was collected by use of Semi Structured Questionnaires (SSQ), Focus Group Discussions (FGDs) and Key Informant Interviews (KII). The data were analyzed to determine relationships among self-reported substance abuse, Human Immunodeficiency Virus (HIV), Sexual Transmitted Infections (STI), risky sexual related behaviors. Further multivariate and bivariate analysis was done to establish association between dependent and independent variables. The youth sampled were 2880 consisting of 54.1% male and 45.9% female, the mean age was 24 years with a range of 21–32 years. The reduced risk of substance abuse was significantly associated with accommodation in hostels compared to rented apartment. The respondents who had both parents were less likely to abuse substance by 0.67 times compared to those having only a father or none of the parents having an increased risk of substance abuse by 1.92 and

1.39 times respectively compared to those who had the mother as the parent. The female respondents were less likely to abuse substances by 0.77 times. The increased number of occupants in the house significantly decreased risk of substance abuse by 0.70 times. The respondents who received information from peers/friends, media and others abused substances by 1.38, 1.40 and 4.40 times respectively while receipt of information from church was less likely to contribute to substance abuse. The respondents who reported not having visualized posters on STI/HIV, abused substances by 1.43 times more than those who had. The respondents who were involved in receptive vaginal intercourse were significantly more likely to abuse substances (AOR 2.10; 95% CI 1.53 – 2.88;  $P < 0.001$ ) but insignificant association between those who had none penetrative sex  $P > 0.05$ . With lecturers as the reference group, students who abused substances were significantly likely to have sex with a fellow student or others (strangers)  $P > 0.05$  and  $P = 0.017$  respectively. The prevalence of condom use among the university students was approximately 82%. The respondents who reported condoms safety from pregnancy were significantly less likely to abuse substances than those who did not  $P < 0.001$ . The students who reported that partner never trusted them were significantly less likely to abuse substances  $P < 0.001$ . The respondents who reported untrustworthy among partners were significantly less likely to abuse substances  $P < 0.001$ . The respondents who consumed over 3 beers over the weekend were significantly  $P < 0.001$  likely to report substance abuse compared to those who consumed 1-2 drinks. This study noted that majority of respondents were aged between 21 – 32 years with the overall rates of sexual experience consistent among genders

in all the universities and rented private accommodation though some resided in the university halls. At Kenyatta University (KU) and Narok a small proportion resided in accredited hostel. There was a decrease in alcohol consumption among respondents and drinking rates were high in dormitories and residence halls with a consumption of 3-6 drinks over the weekend. The respondents who had both parents alive were less likely to abuse substance with a high prevalence of perceived risks motivated by substance abuse and alcohol with receptive vaginal sex being preferred though there was easy availability of condoms and availability of information. All the universities had HIV preventive activities but the HIV Policy document was available at JKUAT and KU unlike Maseno university, Narok and Kimathi Colleges.

University students should be targeted as high risk groups in the transition of HIV/STI and substance abuse through funding policies, frameworks and university administrators, staff and students. The university administration, parents and residential owners need to create intervention bonds against substance abuse and risky sexual behaviours. Availability of intervention information should be enhanced through a longitudinal study on condom use to establish the factors contributing to substance abuse and HIV /STI.

## **CHAPTER ONE:**

### **1.0 INTRODUCTION**

#### **1.1 Background information**

Education is touted as pivotal to the achievement of several of the millennium Development Goals (MDGs), which includes reduction in HIV/STI infections. The Association of African Universities (AAU) revealed that, education sector is a country's learner's strongest weapon to equip them with informed choices (AAU, 2007).

Information indicates that a significant number of the new HIV infections occur among the youth who are significantly involved in substance abuse as well as risky sexual behavior (UNAIDS, 2007). It is estimated that 70% of new HIV cases and 83% of AIDS deaths occur in Africa (UNICEF, 2010). In the Sub-Saharan Africa (SSA), youth aged 15-24 years account for 45% of new HIV infections and sexual contact account for 80-90% of all infections (UNODC, 2007; UNAIDS, 2008).

The student relationships on substance abuse and HIV/STI at Universities influence interactions (AAU, 2007) and this threatens the educational systems.

The higher education institutions are potential breeding ground for substance abuse and HIV/STI due to the close proximity of a large number of youth at their peak years of sexual activity and experimentation devoid of supervision (Saint *et al.*, 2004). In a study in South Africa (S.A) the HIV/STI prevalence was of 8.2% among 4<sup>th</sup> year students (Rispel *et al.*, 2006). The substance abuse and HIV/STI is a challenge to the youth who are the foundation of a society and define the pace of nation's development. It is thus important to understand the risky sexual behavior forces that interlink and influence universities' education in Kenya, hence this study. This need to be explored as unavailability of condoms, cultural and social norms is associated with HIV/STI risks among the youth.

Many youth abuse substances for experimentation that compromise their judgment and increase their engagement in risky sex. This research anticipated university student's substance abuse would be associated to risky sexual behaviors, as measured by lower levels of condom use. The youth are left to find their own way in a difficult and ever changing society on sexual behaviors matters.

According to the South Africa review, the HIV prevalence rate among youth aged 15–24 years and 20–24 years was 10.3% and 15.2% respectively (UNAIDS 2010). The National AIDs and STI Control Program (NASCOP) revealed 2.2 million Kenyans to be infected with HIV/AIDS and over 60% of new infections occur among people aged 15-35 years that represent 38% of the Kenya's population (NASCOP, 2005). The students at the +universities are within 19–24 years and majority have first unplanned sexual experience due to misinformation at the universities (Pettiforet *et al.*, 2009).

The majority of university research focuses on risky sexual practices ignoring substance abuse that remains a major problem. Many students use tobacco, alcohol, khat (miraa), chang'aa (illicit liquor), marijuana (bhangi), mnazi (traditional brew), glue, heroin and 'brown sugar', to maintain their social identities and shape risky sexual behaviors. There is demand coordination from the universities to mainstream the formulation of policies, plans, programs and activities which effectively address the epidemic concerns. The HIV/AIDS Control Unit is one of the major interventions to the pandemic.

The universities are not fully committed in substance abuse and HIV/STI response. The S.A Universities have been proactive in the first nationwide survey of HIV/AIDS in universities which determined an HIV prevalence of 3.4% (HEAIDS Report, 2010).

The study addressed various theories and models as a prerequisite for formulating a practical and workable framework. The unique perspective of this study focused on areas that are often neglected in HIV research, such as Institutional settings in which sexual partnerships and socio networks. The study established the association between substance abuse and HIV/STI risky sexual related behaviors. The investigation considered the weaknesses and strengths of the common models and theories that are used in the

formulation of policies, strategies, elicit the gaps. This was very instrumental in the design and development of substance abuse and HIV/STI prevention frameworks in the Kenya government sector through ACU, NACADA, Ministry of Higher Education and other ministries.

## **1.2 Statement of the problem**

There is dearth of information in the magnitude of the substance abuse and HIV/AIDS in the universities due to inadequate mainstreaming activities (UON HIV/AIDS Policy, 2003). There is turmoil as youth matures, engages with peers and the influence of their family diminishes as they relate to increasing prevalence of substance abuse.

There has been weaker collaborative links between University authorities and the Kenyan Government. Little is known about HIV/STI status on African universities and there is an HIV conspiracy of silence at universities as students conduct themselves as if the disease did not exist.

There is a belief that university students are not a high risk population hence the need of the study at JKUAT, KU, Maseno, Narok and Kimathi. There is a complex relationship between higher education level, substance abuse and HIV/STI risks that require to be explored further by use of relevant theoretical models.

The limited published data has led to youth being sidelined by substance abuse and HIV/STI prevention efforts. More focus is needed to generate data through relevant forums such as ACU and government Ministries. The Kenyan youth grow up in a society where opportunity has been eroded by institutional collapse with insufficient data from which recommendations can be developed. The few interventions are based on generic models of 'youth sexual behavior' and do not take into account the many ways that university students' experiences are different from those of other youth.



### **1.3 Justification**

Kenyans below 30 years constitute 75% of the population, forming the largest human resource for national development. The universities are the centers of academic excellence and cream of skilled manpower yet threatened by increase of substance abuse and HIV risks (UON HIV/AIDs policy, 2003). The selected universities JKUAT, KU, Maseno, Narok and Kimathi can offer a catalytic role by providing technical support to halt the spread.

The unlimited freedom, curiosity, experimentation on substances and their invulnerability of HIV/STI perceptions make the study to rise to the occasion by “challenging the challenger” (substance abuse and HIV/STI). In Kenya, there are limited qualitative researches done using theoretical models. There are few studies that produce insufficient, un-published and delinked data. The findings from this study suggest practical, interventions and innovative strategies to policy makers.

### **1.4 Research Questions**

1. What is the prevalence and types of substance abuse among students in selected Kenyan Public Universities?
2. What are the HIV/STI risky sexual behaviors among students in selected Kenyan Public Universities in 2012?
3. What is the association between substance abuse and HIV/STI risky sexual behaviors among students in selected Kenyan Public Universities ?

### **1.5 Objectives**

#### **1.5.1 General objective**

To assess substance abuse and HIV/STI risky sexual related behaviors among students in selected Kenyan Public Universities.

### **1.5.2 Specific objectives**

1. To determine the prevalence and types of substance abuse among students in selected Kenyan Public Universities in 2012.
2. To establish HIV/STI risky sexual behaviors among students in selected Kenyan Public Universities in 2012.
3. To determine the association between substance abuse and HIV/STI risky sexual behaviors among students in selected Kenyan Public Universities in 2012.

### **1.6 Conceptual Framework**

This study conceptualized youth's sexual behavior as being learnt during social interactions hence the influence on interaction between the youth and social structures. Through social interactions in the institutions of learning norms, values and beliefs are passed and youths' identities are formed. To understand substance abuse and risky sexual behaviors in Kenyan universities where social identities are influential in youth's behaviors, the conceptual framework of this study drew upon various theories.

The theories helped and explained the researcher's understanding of university's influence on youth sexual behaviors and role of substance abuse and the link between the theories was elaborated. Some of the models were not initially designed for HIV/AIDS and some were not adapted to fit in with HIV/AIDS risks (Kalichman *et al.*, 2006). Even though some of these models addressed some relevant issues in HIV/ AIDS risk reduction, it appeared as if one of their greatest weaknesses was the factors upon which they were built and might not have been based on any one psychological theory (Morrison and Bennett, 2006).

The students could develop a sense of non-belonging and feel uncomfortable at the university and be excluded from the university's social and organizational culture (Case,

2008; Levin *et al.*, 2006). The alienation could stem from peers, groupings and student`s low self-concept culture, race, neighborhood and residence (Esplen *et al.*, 2009).

The new environment caused individual's conflict and straddled on whether to follow old or new university life and students engaged in substance abuse (Oldfield, 2007). This method of assessing substance abuse and HIV/AIDS risk does not involve the actual testing of participants for HIV hence vigorous understanding of the theoretical frameworks was crucial.

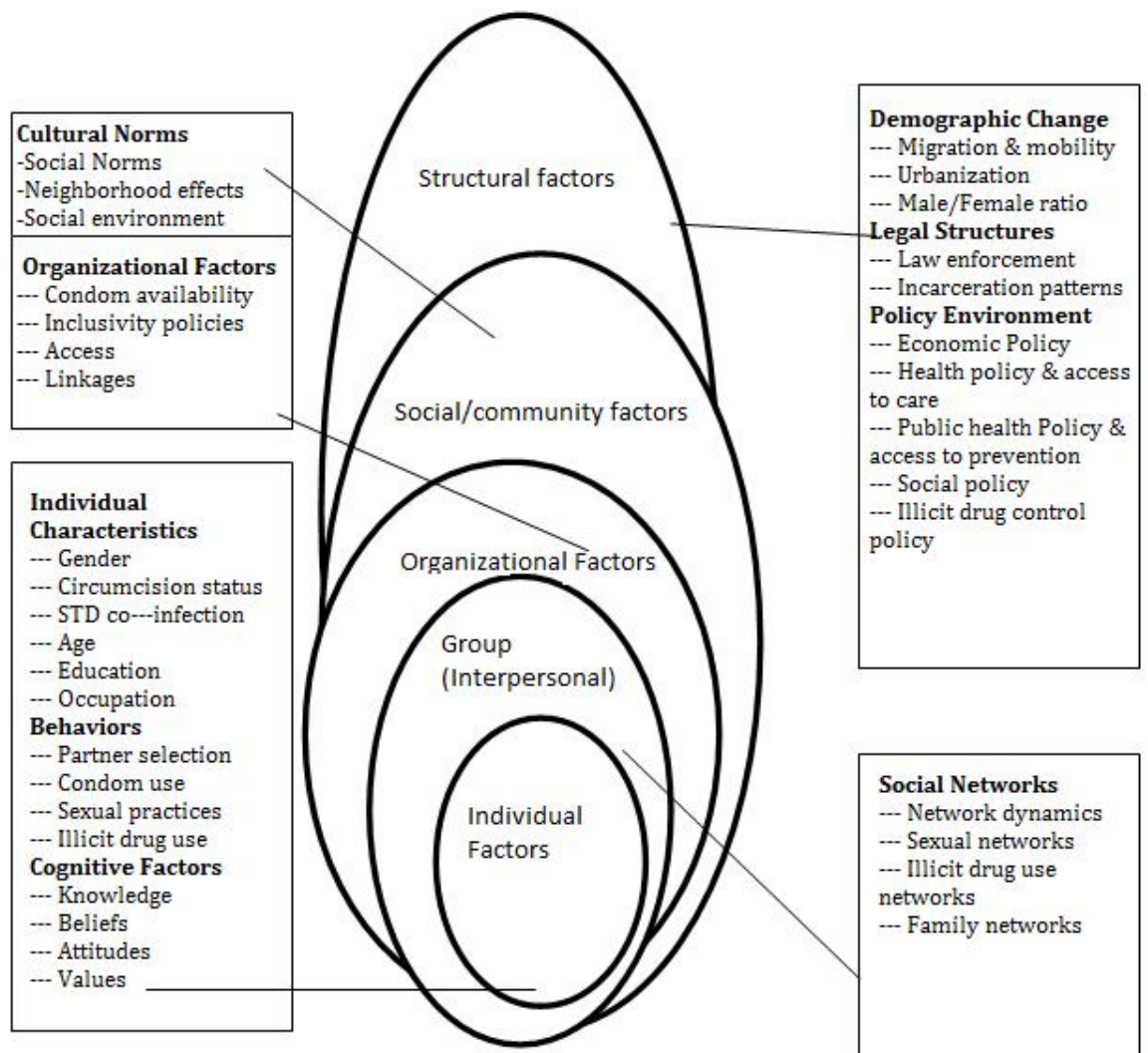


Figure 1.1 A framework on interrelationship between substance abuse and HIV/STI risky behaviors

## **CHAPTER TWO:**

### **2.0 LITERATURE REVIEW**

The University education is a form of symbolic capital where most students are expected to emerge with necessary skills. Many people still consider Universities to be a learning place and modernity where students are inscribed with values, careers and lifestyles. Both society and students expect Universities to be transformative academically and socially. However they also offer an entry into the adult world of sex. The universities are regarded as transition in contrast to school students who are seen as immature (Pace, 2004). The university can be described as a 'romance and marriage market place', where intimate relationships for many students occurs.

The motives for sexual activity among university students are economic security, prestige by dating desirable male students, sexual gratification and stress relief. Many universities have highly permissive nature that offers some of the best conditions for the suspension of everyday norms in relation to student's conduct of sexuality. There is consensus in the literature on university students in Africa and elsewhere that these institutions offered opportunities for sexual relations.

Thus, universities have been reported as a transition stage for students (Pace, 2004). The living arrangements in most residential Kenyan campuses offer sexual relations due to few restrictions on the entertainment of members of the opposite sex in students' rooms. Students allow guests in their rooms any time and their sexual partners sleep over night though this is against University regulations. The student's roommates sleep with their sexual partners overnight. The sexual practices at the universities occur at any time and in any secluded places.

The university student's sexual practices have implications to substance abuse and HIV/AIDS due to the proximity of breeding grounds with minimal supervision (Saint *et al.*, 2004).

At the Universities there is limited condom use due to unplanned sexual encounter while majority experience condom breakage and spillage. The information, education, communication, condom promotion are some of the strategies used in reduction of high-risk sexual behavior. The higher education alone does not necessarily change high-risk behavior for people must also be empowered with the necessary skills and knowledge.

## **2.1 Substance abuse**

There is need to quickly find measures to deal with substance abuse to protect the life of many especially the youth (UNODC, 2007). UNODC revealed that, substance abuse is an integral part of youth culture and has become a global phenomenon to Western and industrialized nations (UNODC, 2007).

Findings from an American study indicated that the commonly abused substances as amphetamines, cocaine, heroine, marijuana, amphetamine injections, inhalants, stimulants, prescription medications and hallucinogens( Ballas, 2006).

The liberal sex without asking about HIV status was common among those who abused substances (Peltzer *et al.*, 2009). In Cape Town, lifetime use of marijuana was associated with higher odds of lifetime sexual intercourse (Palen *et al.*, 2006). The substance abuse was associated with increased HIV/STI related risks, unfavorable condom attitudes and lower skills.

Furthermore, alcohol use is associated with sexual initiation and abuse of multiple substances. The moving to riskier levels of substance abuse was associated with initiation of risky sexual behaviors, may be that both types of behavior were driven by similar factors or each served to promote the other (Tang, 2002). The accessibility and availability of these substances differ.

In the United Kingdom (UK) substance use among students and experimentation was considered normal (Larimer *et al.*, 2005). It is believed that substance use lowers inhibitions, increase sexual desires but increases the risks of HIV/STI. Furthermore, substance use reduces the likelihood of student's condom use during a sexual act and marijuana use was associated with an increased number of sexual partners.

The youth groups who abuse drugs differ. In South Africa 20 years was the onset age of heroin abuse but one third of Intravenous Drug Users (IDUs) in Kenya and Tanzania were below 25 years as compared to 2% in Nigeria where 2.4% of tertiary students were injected with heroin (Parry and Pithey, 2006; Ross *et al.*, 2008).

The data on HIV prevalence in Mauritius, Nigeria, S.A, Tanzania and Kenya were limited and revealed association between substance abuse and HIV/STI (Beckerleg, 2004; McCurdy, 2005). In Kenya, the most commonly abused substances were alcohol, tobacco, bhang (marijuana), glue, miraa (khat) and psychotropic drugs (NACADA, 2004).

Findings from a study in Kenya indicated that substance availability influenced sexual risky behaviors where heroin use was associated with sex (Beckerleg, 2004). In Kenya one third of IDUs are below 25 years and 27.6% reported passing their needle to someone else the previous year (Beckerleg, 2004). The needle sharing for 1–3 days among sex partners was common among female IDUs in Mombasa as well as hiding syringes for re use to avoid being stolen by another user (Beckerleg, 2004).

The effects of substance abuse in Kenya include risky sexual behavior practices that lead to increased exposure to HIV/AIDS (Stimsons *et al.*, 2006).

The Kenyan media have influenced youth's knowledge and attitudes on substance abuse. The ease of access and communication of Nairobi, as a transit point by drug traffickers for cocaine, heroin and mandrax find their way into the local market. The university students' experiences, interpersonal and societal demands put them at risk of substance abuse (Larimer *et al.*, 2005).

The Kenyan universities report high rates of substance use among students with alcohol use and tobacco use being more prevalent. It is essential to monitor the situation closely by frequent prevalence surveys in Kenyan universities.

### **2.1.1 Alcohol consumption**

Across the world it has been reported that university students' aged 18-24 years have higher alcohol consumption levels than that of their non-university peers (Karam *et al.*, 2003). Furthermore, heavy drinking of four or more drinks occurred in one occasion among female university students (Dantzer *et al.*, 2006).

Globally, males have been reported to begin to drink alcohol later than girls and their alcohol consumption increases with age. In addition, women had greater alcohol related risk of un-protected sex with steady but not casual partners (LaBrie *et al.*, 2011).

An estimated 31% of 8 million college students aged 18-24 years in the United States of America (USA) abused alcohol with drinking, casual partner and sexual behavior associated with an increased risk for unprotected sex (Ferreira *et al.*, 2006). In this regard, the undergraduates reported penetrative sexual intercourse as drinking increased the likelihood of a high-risk partner (Stinson, 2010).

The students are exposed to alcohol advertisements and establishments which sell alcohol with perceptions that alcohol is for social success (Abbey *et al.*, 2007; NIAA, 2008). In addition, drinking occurs in the dormitories and residence halls with students who reside in apartments drinking less than commuting students.

The students aged 18-24 years had unprotected sex before having sex with reported drinking of 4-5 drinks in a single drinking occasion (Hingson *et al.*, 2005).

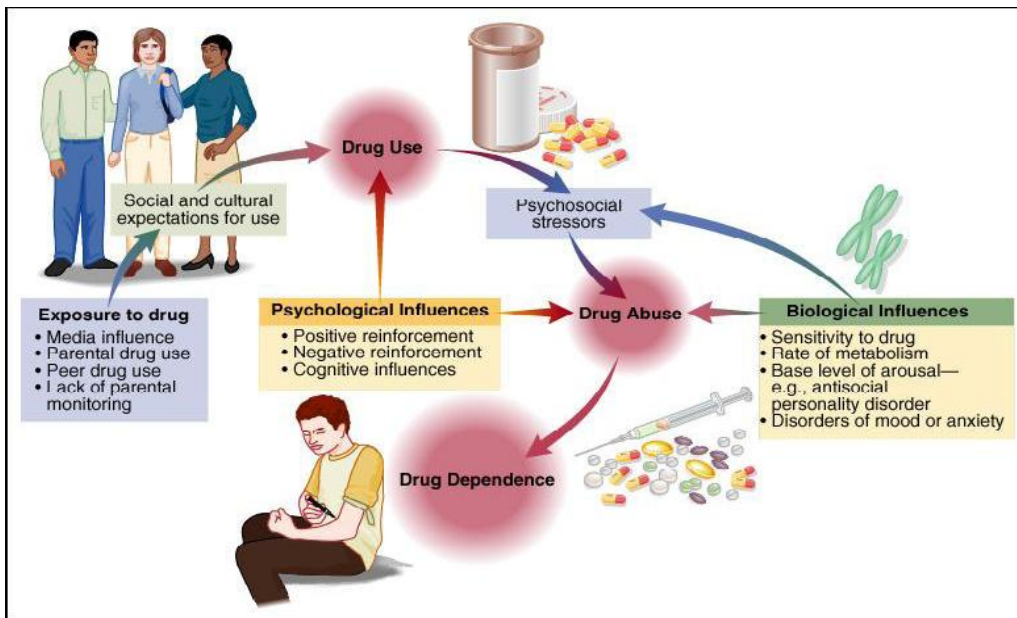


The alcohol use among college students in Africa and other parts of the world was demonstrated by the various authors. The 4<sup>th</sup> year students consumed alcohol and considered the pattern acceptable (Hingson *et al.*, 2005; Karam *et al.*, 2007).

Thus youth who consume alcohol are more likely to practice risky sexual behaviors as substance abuse drives the HIV epidemic. The UNODC revealed that, 40% of Kenyans between 15-65 years had consumed alcohol with 13% of people from all provinces in Kenya except North Eastern were regular alcohol consumers (UNODC, 2007), in contrast to alcohol use among youth aged 16-18 years was reported (Otieno and Ofulla, 2009).

### 2.1.2 Integrative Model

Writers argued that substance abuse was a complex interaction of biological, psychological and contextual factors that placed individuals at risk of alcohol (Barlow and Durand's, 2005). The integrative model of substance dependence diagrammatically depicted in **figure 2.1** suggests the pattern of alcohol use in explaining biological, genetic, psychological, social and cultural dimensions (Jung, 2001).



**Figure 2.1: Integrative model of substance abuse (Barlow and Durand, 2005)**

### 2.1.3 Ecological factors that contribute to alcohol availability.

. The expectancies developed before an individual's substance abuse might have been as a result of peers or advertisement (Kalichman, *et al.*, 2002). In the current context, socialization in drinking places, whether involved in sex work or not, demonstrate a high risk for HIV/STI (Kapiga *et al.*, 2003). Excess alcohol drinking was a serious problem and research in the United States of America and United Kingdom revealed more than 40% of college students binge drunk (Karam *et al.*, 2007). In Brazil, students bought alcohol easily in shops and this increased consumption levels suggesting that lack of restrictions to alcohol access and availability promotes access to greater varieties which increased use

(NIAAA, 2008). In Caribbean a correlation between affordability and the availability of substances was found among students (Orisatoki *et al.*, 2008). The universities are usually geographically isolated with limited alcohol access and thus when one is at close proximity to alcohol outlets, then there is vibrant business with student consumers (NIAAA, 2008).

#### **2.1.4 Universities environment and alcohol consumption among students**

The age group of students enrolled at Universities is that of freedom, experimentation and testing of previously set limits by parents and teachers in an attempt to be accepted by peers as well as develop networks and identity.

The alcohol use had serious effects in universities (Karam *et al.*, 2007). The studies among students reported 15% to 57.9% alcohol use (Otieno and Ofulla, 2009) in contrast to 13.4% in a Kenyan general population (Clausen *et al.*, 2009). The alcohol misuse was associated with unsafe sex and youth's prevalence 3-4 times higher than in the general population (UNDCP, 2004; Wechsler *et al.*, 2000). In the USA and UK, university drinking was characterized by excessive intake and drinking behavior which remained consistent among the college students (Karam *et al.*, 2007). In this regard, excessive alcohol intake influences the drinking behavior among university students.

The media, advertisements and drinking freedom at universities predisposed students to peer pressure. In the U.S.A 40% of college students binge drunk while in Africa higher levels of education was associated with HIV/AIDS (Shisana and Simbayi, 2002). Alcohol consumption hinders behavioral change, leads to none or incorrect condom use and increases abrasion as open portals for HIV/ STI transmission (MOH, 2005).

Furthermore, students from S. A had lifetime use of alcohol that was associated with risky sexual behavior (Palen *et al.*, 2006). In Turkey, medical students excessively consumed alcohol and were at risk of adverse effects which necessitated prevention (Frank *et al.*, 2008; Karam *et al.*, 2007). The peer influence and the urgent need to make new friends,

establish new peer networks and develop an identity in the new social environment that involve alcohol.

Most of the universities are near towns and annual influx has impacted on the towns due to accommodation as students report with spending power in towns. In a Botswana study, there was significant association between condom and alcohol use (Campbell, 2005). At Rhodes University, residential students in the university had limited alcohol consumption due to supervision unlike those who rented privately in town. At the university, binge drinking was correlated to the amount of supervision in the living environments (Harford *et al.*, 2002). The university administrations were under pressure to curtail excessive student drinking due to close proximity of drinking outlets on campus and in town (Slutske, 2005).

The drinking culture of an institution has an impact on students drinking behavior. The college students reported using alcohol for courage to initiate sexual intercourse but used marijuana to heighten the sexual experience. Students who reported condom use either participated in heavy episodic drinking, marijuana use or unprotected sex and were likely to have reported having HIV/STI (Roberts and Kennedy, 2006).

### **2.1.5 Smoking behavior among the youth**

The pattern of smoking among the youth begins in the early teens as advertisements lure the youth to start smoking, followed by social pressure to alcohol and substance abuse, and finally experiment and try new sexual experiences. The craving for cigarettes (gateway drugs) is driven by social environment, peers, media and institution influence which lead to sexual performance and substance abuse (Biener and Albers , 2004).

## **2.2 Burden of Sexually Transmitted Infections**

Globally, STIs are a public health problem (WHO, 2007). Furthermore, 60% of all new HIV infections annually occur among the youth aged 15-24 years (UNAIDS, 2003; WHO, 2009). Approximately, everyday more than a quarter of a million youth are infected with

an STI (UNAIDS, 2008; UNFPA, 2003). Of the annual 15 million new cases of STIs diagnosed in the US approximately a quarter of these new infections occurred among teenagers (Weinstock *et al.*, 2004). In Brazil the prevalence of STI was high in women than men while in S. A the risk was 60% for genders. The estimated average time before STI treatment was 10 and 18 days for men and women respectively and private practitioners provide a lower quality of STI care than public clinics (White, 2009).

An estimated 75-85% of STIs occur in developing countries mostly those aged 15-35 years and urban dwellers. Despite the increased risk of HIV transmission when one sexual partner is infected with an STI many individuals have sex when experiencing STI symptoms and some protected their partners by abstaining from sex or using a condom (Mabey, 2010).

The linkage between substance use and HIV/STI risky behaviors may be important among university students. The first episode of STI can thus be an important starting point for behavioral change to prevent future HIV infection and risky sexual behaviors.

The early diagnosis and treatment of STIs reduces the risk of HIV transmission (Korenromp, 2002).

The youth are vulnerable to STI acquisition due to biological and socio-cultural factors. Furthermore, sexual relationships, alcohol use, having older partners and low level of family communication were associated with STI acquisition (Crosby *et al.*, 2002).

### **2.2.1 Risk factors for Sexually Transmitted Infections**

The STIs are mostly common among the youth with multiple sexual contacts and with infected sexual partners. In the U.S.A 9 million cases of STI occurred annually among college students (CDC, 2005; Patrick *et al.*, 2007; UNAIDS, 2003).

In the USA, there is high incidence of chlamydia and gonorrhea among the youth with Human papilloma virus/vulval warts and genital warts estimated to infect 65 million American annually (CDC, 2005).

The knowledge of STI signs, symptoms and consequences is usually low. The sources of STI information include books, films and television and parents. There are several determinants of STI reported in various studies among them age, gender and sex routes.

#### **2.2.1.1 Age**

In respect to age, individual's aged 15-49 years are the most affected as they are sexually active and vulnerable to peer pressure resulting in early sexual debut (Dolan, 2005; MOH, 2005). The youth have a transitional period when multiple sexual partners, biological, psychological and social transformations occurs increasing the risky sexual behavior.

The young adults are disproportionately affected by HIV/STI, of the 18.9 million new cases of HIV/STI that occurred in the USA (48%) were 15-24 years (Weinstock *et al.*, 2004). Although this age group constitutes of  $\frac{1}{4}$  of the population aged 15-44, they acquire about half of all new STIs (Weinstock *et al.*, 2004).

The HIV/STI remains a significant public health, economic and social problem for the youth, their families and the nation.

#### **2.2.1.2 Nature of sex**

The risk of acquiring an STI through an oral sex is lower than through sexual intercourse. In Madagascar 80% of University students had sexual experiences (Rahamefy *et al.*, 2008; Okafor & Obi, 2005). The research has indicated that, the youth erroneously view oral sex as a risk-free behavior. In the UK approximately 14% to 50% of youth had oral sex before their first sexual intercourse and only a few had protective measures (Prinstein *et al.*, 2003). In California 14% –50% adolescents in California engaged in oral sex (Halpern-Felsher *et al.*, 2005).

In a Canadian and Nigerian study 78% of undergraduates had penetrative sexual intercourse (Stinson, 2010). This compares with findings from Madagascar where 80% of the students had sex in the previous 12 months (Rahamefy *et al.*, 2008). In Enugu undergraduate students experimented on substances abuse and sex (Okafor & Obi, 2005).

### **2.2.1.3 Gender**

The risk of becoming HIV infected during unprotected sex is 2-4 times greater for a woman than for a man due to biological and social factors (UNAIDS, 2002). The peak is during the youth as they get sex information from peers, socio-media and other networks.

### **2.2.1.4 Types of STI**

The American college students perceived themselves to be at risk of contracting HIV/ STIs than other students (Robert and Kennedy, 2006). The STIs serve as an indicator of sexual risk, compromise immune systems and increase the likelihood of HIV transmission (Duncan *et al.*, 2002).

Approximately 25% of adolescents acquired at least one STI before graduation. Herpes simplex virus type II (HSV-2) was the most prevalent STI, a cause of genital ulcer diseases that disrupts the epithelial barrier and inflammation that increases the risk of HIV-1 transmission (Holland-Hall *et al.*, 2002).

## **2.3 HIV/AIDs risk factors**

Globally, youth below 25 years accounted for 45% of new HIV infection with the majority of them from SSA, followed by South East Asia and Eastern Europe (UNAIDS, 2008). The youth aged 15-24 years were at the epicenter for HIV/AIDS comprising of 50% of all new HIV infections and hence prevention interventions that target to decrease the transmission is among this group (WHO, 2004).

In SSA many African health service workers felt it was inappropriate to provide contraceptives to youth, often making it difficult or impossible for youth to obtain condoms and other contraception (UNAIDS, 2008). The youth however avoided reproductive health services predisposing them and their sexual partners to HIV risks (WHO, 2009). Approximately 40% of youth aged 15–24 years in SSA had used condoms with multiple partners during sex the previous 12 months with a 10% increase in condom use among the youth (UNICEF and WHO, 2010).

The findings from S. A revealed that, females had no right to refuse sex or demand condom use once gifts were accepted (Cote *et al.*, 2004). Findings from a S. A study “men who have sex with men”(MSM) revealed that unprotected anal intercourse was significantly associated with regular alcohol drinking and use of crack cocaine, methamphetamine and other substances that apparently facilitated such sexual encounters (Parry *et al.*, 2006).

In Kenya, MSM accounted for 15% of HIV incidence in 2006 (Gelmon *et al.*, 2009).

In Kenya, transmission during IDU accounted for an estimated 3.8% of new HIV infections in 2006 (Gelmon *et al.*, 2009). In Mombasa needle sharing was a common way of HIV transmission with an HIV prevalence of 68%-88% among IDUs in Nairobi and Mombasa respectively (NACADA, 2004; UNODC, 2007).

There are outdated negotiation skills, lack of HIV knowledge, unawareness of HIV status, lack of communication about HIV/AIDS, infrequent clinic visits and medical check-ups among the youth (Pettifor *et al.*, 2009). Despite high levels of sexual activity, youth do not know the basic HIV/STI facts hence unable to have protective measures (UNAIDS, 2008).

The studies indicated the presence of gaps between HIV knowledge and practices regardless of gender, residence and education level (Gaillard *et al.*, 2006). The university students aged 19-26 years have a moderately good HIV/ STI Knowledge. The behavior change need to be tailored to the needs and values of the youth as sexual debut for youth occurs during teenage years.

The unprotected oral sex, eroticize ejaculation fluids, oral stimulation and ejaculation directly onto the partner's face or mouth is common among university students (Klein, 2009). The university students engage in risky sexual practices due to trust, peer influence, internet pornography, substances, sexual adventures and anonymous sex (Luhanga, 2006; Narismulu, 2004; Pettifor *et al.*, 2009; Rosengard *et al.*, 2006).



## **2.4 Substance abuse and risky sexual behavior**

There is a significant association between substance abuse, multiple sexual partners and inconsistent condom use compared to non users . Substance abuse places them at high risk for STI, including HIV infection (Hadland *et al.*, 2011). The sexually active youth who engaged in substance abuse were unlikely to use condoms (Hodgson *et al.*, 2013).

The knowledge of condoms in preventing HIV/STI transmission is less common among the youth. According to an American study, alcohol-related sexual behavior was common among college students (Lewis *et al.*, 2009). Also in Brown University students who used alcohol had unprotected sex (Kiene *et al.*, 2009). In Durban findings revealed an association between substance abuse and sexual intercourse but substance abuse as alcohol affect sexual decision making (Lewis *et al.*, 2009).

## **2.5 Policies in the Universities**

The public sector workplace policy on HIV/AIDS recommended the provision of counseling services at the workplace for all government ministries and public institutions (HIV/AIDS Policy, 2005). In regions where condoms are available, limited distribution systems had made access problematic. The government outlets are dispersed and private sectors are limited to urban areas, resulting in uneven availability. The university students face difficulties obtaining condoms because of the cost, limited accessibility and unavailability. The substance abuse negatively affect students hence an ideal university policy to address issues of preventive education and behavior change. The university policy should be developed involving students, the workers and managers through the commitment and ownership from top management.

The models placed before the youth through the media and entertainment aid the human relationships on sexual practices (Kelly and Otaala, 2002). The ACU has incorporated HIV/AIDS service program and produced guidelines (ACU, 2002). In 2002 less than half of 100 member universities surveyed by the ACU had developed institutional policies on

HIV/AIDS (ACU, 2002). The tertiary institution's AIDS policies should comprise of staff, researchers and community service, supportive staff and students in the campuses.

An institutional policy on HIV/AIDS contained the problem, commitment, safety procedures, services and resources, legal aspects and a commitment to community action (ACU, 2002). The initiatives to handle substance abuse and HIV/AIDS within universities must begin at home.

An institutional policy will only be as effective as the leadership that owns and support it (ACU, 2002). The AIDS coordination units have created an impact at the University of Cape Town, Botswana, Natal, Namibia, Witwatersrand and University of Dar es Salaam.

The intervention programs at the universities and prevention successes can be accomplished by collaboration among the national agencies, local organizations, private sector and community-based groups

The AAU recognized curriculum reform for graduates in an HIV/AIDS affected society (AAU, 2007). During the 2009 HIV/AIDS survey of 35 institutions in SSA, had findings on institutional strategic plans, HIV integration in curricula and the extent to which activities influenced individual behavior and processes within the institutions(AAU, 2007). In Kenya, substance abuse escalated rapidly with marked changes in users' demographic profile as youth initiated the act (NACADA, 2004).

Thus, University policy on substance abuse and HIV/STI was necessary to create awareness on the harmful effects of substances and HIV/STI detection and intervention. It is imperative that universities implement policies to stem substance abuse and HIV/STI spread (Kelly, 2002).

To support the institutional development responses ACU produced an HIV/AIDS "toolkit" for tertiary institutions to support the development and management of HIV/AIDS (Chetty, 2003). The Universities' surrounding lead to inappropriate a culture

of silence (Chetty, 2003). The university of Botswana, Cape Town, Natal, Kenyatta and University of Namibia have established HIV/AIDS units to coordinate activities across the institutions (AAU, 2007).

## CHAPTER THREE:

### 3.0 MATERIALS AND METHODS

#### 3.1 Study area

The study was conducted among students in selected main campuses of Kenyan Public Universities namely; JKUAT, Kenyatta, Maseno and constituent University Colleges namely; Kimathi and Narok



Figure 3. 1: A map of Kenya showing location of the selected universities

Key:

A. Jomo Kenyatta University of Agriculture and Technology

B. Kenyatta University, Nairobi, Kenya C. Kimathi University College of Technology.

E. Maseno Univeristy- Kenya.

F. Narok University College.

### 3.2 Study design

A cross-sectional descriptive study design was used where data was collected in respect to substance abuse and HIV/STI as well as other risky sexual behavior.

#### 3.2.1 Independent Variables

The various independent variables addressed were age, sex, hostel, rented apartments, condom use, unprotected sex, sexual partners and HIV/STI.

#### 3.2.2 Dependent Variables

The various dependent variables were substance abuse such as alcohol, marijuana, tobacco, amphetamines and cocaine use.

### 3.3 Study population

The study population consisted of 4<sup>th</sup> year students were selected from various Kenya public universities. Male and female were proportionately represented in all the faculties.

### 3.4 Sampling

#### 3.4.1 Sample size determination

The required sample size was calculated using the formula of estimating a single population proportion for a cross-sectional survey (Fishers *et al.*, 1998).

$$n = [Z / 2 p(1-p)/d^2]$$

Where, **n** is the required minimum sample size, **Z / 2** is a standard score corresponding to 95% CI thus equal to 1.96, **P** is the proportion of substance abuse, since information on substance abuse in Kenyan Universities was not available, 50% (0.5) was used to get the possible maximum sample size, **d** is the margin of error and was taken to be 5% (0.05), Due to multistage nature of the study a design effect of 1.5 was considered,

$$n = 1.96^2 \times 0.5^2 / 0.05^2 \times 5 \text{ universities} = 2880$$

Accordingly, the final sample size was 2880 subjects.

#### **3.4.1.1 Inclusion criteria**

All the 4<sup>th</sup> year students aged above 18 years and willingly gave an informed consent.

#### **3.4.1.2 Exclusion criteria**

Students who refused to give informed consent and those who were not in session.

#### **3.4.2 Sampling procedure**

A list of all Kenyan Universities and Colleges was obtained from the Commission of Higher Education in Kenya. Stratification of Universities and College universities was from the seven public mother Universities which have resident student population and College universities. Random sampling was done from each of the stratum to attain three universities namely; JKUAT, Kenyatta, Maseno and two college universities namely Kimathi and Narok that were randomly selected. Due to the size of some Universities each university specific estimated sample size was adjusted guided by Probability proportionate to size sampling (PPS).

From all the selected universities with the total population of 9,574 PPS was done to allocate 2,880 questionnaires. Sampling was stratified and was based on PPS to the total population in enrolment size of the randomly selected 4<sup>th</sup> year students in the selected Kenyan public universities. A list of all fourth year students was obtained and systematic random sampling was used to recruit every 3<sup>rd</sup> student till the sample size was achieved.

**Table 3.1. Probability proportionate to size sampling for the universities**

<b>University</b>	<b>4<sup>th</sup> year population</b>	<b>Sample size</b>	<b>Interval</b>
JKUAT	2,400	722	3 <sup>rd</sup>
Kenyatta	3,812	1146	3 <sup>rd</sup>
Maseno	2,080	625	3 <sup>rd</sup>
Kimathi	150	46	3 <sup>rd</sup>
Narok	1,132	340	3 <sup>rd</sup>
<b>TOTAL</b>	<b>9,574</b>	<b>2880</b>	<b>3<sup>rd</sup></b>

### **3.5 Data collection tools**

During data collection several tools for data collection were used.

#### **Quantitative data tools**

##### **3.5.1 Semi Structured Questionnaires (SSQ)**

Anonymous self administered questionnaires were distributed publicly to the participants through systematic random criteria. Communication about the study was done through the administration where memos were drafted and placed in notice boards. The selected study subjects were requested to avail for an interview at a place that they felt comfortable and were given two days to fill the questionnaires before the collection.

## **Qualitative data tools**

### **3.5.2 Focus Group Discussions (FGDs)**

The FGDs comprised of twelve male or female students who were randomly selected and led by a trained moderator through an open free-flowing discussion. There were two male and female FGDs from each of the selected public university. The moderator generated substance abuse and HIV/STI ideas from the subjects within 30 minutes.

### **3.5.3 Key Informants Interview (KII)**

The KII comprised of one University Administrator in policy formulation, in charge or Chairman of a Department from a Faculty who were randomly selected. They were interviewed and led by a research assistant who administered questions on different substance abuse and HIV/STI ideas within the 15 to 20 minutes.

### **3.5.4 Qualitative Data Sampling Procedure Guide**

Two FGDs each comprising of twelve students (Appendix 11) from each gender were conducted in each university through convenience sampling in each of the five universities was done from the lecture theatres. Five Key Informants (Appendix 111) were interviewed where one University Administrator of a Department or a Chairman of a Department from a faculty were interviewed in each university.

## **3.6 Data management**

The data collected from questionnaires as well as the focused group discussions and key informant interviews was used to investigate the association between substance abuse and HIV/STI risky related behavior among student in the selected public universities.

### **3.6.1 Data entry and storage**

Data entry was done using Microsoft access through using unique identifiers in duplicate for validation (double entry) and exported in SPSS version 17. The data was cleaned,



cross-checked for entry errors and range checks. Data storage was done on flash disks and desktops while questionnaires sheets were kept under lock and key.

### **3.6.2 Data analysis**

Quantitative data was analysed using Statistical Package for Social Sciences (SPSS) version 17.0 for windows. Qualitative data was typed into MS Word was exported to NVivo version for coding and analysis based on themes (thematic analysis) and described. Categorical variables were compared using Chi square test. Bi-variate and multi-variate analysis for comparisons of predictor variables was tested separately and then included variables that were significant in a multivariate analysis. Variables with  $P < 0.05$  in the logistic regression were considered to have a significant association with substance use and HIV/STI risk behaviors. Logistic regression was performed on multiple variables hypothesized to explain association between substance abuse and HIV/STI risks. Backward conditional method was used to establish significance. The predictors of substance abuse and HIV/STI were estimated by Odds Ratios (OR), 95% Confidence Interval (CI) and a  $P$  value  $< 0.05$  was considered significant.

### **3.6.3 Data presentation**

Frequencies and bar graphs were used to present categorical variables. Descriptive statistics including mean, standard deviation, ranges, frequency distribution and proportions were done for different groups i.e. risky sexual behavioural practices, age and substances abused.

### **3.7 Ethical considerations**

Restricted access to the information collected and coding of questionnaires was observed. The researcher sort approval from the Universities' administration to collect data from consenting students. Approval was sought from KEMRI, Scientific Steering Committee (SSC), National Review Committee for Scientific and Ethical issues respectively. The informed consent was obtained and signed by students (Appendix V&V1). University's

administration conveyed and sensitized the students through memorandums and posters about the study. Subjects were requested to avail themselves for an interview at a place that one felt comfortable. Interviews were in private, code identification was used and personal information from the interview was not released without written permission from the subjects. Consent forms and questionnaires were kept under key and lock to ensure high level of confidentiality and privacy. Subject's participation was voluntary and could refuse to participate or withdraw from the study at any point.

### **3.8 Assumptions**

The substance abuse exposure could not be assumed to be linearly related to the HIV/STI risks given the complexity of sexual activity factors. Some subjects might have had experienced nonconsensual intercourse but never sought clarification from the researcher. The generalizability of the study findings was limited as sample was limited to 4<sup>th</sup> year university students.

### **3.9 Reliability and validity**

The study applied a standardized, pretested questionnaire used for both quantitative and qualitative study methods. The sampling procedure used was appropriate to the study and representativeness. The study addressed sensitive issues being the only of a kind in the Kenya Public Universities.

## CHAPTER FOUR:

### 4.0 RESULTS

#### 4.1 Socio demographic characteristics of the study respondents

##### 4.1.1 Age distribution of respondents

A total of 2880 questionnaires were administered, filled and collected from the respondents. The mean age of students interviewed was 24 years in all the universities indicating that majority were young. The highest proportion (65%) of students at Kimathi University aged 21-25 years and (60%) aged 21-25 years at Maseno where the highest proportion of students (39%) aged 26-30 years against the lowest at Kimathi that had (34%).

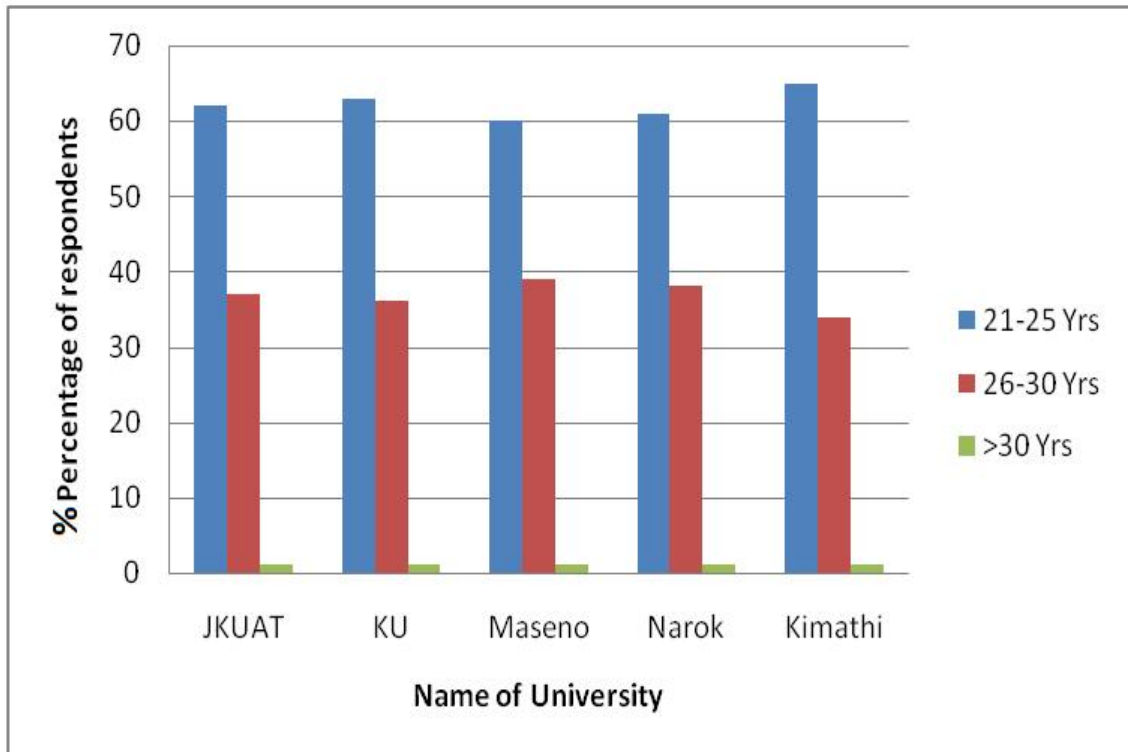
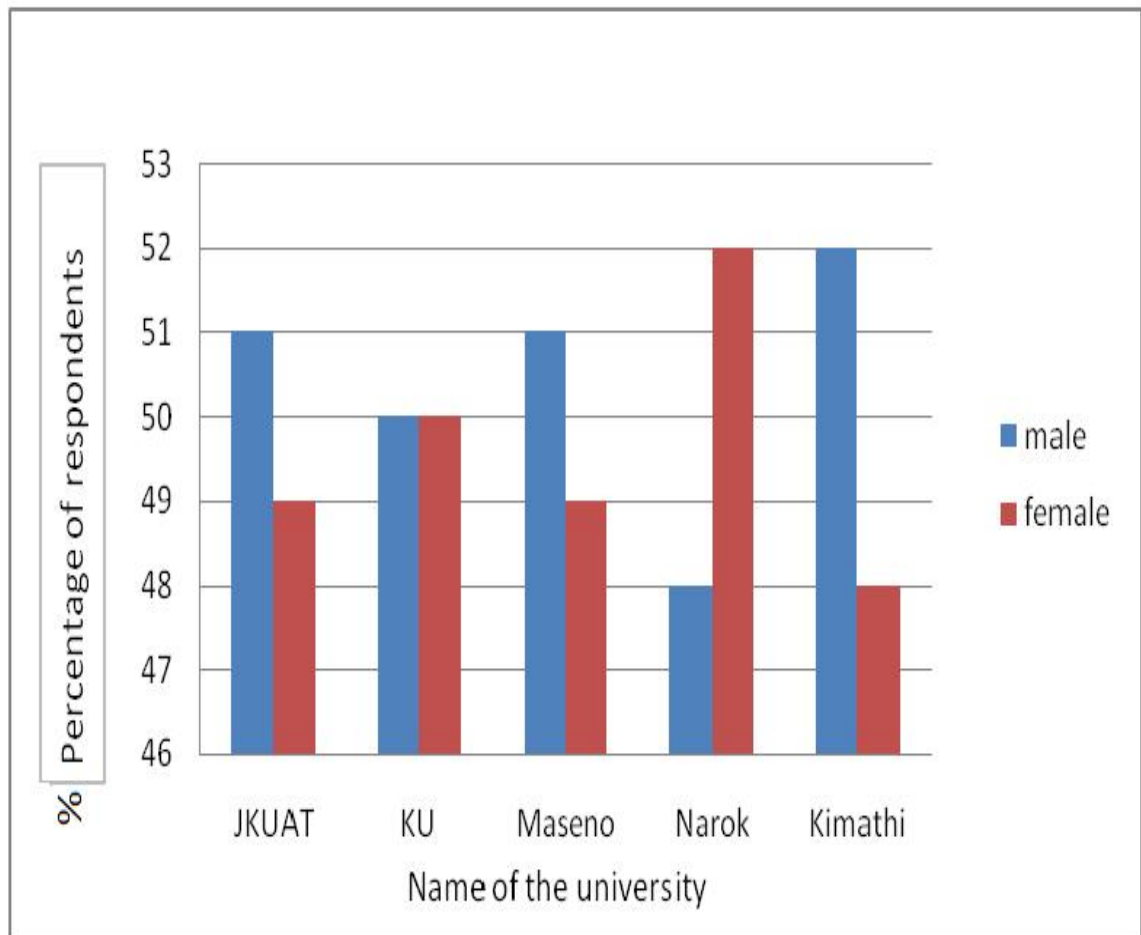


Figure 4. 1: Age distribution of respondents by University

#### 4.1.2 Sex distribution among the study respondents

**Figure 4.2** shows the distribution of the respondents according to sex indicating that the proportion of male respondents was highest and Kimathi (52%) while JKUAT and Maseno had (51%) respectively. However, the proportion of female respondents was highest at Narok that had (52%) but at KU the ratio between genders was equal at (50%) a reflection of the 2008 university admission policies that promoted affirmative action in admission of female students.



**Figure 4. 2: Distribution of respondent's sex by University**

### 4.1.3 Characteristics of living quarters of study respondents

Characteristic of living quarters of respondents showed that majority (55%) of the students rented private accommodation though a reasonable number (45%) resided in the university halls in all the universities. The rest of the students either stayed with a relative in the hostel, accredited hostel or at home but both KU and Narok had (6%) of students who resided in accredited hostels.

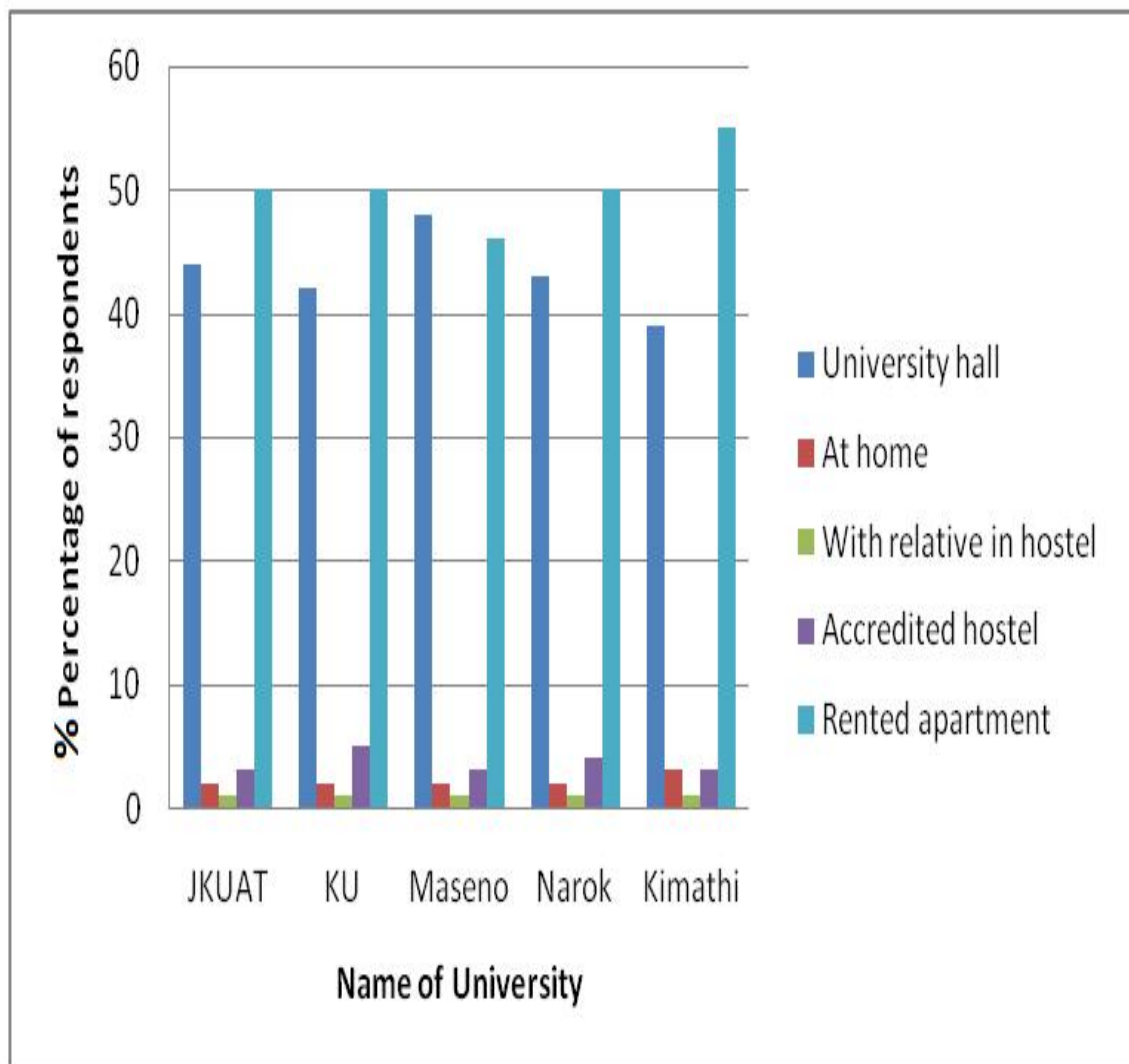
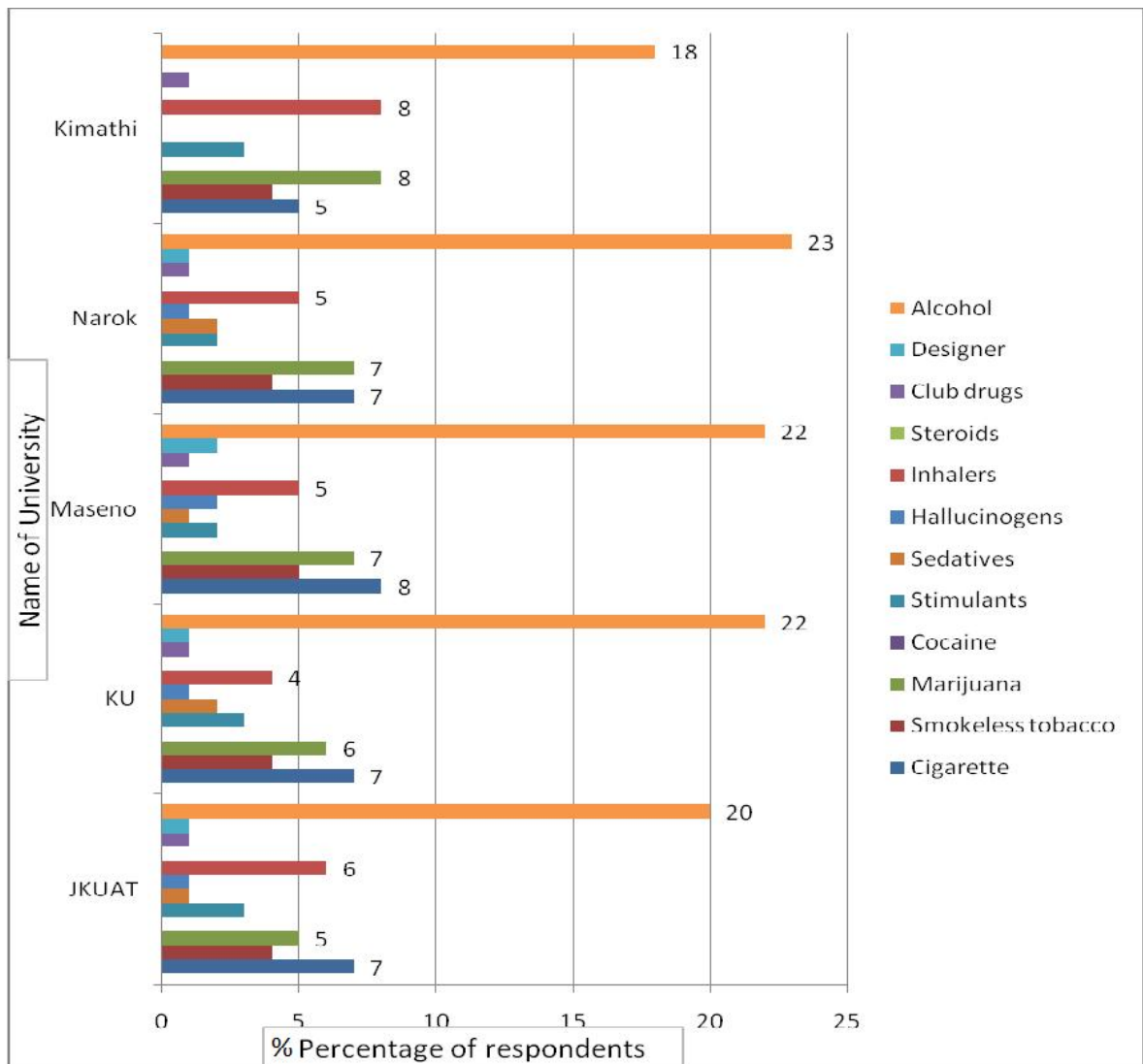


Figure 4. 3: Characteristics of respondent's living quarters by university

## 4.2 Commonly abused substances among the study respondents

### 4.2.1 Prevalence of substance abuse among the study respondents

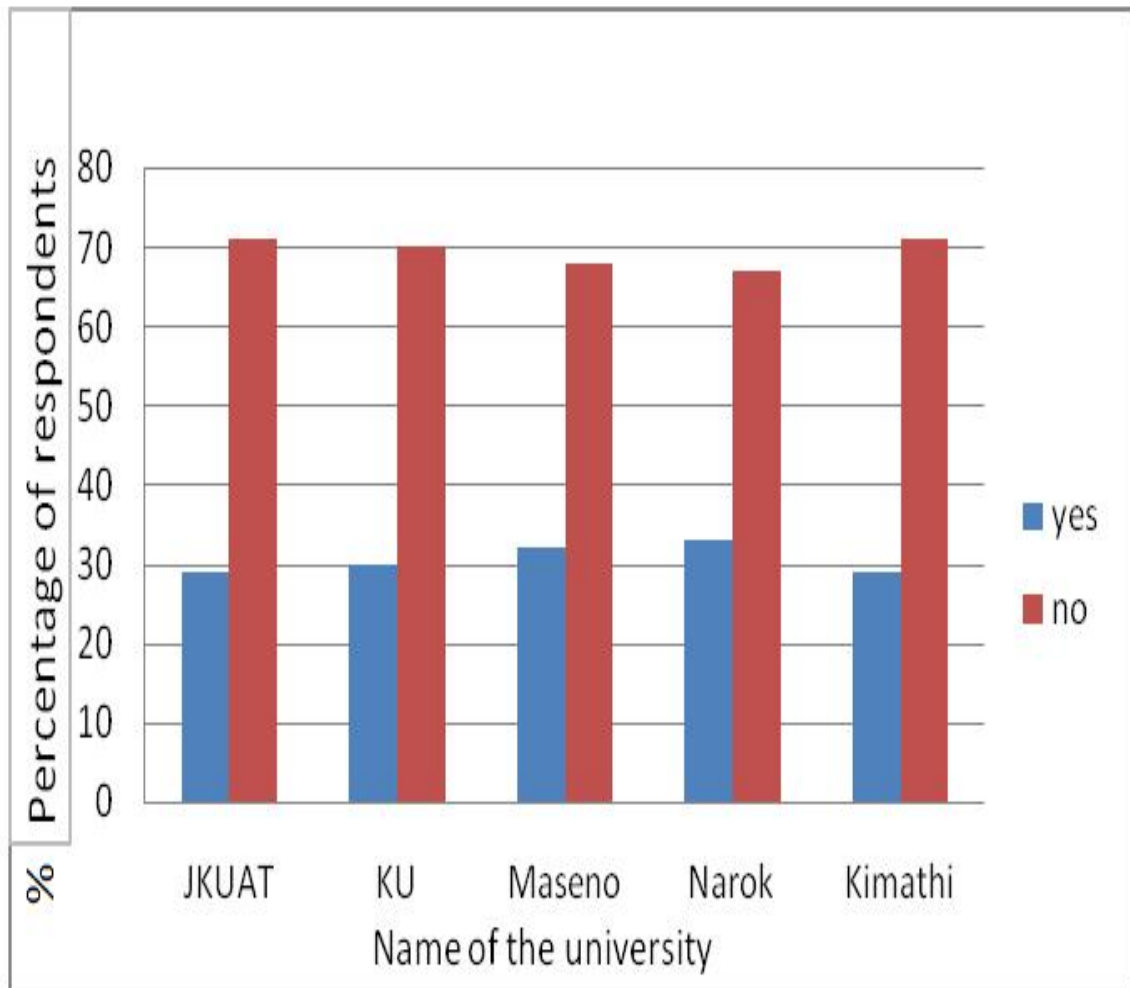
The commonly abused substances were alcohol and cigarettes with a high proportion of students at JKUAT at 20% and 7% respectively. Marijuana 5% smokeless tobacco 4% and stimulants 3% were also consumed among other abused substances.



**Figure 4.4: Prevalence of substance abuse among the study participants**

#### 4.2.2 Distribution of substance abuse among respondents by universities

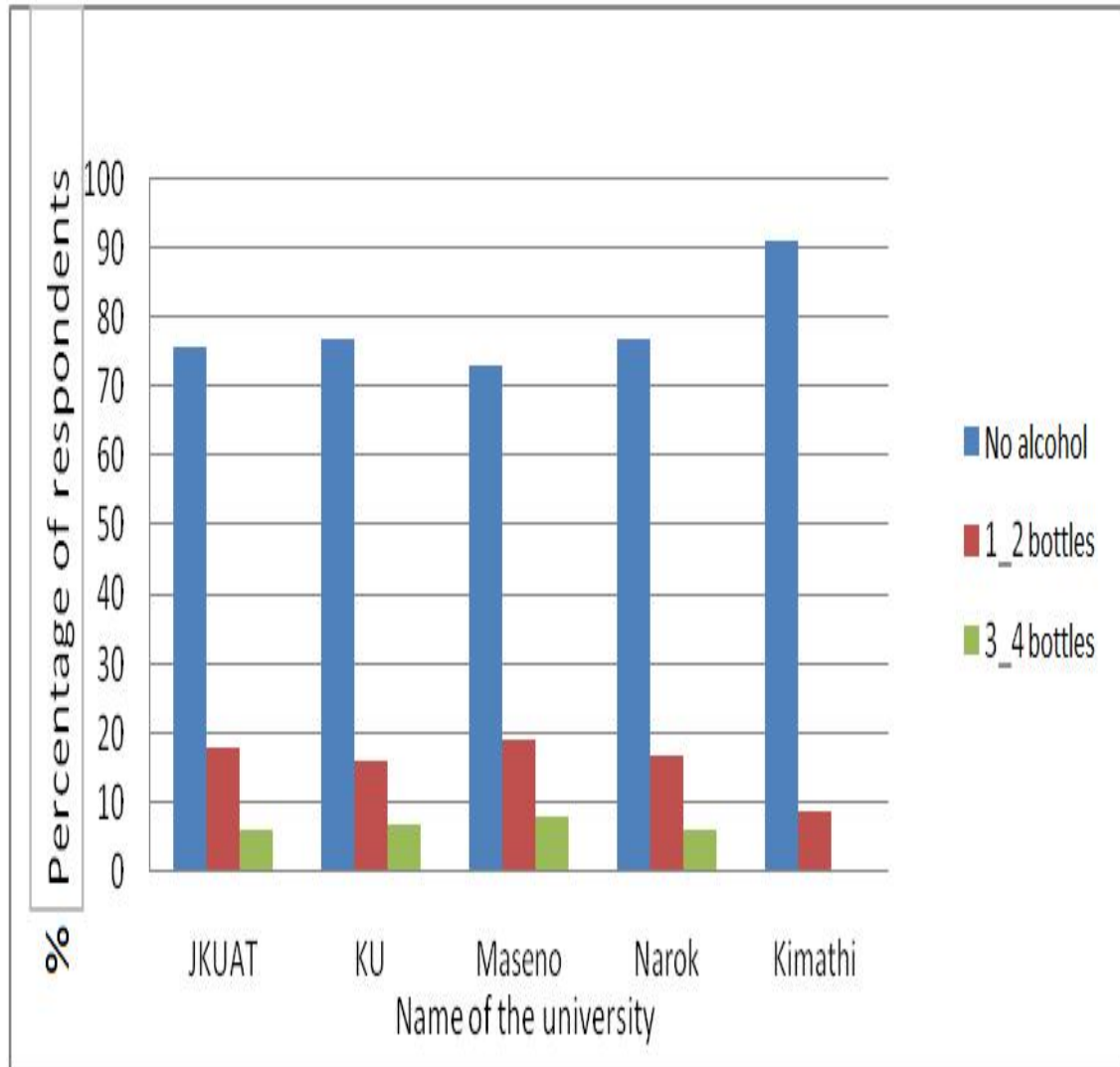
Based on the study it was notable that (31%) of the students abused substances in all the universities with (69%) being non consumers as shown in **figure 4.5**.



**Figure 4.5: Distribution of the respondents that reported substance abuse**

### 4.2.3 Alcohol consumption among study respondents

Further (8%) of the students moderately consumed alcohol but (15%) of the students across all the universities consumed 1-2 beers and (8%) consumed 3-4 beers apart from Kimathi University.

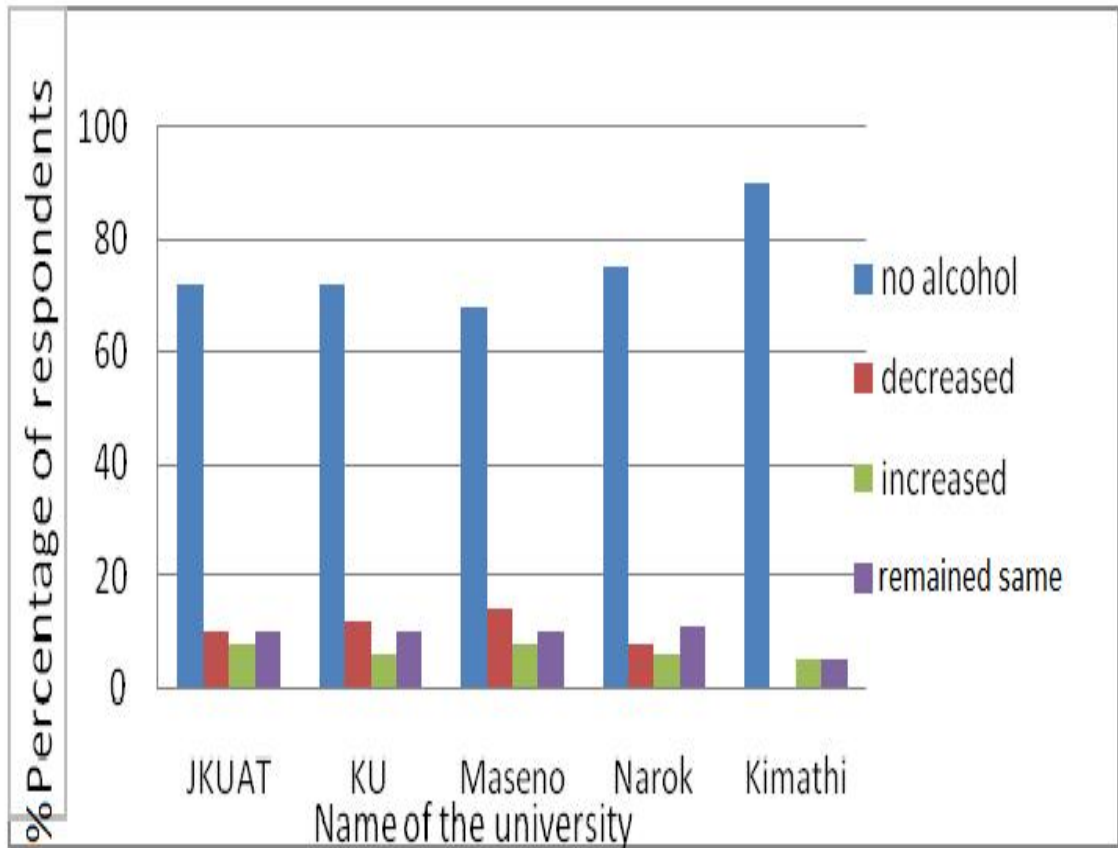


**Figure 4.6: Distribution of respondents by alcohol consumption**



#### 4.2.4 Pattern of alcohol consumption among the study respondents

The vast majority (68%-90%) of the students in the universities reported no alcohol use. Those who reported a decrease in consumption was (8%-14%) with Kimathi reporting no decrease in alcohol use. The pattern of alcohol use among students who reported that alcohol consumption remained the same or decreased at approximately (10%) and this never varied significantly in all the universities except Kimathi where students reported a (5%) decrease.



**Figure 4.7: Pattern of alcohol consumption among the respondents by University**

#### 4.2.5 Weekend alcohol consumption among the study respondents

Approximately (90%) of students at Kimathi revealed no alcohol use though consumption was 3-4 beers over the weekend. Consumption was moderate at 1-2 beers among the majority of the university students.

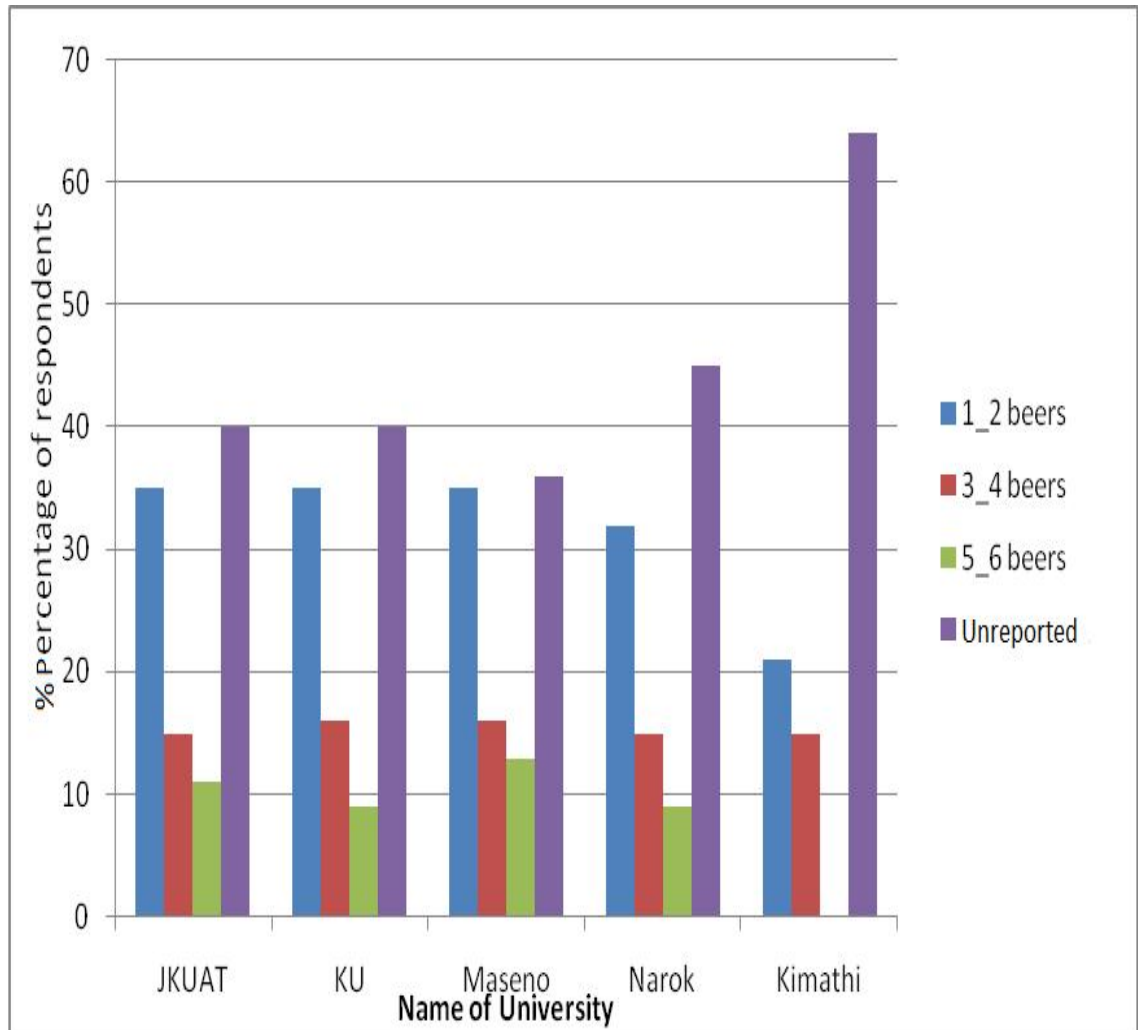
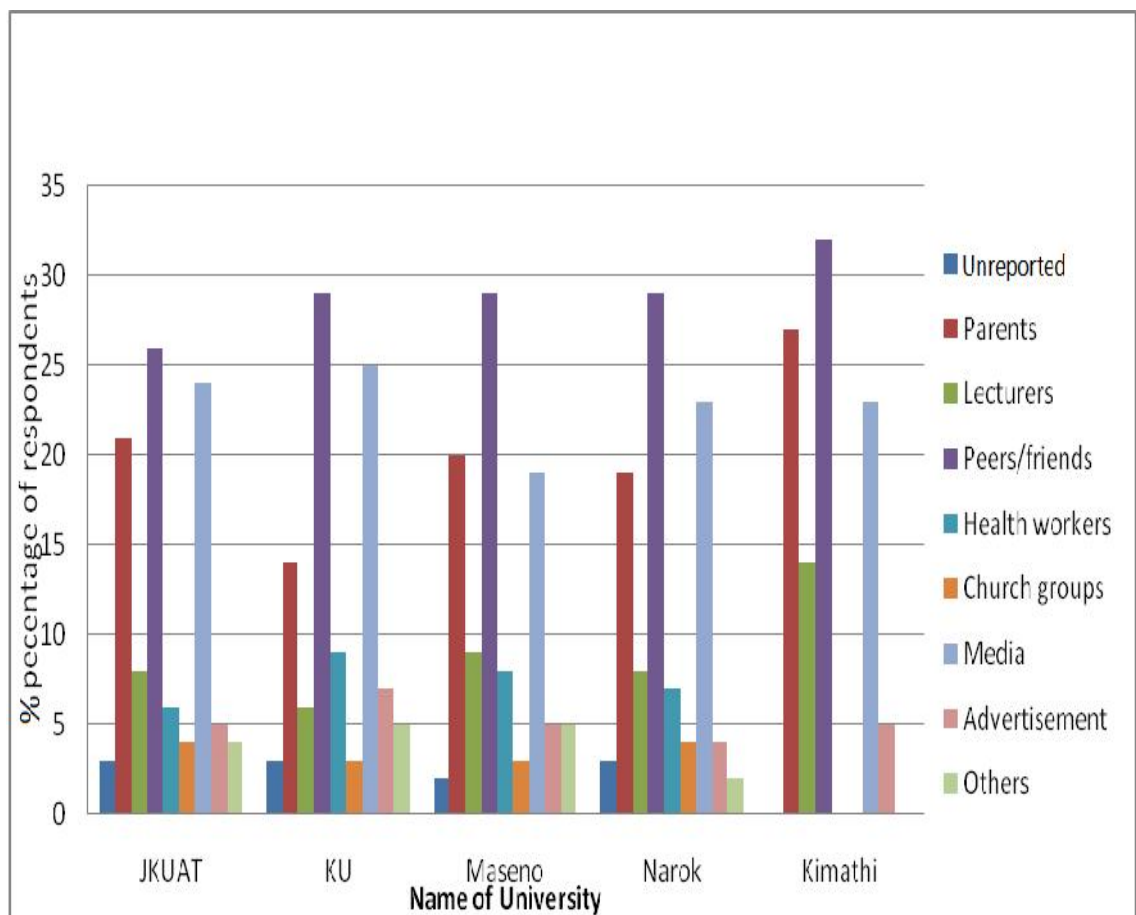


Figure 4.8: Weekend alcohol consumption among the respondents by University

### 4.3 Information and knowledge availability among the respondents

#### 4.3.1 Source of sex education among the study respondents

To assess the student's source of sex information and education that were known by the majority of the students, respondents were asked to mention the source of sex of education. **Figure 4.9** revealed the proportion of students who mentioned a specific method as source of sex education. Approximately (37%) of the respondents received HIV/STI information from peer/ friends, media (28%) parents (17%) and (18%) of the students obtained information from lecturers and health workers among other sources.



**Figure 4.9: Source of sex education among the respondents by University**

### 4.3.2 Knowledge on sexual route on STI transmission among study respondents

Table 4.1 shows that receptive vaginal sex was revealed by majority (50%) of students as the route of STI transmission in the Universities and insertive vaginal sex (30%) though (11%) revealed insertive oral vaginal sex as a route of transmission among others.

**Table 4.1: Knowledge on sexual route on STI transmission among respondents**

Type of sex for STI transmission	JKUAT	KU	Maseno	Narok	Kimathi	Total
Insertive vaginal	1180(77%)	322(76%)	624(74%)	736(77%)	66(86%)	351(30%)
Receptive vaginal	267(17%)	73(17%)	165(19%)	163(17%)	6(8%)	594(50%)
Insertive oral	18(1%)	5(1%)	18(2%)	15(2%)	2(3%)	135(11%)
Insertive anal	47(3%)	14(3%)	26(3%)	33(3%)	2(3%)	38(3%)
Receptive anal	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)

### 4.3.3 Availability of STI/HIV posters in the universities

Figure 4.10 shows that (78%) of the students reported availability of STI/HIV posters in the Universities and (20%) reported unavailability.

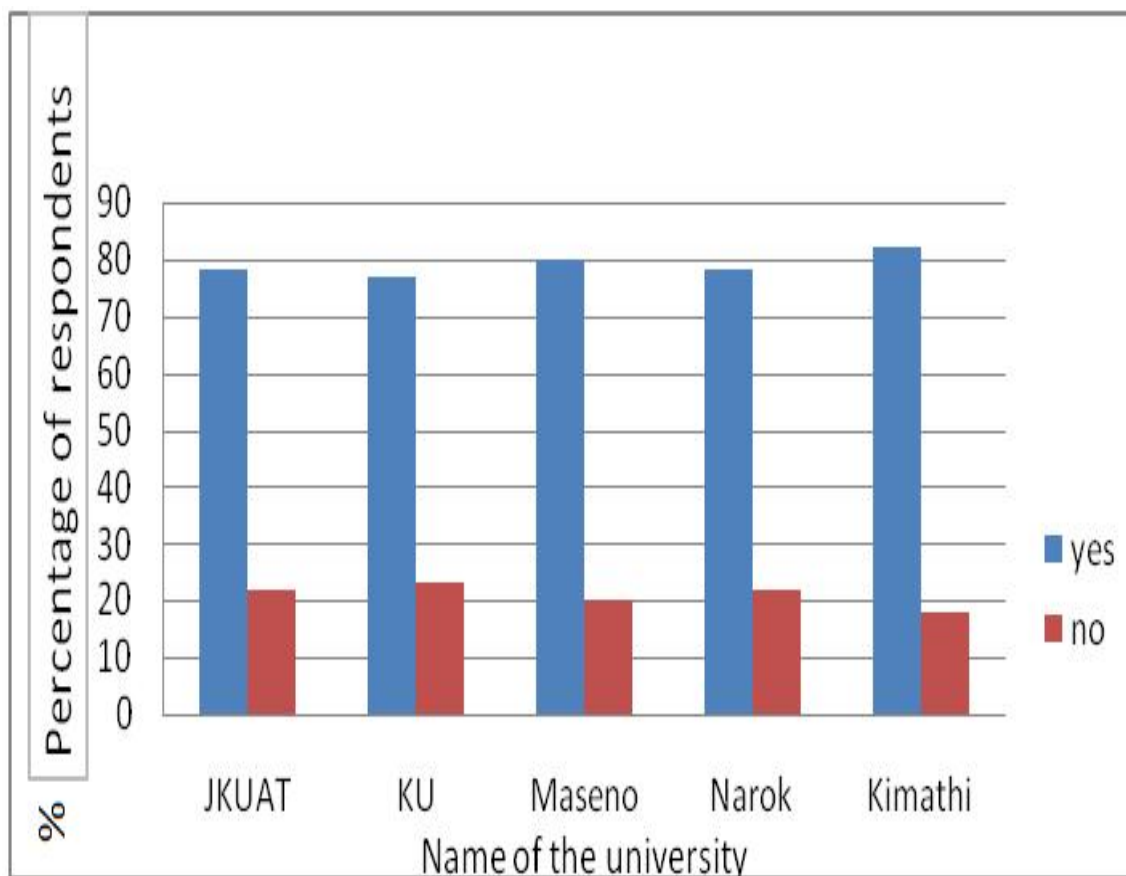
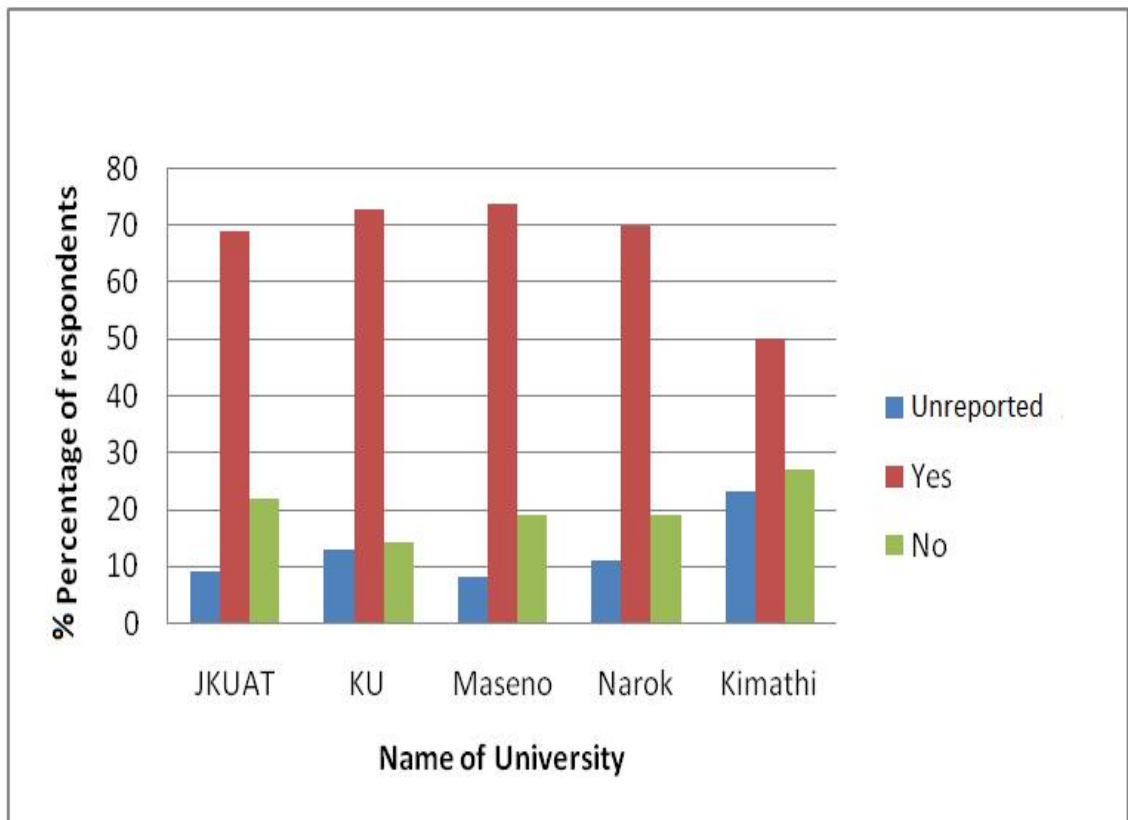


Figure 4.10: Reported availability of STI/HIV posters by University

#### 4.4 Risky sexual behaviors practiced by study respondents

##### 4.4.1 History of sex in the last 12 months among the study respondents

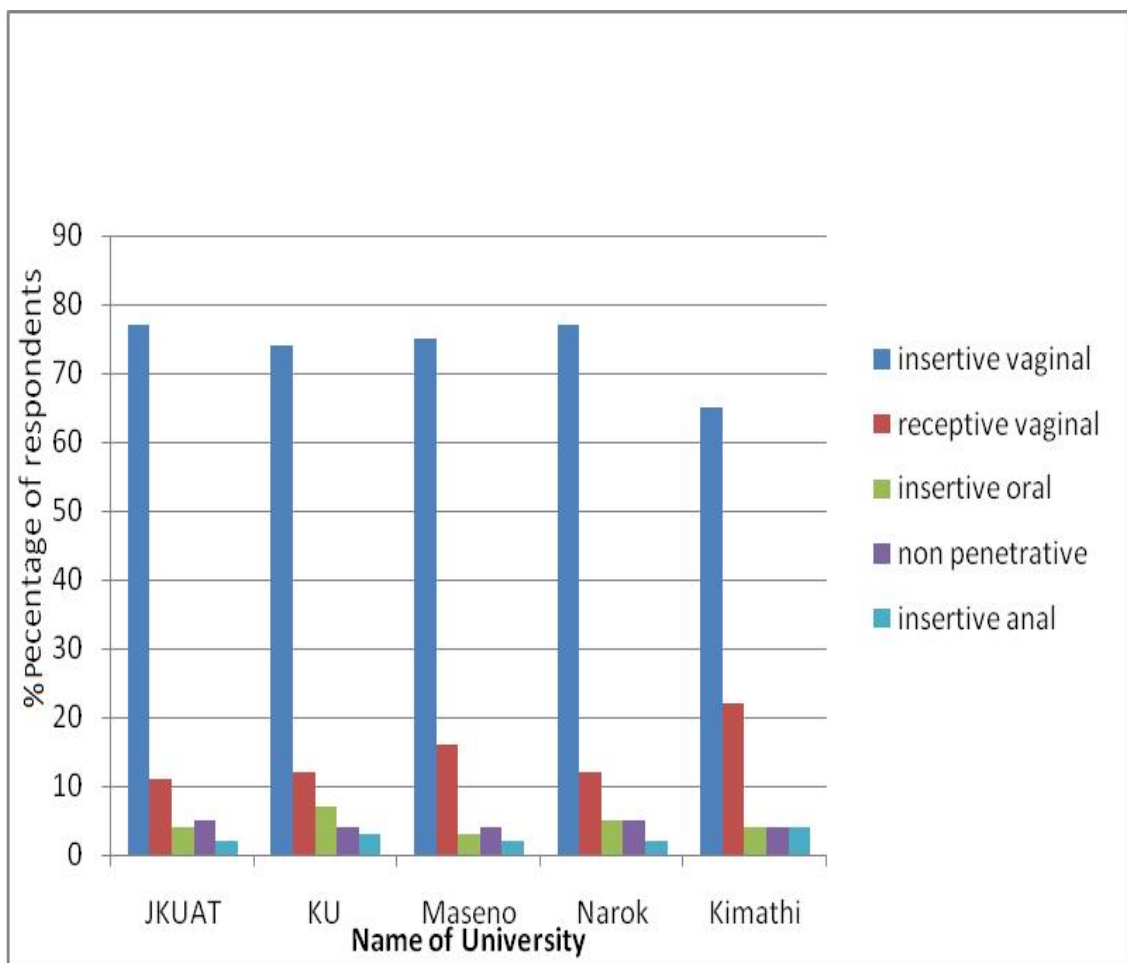
**Figure 4.11** shows that sex within the last 12 months was assessed. A substantial proportion (50%-75%) of the students had sexual intercourse in the last 12 months with (73%) at Maseno though (9%-24%) of the students across all universities revealed never to have had sex.



**Figure 4.11: Sex history in the last 12 months among the respondents by University**

#### 4.4.2 Types of sex among the study respondents

**Figure 4.12** shows that more than half of the University students had the most preferred sex as receptive vaginal sex (52%) both at Narok and Maseno. A population of (50%) at Kimathi University had insertive vaginal sex while JKUAT and Narok had (30%) respectively. The insertive oral sex was (15%) at Maseno and insertive vaginal at (25%) but Kimathi registered none.



**Figure 4.12 Type of sex among the respondents by university**

#### 4.4.3 Sexual risks among the study respondents

Overall, perceived risk of acquiring HIV/STI differed significantly across Universities with the highest prevalence of perceived risk at (17%) reported in Maseno University while JKUAT and Narok had (14%) respectively. A population of (10-15%) of the respondents knew that they would acquire STI/HIV among other risks due to unprotective sex as shown in figure 4.13.

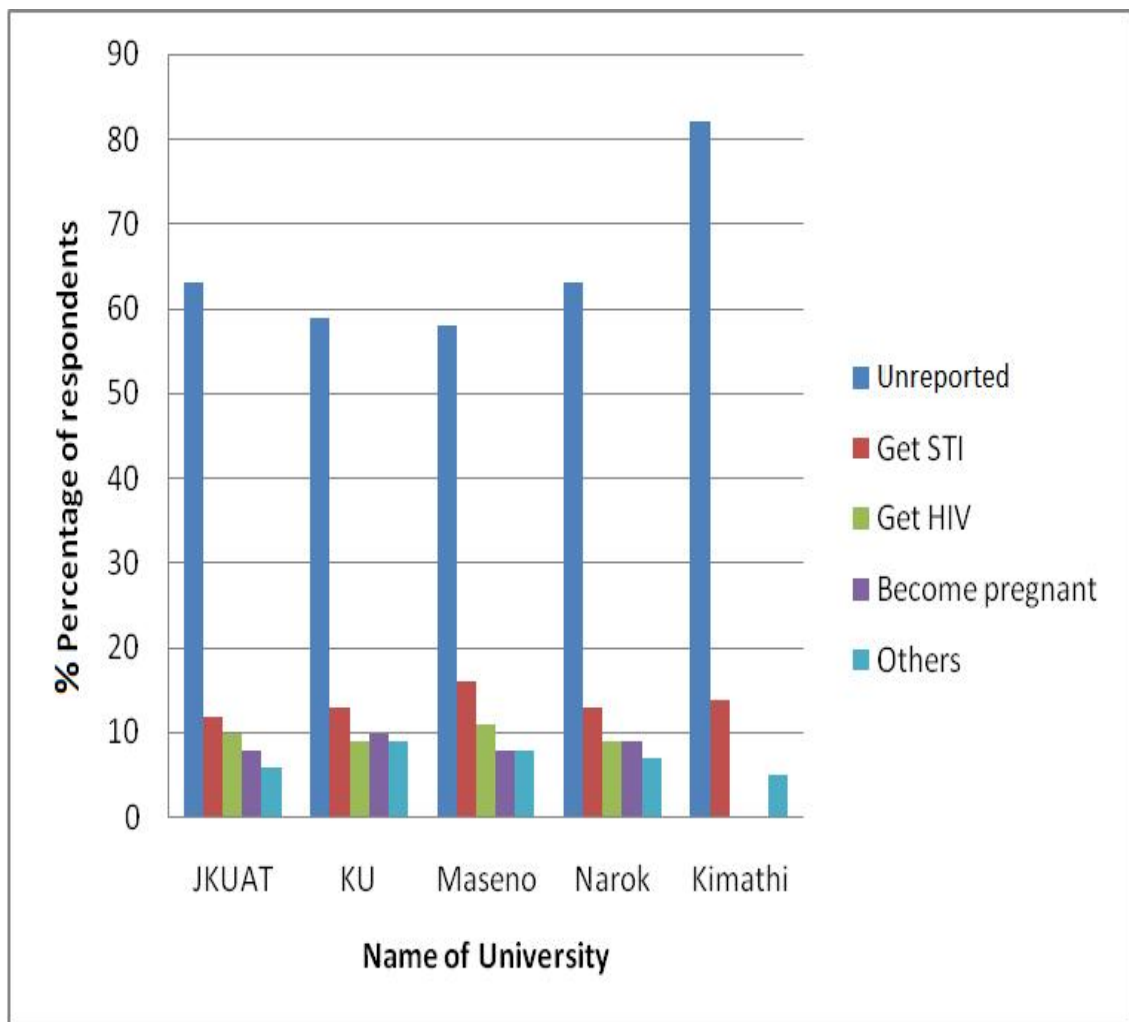
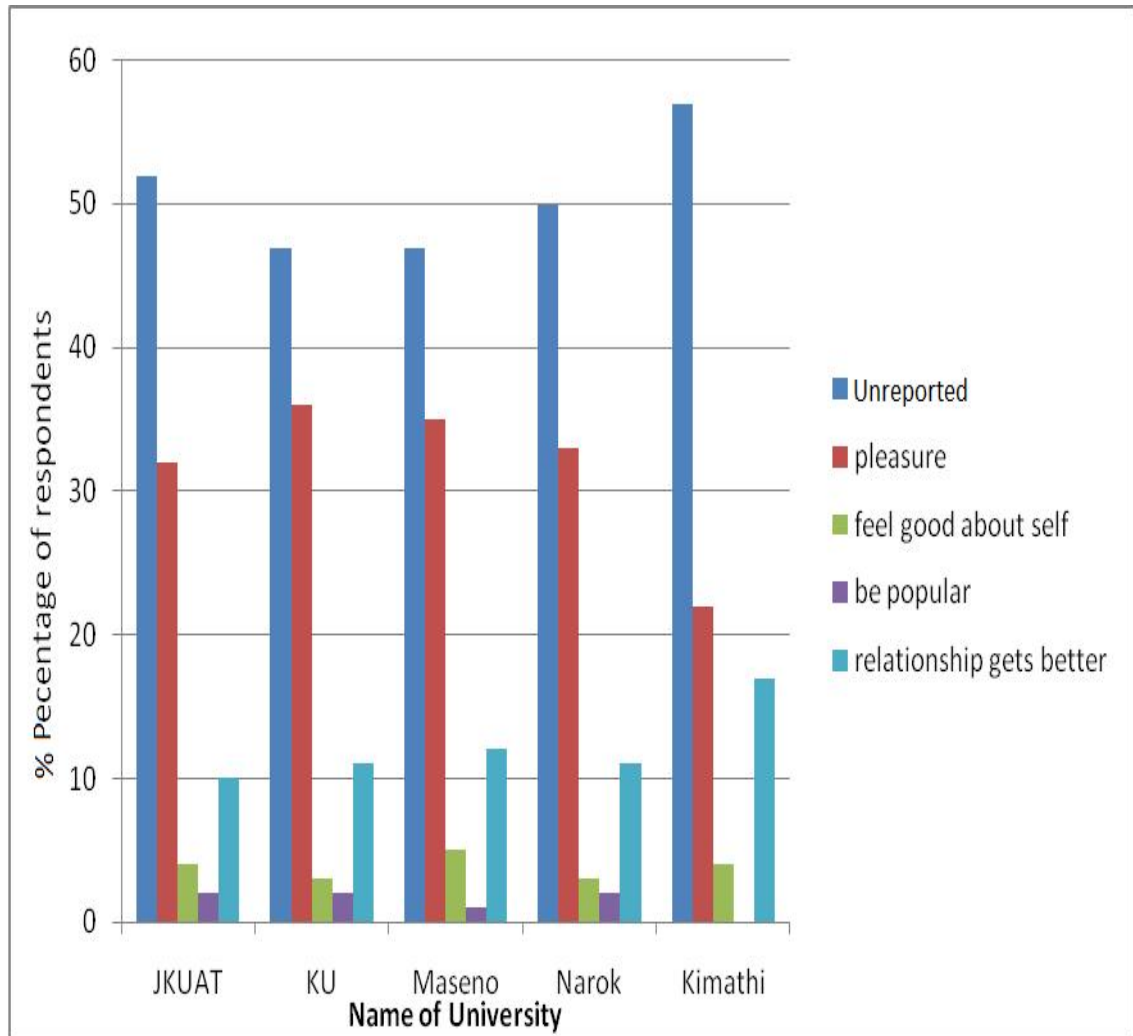


Figure 4.13: Type of sex risks among the respondents by University



#### 4.4.4 Reported sexual benefits among the study respondents

The findings revealed that 25% of the respondents thought sex was for pleasure while (4%-8%) reported that it is important in making relationship better or for one to become popular (4%) as shown in **figure 4.14**.



**Figure 4.14: Type of sex benefits among the respondents by University**

#### 4.4.5 Reported sexual motivation among the study respondents

Figure 4.15 shows that (42% -78%) of the students felt that substance abuse was a major motivator for them to have sex followed by attraction (35%-45%) and alcohol (15%-39%) in the universities.

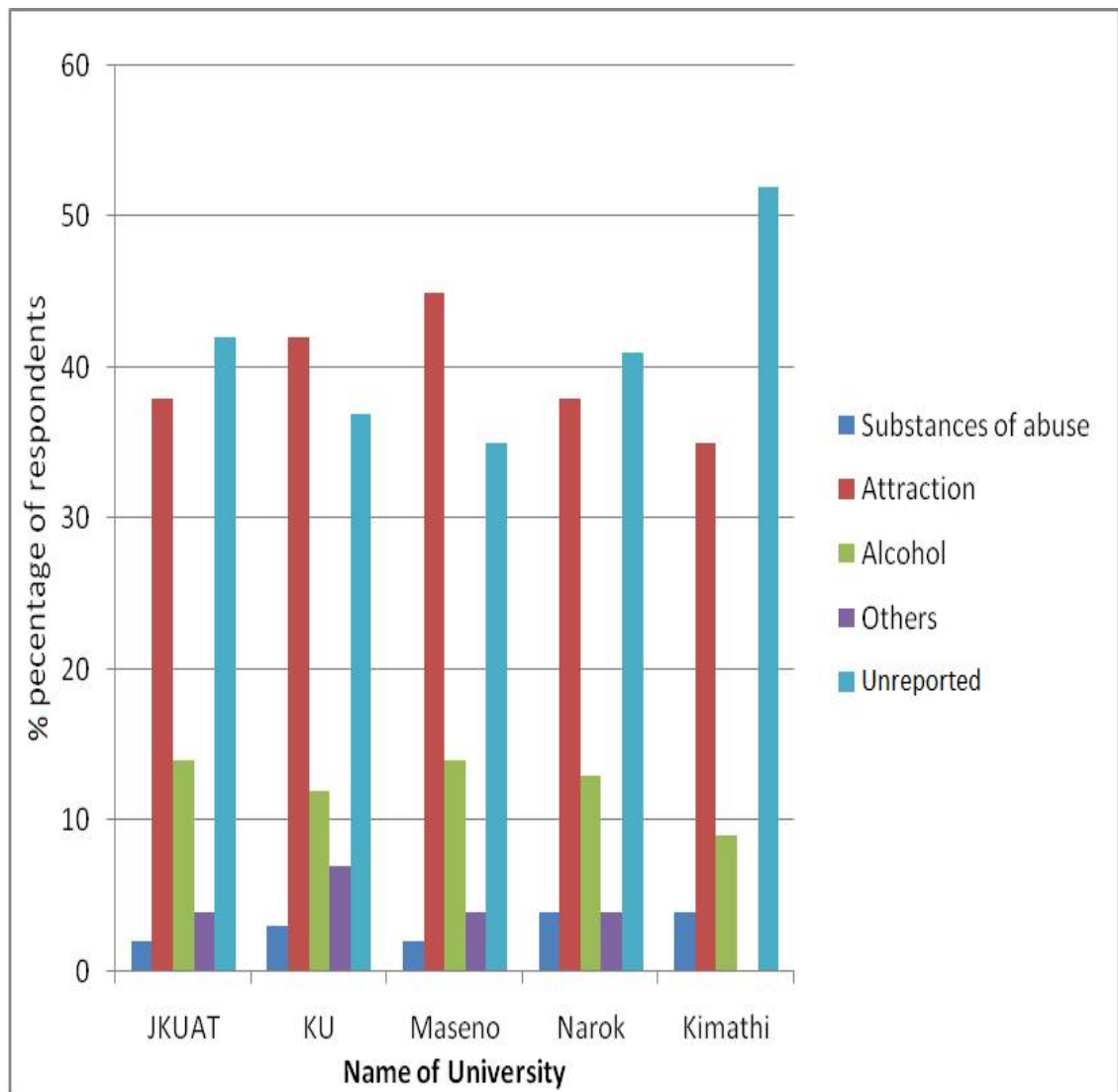
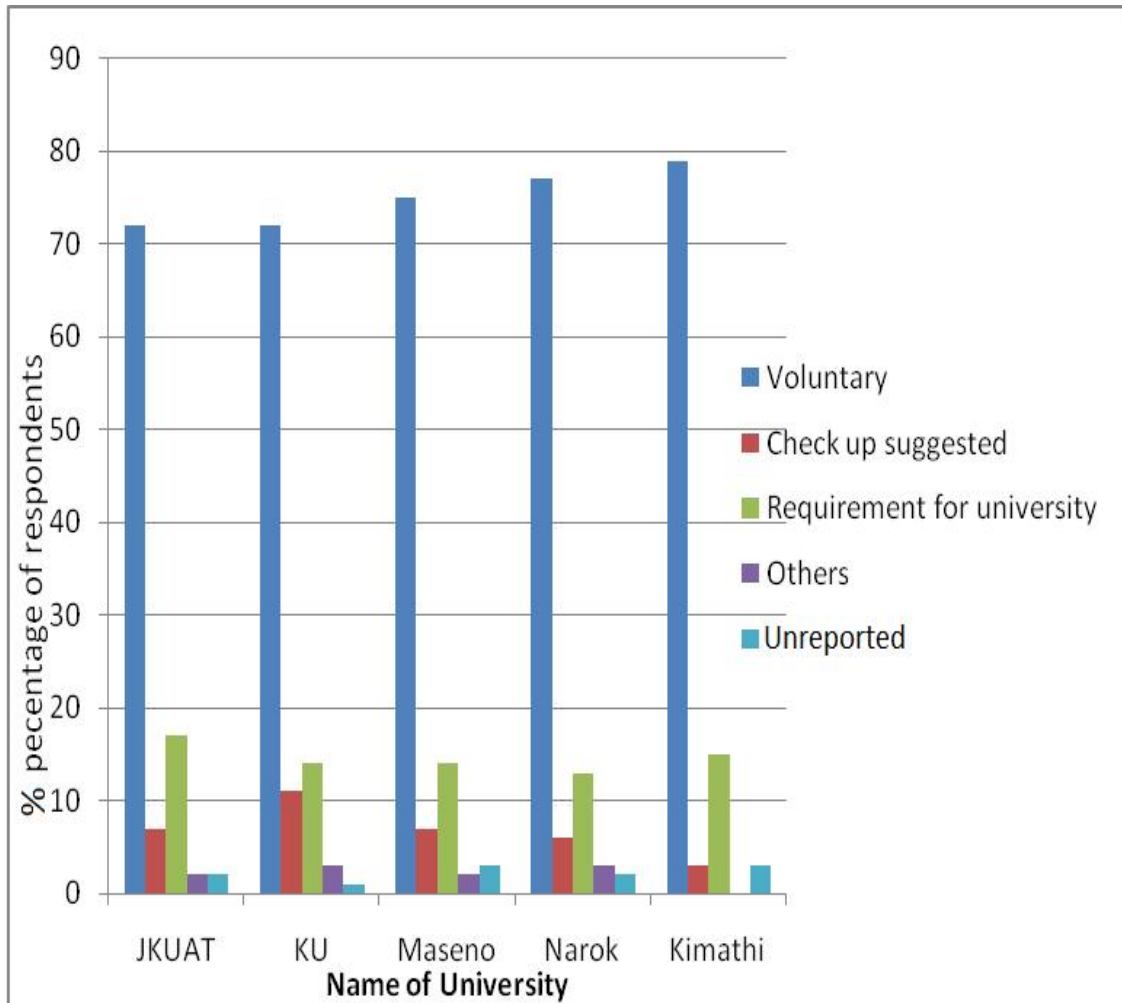


Figure 4.15: Factors leading to sexual motivation among the respondents

#### 4.4.6 Previous STI testing among study respondents

**Figure 4.16** indicates that (29%) of the students reported voluntary decision for STI testing, travel requirements (6%) and check up on medical advice (3%) as the reasons for STI testing.



**Figure 4.16: Reason for previous STI testing among university students**

#### 4.4.7 HIV/ STI testing services among study respondents

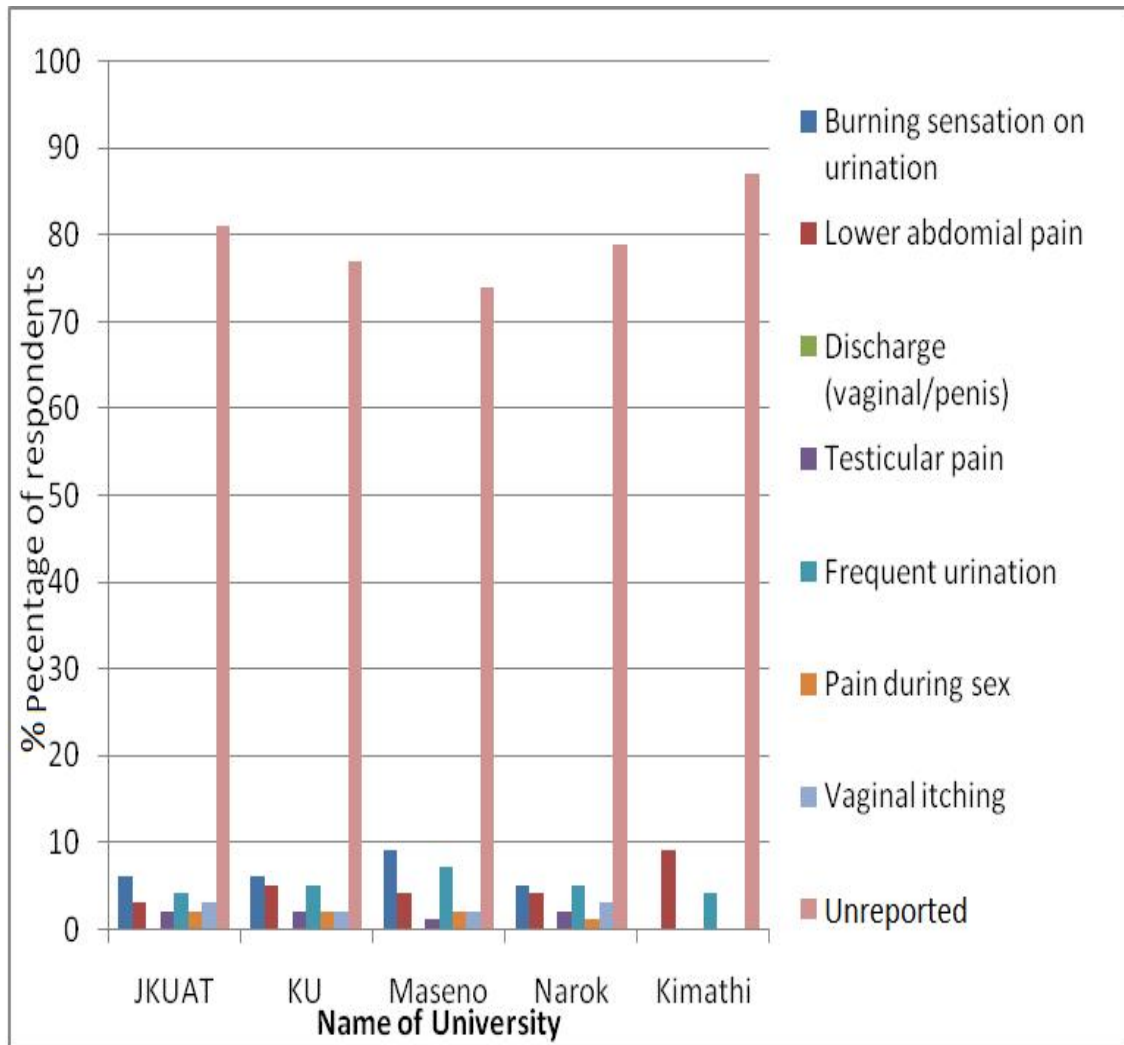
**Table 4.2** shows that (92%) of the university students had both HIV and STI testing and (8%) of those tested for STI did not have a HIV test in all the universities. Further, there was a significant association between HIV testing and STI testing P value <0.001.

**Table 4.2: HIV and STI testing among university students**

		Sought STI testing		Total	P value
		Yes	No		
HIV testing	Yes	92%	40%	61	<0.001
	No	8%	60%	39	0.08

#### 4.4.8 STI signs/symptoms experienced among the study respondents

**Figure 4.17** reveals (75-85%) had experienced STI signs and symptoms, burning sensation on urination (8%), frequent urination (7%), lower abdominal pain (6%) but vaginal/penile discharge, testicular pain, painful sex and itchy vaginal discharge comprised of below (2%).

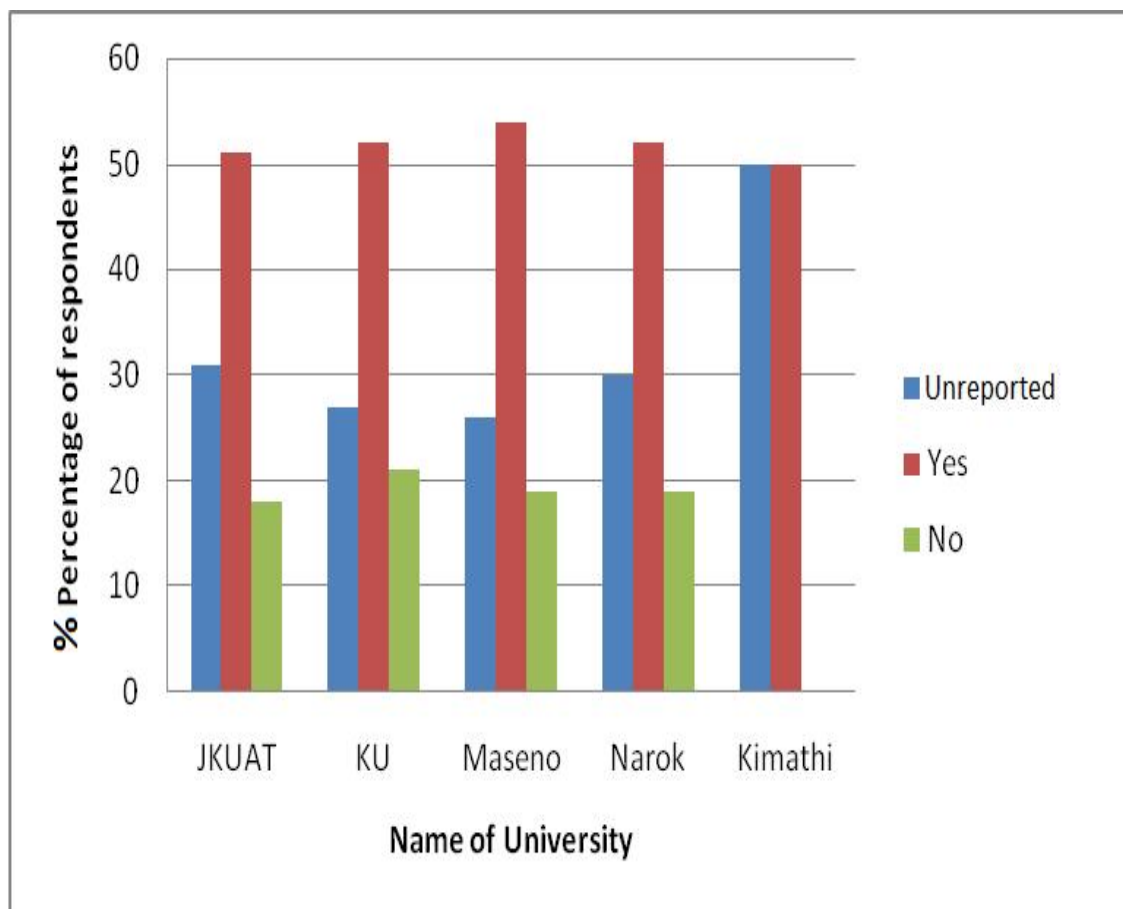


**Figure 4.17: STI signs/symptoms experienced among university students**

## 4.5 Predictors of condom use among the respondents

### 4.5.1 Condom use among the study respondents by university

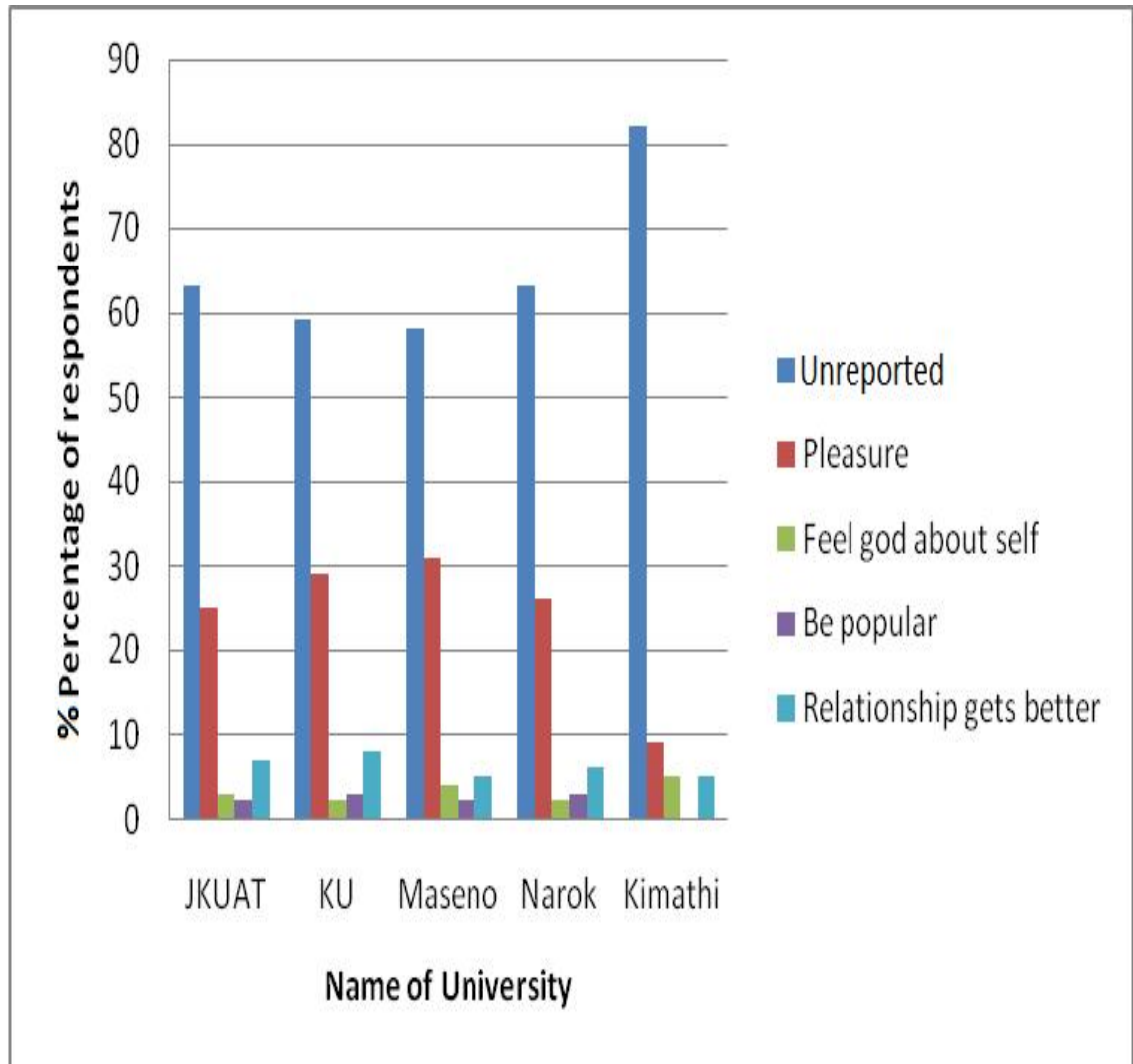
**Figure 4.18** shows that condom use was prevalent among the respondents at (80% -90%) across universities and approximately a quarter of the students in the universities never used condoms.



**Figure 4.18: Condom use among the respondents by University**

#### 4.5.2 Reported benefits of condom use by the study respondents

The sense of pleasure was revealed as a benefit of condom use among a quarter of the respondents and the relationship to be better at (15%) while (6%) of the students reported use of condom to be popular at the universities as shown in **Figure 4.19**.



**Figure 4.19: Reported benefits of condom use among the respondents by University**

### 4.5.3 Barriers towards condom use among the study respondents

Figure 4.20 shows the major barrier towards condom use as feeling of unnatural (70%), trouble (17%) and (8%) rely on partner cooperation among others.

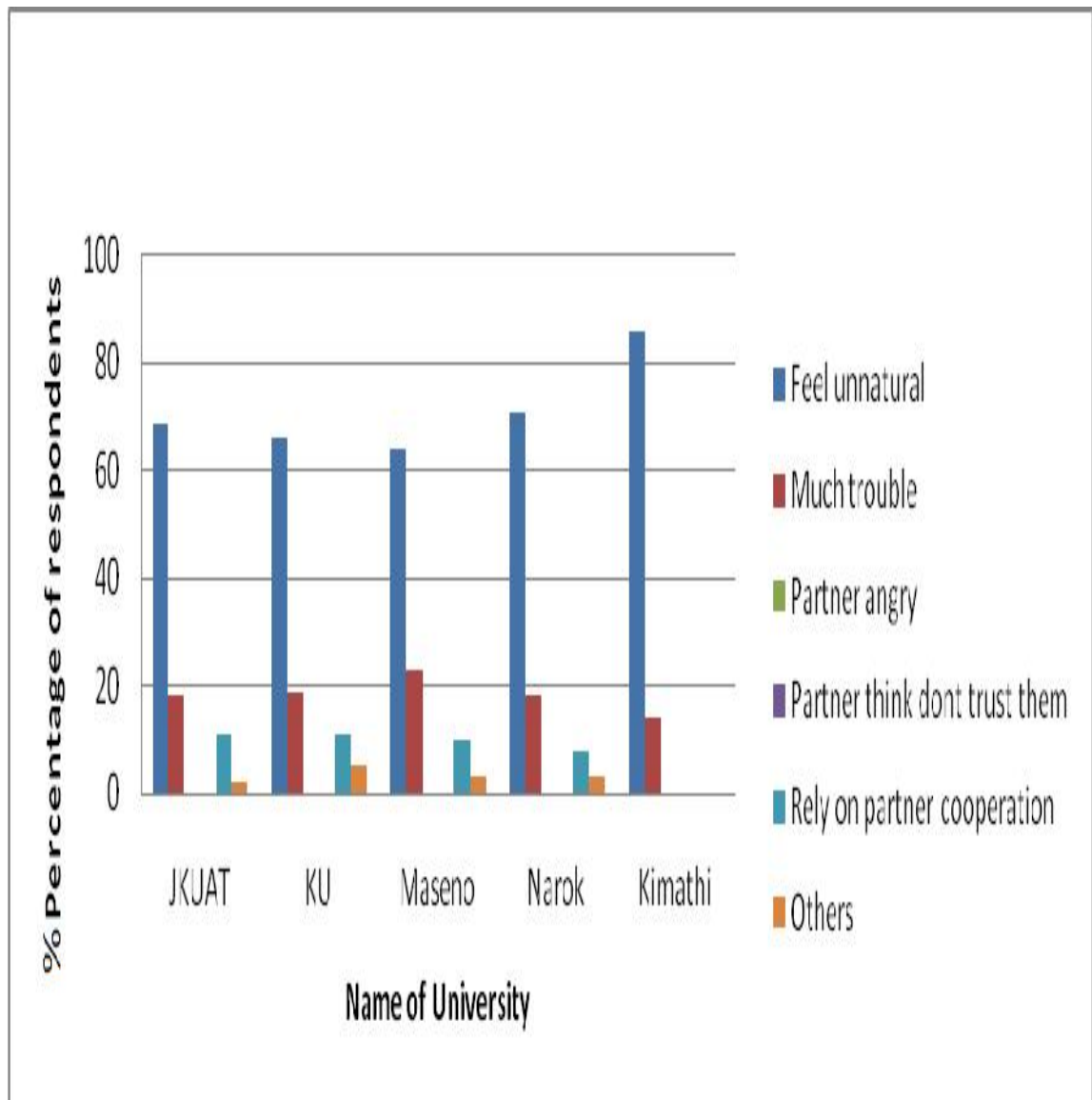


Figure 4.20: Barriers towards condom use among the respondents by University



#### 4.5.4 Source of condom among the study respondents

Figure 4.21 shows that (15%-40%) of the students reported that they obtained condoms from chemists though (25%- 50%) of students obtained from GOK clinics and (10-15%) reported availability at the university dispensers among others.

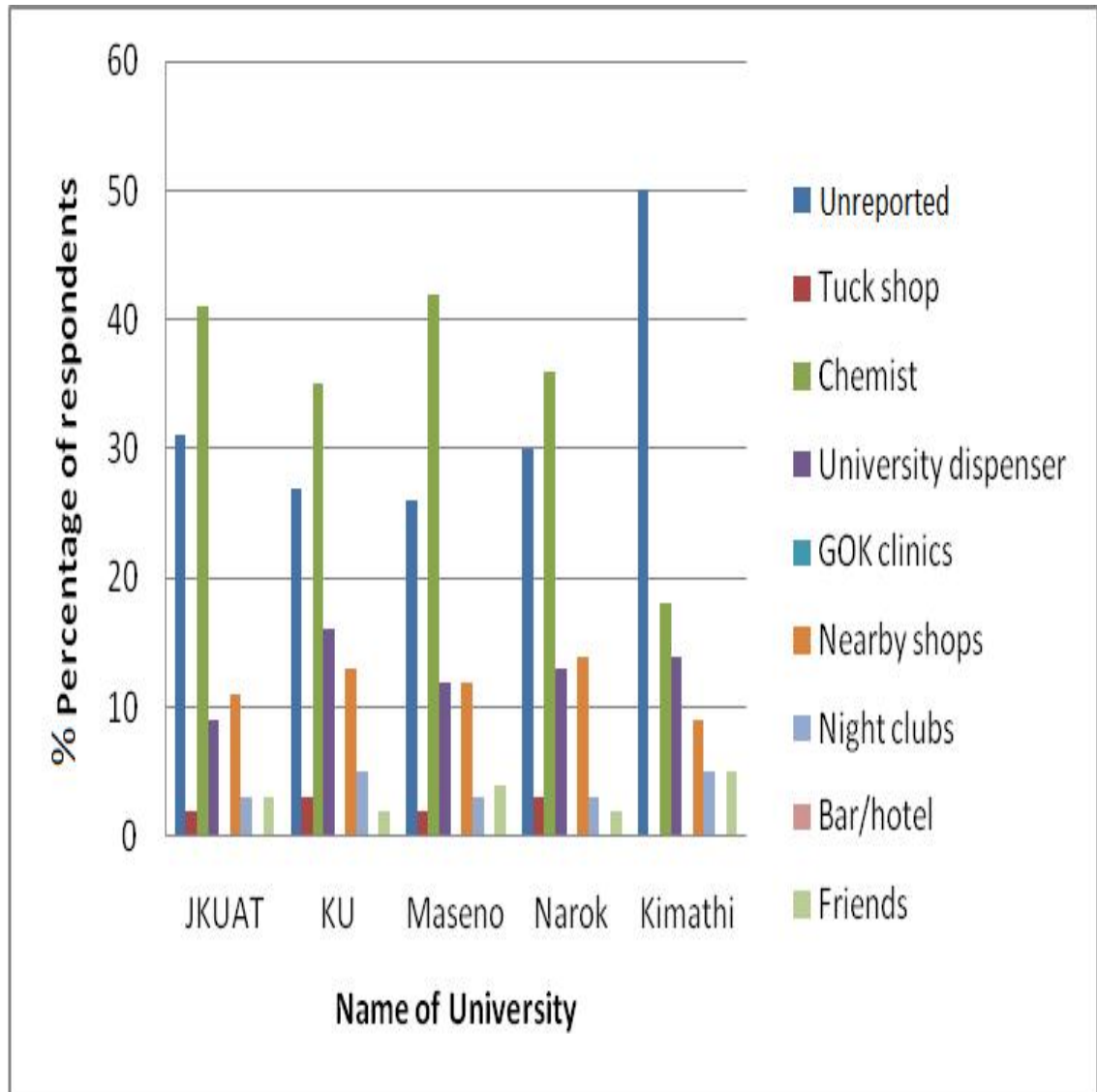


Figure 4.21: Source of condom by University respondents

#### 4.5.5. Association between substance abuse and alcohol among study respondents

**Table 4.3** shows that students who consumed 3-6 drinks were significantly ( $P < 0.001$ ) likely to report substance abuse by 5.23 times. Students who had increased alcohol consumption were unlikely to abuse substances while those whose consumption remained the same had insignificant association.

**Table 4.3: Multivariate analysis for substance abuse and alcohol use**

	AOR	Lower CI	Upper CI	P value
<b>Weekend alcohol consumption</b>				
1-2 Bottles(base)				
3-4 Bottles	5.23	3.29	8.3	<0.001
5-6 Bottles	5.39	3.4	8.55	<0.001
<b>Alcohol pattern</b>				
Decreased consumption(base)				
Increased consumption	0.47	0.32	0.69	<0.001
Consumption remained the same	0.95	0.65	1.38	0.79
<b>Most alcohol consumed</b>				
1-2 Bottles (base)				
3-4 Bottles	0.7	0.49	0.99	0.045
<b>Current drinking habit</b>				
1-2 Bottles (base)				
3-4 Bottles	0.62	0.49	0.78	<0.001

#### 4.5.6: Association between substance abuse and risky sexual behaviours among university students

Table 4.4 shows an association between substance abuse and other risky sexual behaviors except for the risks associated with sex.

**Table 4.4: Association between substance abuse and risky sexual behaviours**

Variable	X <sup>2</sup>	P value
Source of sex education	261.62	<0.001
Benefits of condom use	122.83	<0.001
Barriers to condom use	51.48	<0.001
Type of sex encounter	53.21	<0.001
Risks associated with sex	7.29	0.063
Benefits from sex	35.99	<0.001
Condom use	27.98	<0.001
Condom damaged	244.61	<0.001
Motivation before sex	105.49	<0.001
Tested for STI	273.89	<0.001
Tested for HIV	179.70	<0.001
Types of sex for STI transmission	164.04	<0.001
STI signs experienced	257.99	<0.001
Use substances of abuse	181.40	<0.001
Current drinking status	16.95	<0.001
Level of drinking	243.62	<0.001
Pattern of alcohol consumption	19.16	<0.001
Weekend alcohol consumption	85.65	<0.001

#### 4.5.7: Multivariate analysis of factors associated with substance abuse

##### 4.5.7.1: Socio-demographic characteristic as predictors of substance abuse among study respondents

**Table 4.5** shows that a reduced risk of substance abuse for students who lived in accredited hostel ( $P < 0.001$ ) and rented apartment ( $P < 0.001$ ) while those who had both parents alive less likely to abuse substance ( $P < 0.001$ ). The females were less likely to abuse substances ( $P < 0.001$ ). The increase of house occupants decreased the risk of substance abuse by 0.70 times (95% CI 0.67 – 0.74;  $P < 0.001$ ).

**Table 4.5: Multivariate analysis for socio-demographic characteristic as predictors of substance abuse**

	AOR	Lower CI	Upper CI	P value
<b>Residence</b>				
University hall(base)				
Accredited hostel	0.49	0.32	0.74	0.001
Rented apartment	0.63	0.54	0.72	<0.001
<b>Parents</b>				
Mother(base)				
Father	1.92	1.41	2.59	<0.001
Both	0.67	0.55	0.81	<0.001
None	1.39	1.01	1.9	0.042
<b>Gender</b>				
Male (base)				
Female	0.77	0.67	0.88	<0.001
Occupants	0.7	0.67	0.74	<0.001

**4.5.7.2: Association between substance abuse and source of sex information/ education among study respondents**

**Table 4.6** shows that students who got information from the church were significantly less likely to abuse substances  $P < 0.001$ . The students who reported not having seen STI/HIV posters were significantly more likely to abuse substances  $P < 0.001$ .

**Table 4.6: Multivariate analysis for substance abuse and source of sex information/ education**

		<b>AOR</b>	<b>Lower CI</b>	<b>Upper CI</b>	<b>P value</b>
<b>Sex education</b>	Parents(base)				
	Lecturer	0.71	0.54	0.94	0.016
	Peers/friends	1.38	1.12	1.69	0.002
	Health workers	1.05	0.78	1.41	0.751
	Church groups	0.3	0.21	0.42	<0.001
	Media	1.4	1.13	1.74	0.002
	Others	4.4	2.8	6.92	<0.001
<b>STI/HIV posters</b>	Yes(base)				
	No	1.43	1.2	1.7	<0.001

#### **4.5.7.3: Association between substance abuse and risky sexual behaviors among study respondents**

**Table 4.7** shows that students who were involved in receptive vaginal intercourse were significantly more likely to abuse substances  $P < 0.001$  while those who abused substances were more likely to have sex with a fellow student or strangers by 1.72 (95% CI 0.99 - 3.02;  $P = 0.056$ ) times and 1.97 (95% CI 1.13 - 3.42;  $P = 0.017$ ) times respectively. The students who reported substance abuse were significantly more likely not to use a condom by 1.95 (95% CI 1.52 - 2.50;  $P < 0.001$ ) times compared to those who reported condom use as the reference group. The study respondents who reported condom use for safety from HIV/STI as the reference group, reported condom benefit as safety from pregnancy and were less significantly likely to abuse substances (AOR 0.33; 95% CI 0.26 - 0.42;  $P < 0.001$ ). The students reported feeling unnatural as a condom barrier but those who reported partner mistrust were significantly less likely to abuse substances by 0.55 (95% CI 0.41 - 0.75;  $P < 0.001$ ).

**Table 4.7: Multivariate analysis of substance abuse and risky sexual behaviors**

		AOR	Lower CI	Upper CI	P value
<b>Type of sex</b>	Insertive vaginal intercourse(base)				
	Receptive vaginal intercourse	2.1	1.53	2.88	<0.001
	Insertive oral sex	1.17	0.72	1.88	0.533
	Non-penetrative sex	0.9	0.56	1.46	0.677
<b>Sex risks</b>	Get STI(base)				
	Get HIV	0.66	0.46	0.96	0.031
	Become pregnant	0.96	0.63	1.44	0.827
	Others	1.14	0.73	1.78	0.577
<b>Sex partners</b>	Lecturer(base)				
	Fellow student	1.72	0.99	3.02	0.056
	Others	1.97	1.13	3.42	0.017
<b>Condom use</b>	Yes (base)				
	No	1.95	1.52	2.5	<0.001
<b>Condom benefit</b>	Safe from HIV/STI(base)				
	Feel more responsible				
	Safe from pregnancy	0.33	0.26	0.42	<0.001
	Easily available	0.79	0.54	1.16	0.227
<b>Condom barrier</b>	Makes one unnatural(base)				
	Lack of partner trust	0.55	0.41	0.75	<0.001

## **4.6 Qualitative Findings**

### **4.6.1 Availability of HIV related policies and services at the universities**

Findings from the key informant interviews and administrators on the availability of HIV related policies and programs were summarized in **table 4.8**. The National Strategic Plan for HIV/AIDS prevention and control was considered a key guiding document for all HIV programs in universities. University administrators were asked about its availability and evidence for its use in policy formulation. Findings from the Key informants revealed that document was available in two universities (KU and JKUAT). Notably, two of the universities assessed (Narok and Maseno) did not have a written University HIV policy. All the universities had HIV preventive activities, Counseling and psychosocial support services and of a code of conduct for students.



**Table 4.8: Summary of key institutional frameworks for HIV planning and mainstreaming by universities**

<b>Availability of Item</b>	<b>KU</b>	<b>JKUAT</b>	<b>KIM</b>	<b>MASN</b>	<b>NARK</b>
HIV control policy	Yes	Yes	No	No	No
HIV National strategic plan	No	Yes	Yes	Yes	Yes
Monitoring plan document	No	No	No	No	No
Monitoring for HIV/AIDs	No	No	Yes	Yes	No
Information system for HIV	No	Yes	Yes	Yes	No
HIV coordination structure	No	Yes	Yes	Yes	Yes
HIV/AIDs budget	Yes	Yes	Yes	Yes	Yes
Code of conduct	Yes	Yes	Yes	Yes	Yes
HIV prevention control plan	No	Yes	Yes	Yes	No
Preventive activities	Yes	Yes	Yes	Yes	Yes
Counseling support services	Yes	Yes	Yes	Yes	Yes
HIV mainstreaming	No	Yes	No	Yes	No

#### **4.6.2 Focused Group Discussions**

The respondents from the four FGDS revealed that those who abused substances felt that they would be in a social mood in parties. The respondents noted;

*You feel nice, relaxed like you can do anything and experimented to feel in place with peers*

*Others were curios after observing the actions of peers at the universities*

A FGD in KU revealed that alcohol was used to improve self-confidence and interact freely. A respondent noted;

*When you abuse substances, you become energetic, very influential in sexual feeling and this lead to sexual intercourse*

The students abused substances to perform sex better. Respondents from one FGD reported that;

*Males intoxicated substances in girls drinks to make them feel so nice and think about nothing and men took advantage in sexual intercourse*

One respondent from JKUAT explained the difficulties experienced in attempt to put on a condom under the influence of substances.

*When you are high during sex you don't know what is happening and you might not use condom*

Approximately (64%) of the respondents were sexually active as they engaged in sex at the university. Some participants (24%) reported to have had their first sexual encounter at the university. The respondents from one FGD observed that;

*Sometimes having sex with more than one person and substance abuse can occur in the hostels*

Respondents from all the FGDs reported that, students engaged in multiple sex partners as it was fun and this was common and monogamous relationships were uncommon. Some students had sex with their friends as well as persons whom they did not know in their residential rooms. One respondent noted;

*You see ladies want more than one man for money and upkeep and they don't care about HIV*

All respondents from the FGDs noted that students had high risk behavioral patterns characterized by unprotected/unsafe sex, frequent night clubbing and substance abuse. The female respondents from one FGD reported that, girls had sex for money to enable them live in the latest styles and fashion.

It was further reported by the respondents that, there was a growing trend for girls to have sex with older men to get certain amenities. The men had sex with many females for competition and to feel they were real men and shared this with colleagues to gain a status. The respondents reported that peer pressure motivated sexually active to engage in sex. Some female respondents were pressurized by their males' friends to have sex. Some respondents reported that;

*I really didn't want to do it (have sex) but the forced me. He pleaded until I became fed up then I gave him*

At the universities respondents were being ridiculed by their friends for not having sex. This act was common among the males and had a negative impact as respondents had to avoid embarrassment from peers. However, this appeared to be more of an issue for males. Respondents from two FGDs reported the following;

*Experimentation for sex was common as students were curious hence the desire for sex experimentation*

*I just wanted to try it to see what it was like*

A female respondent noted;

*I had sex and it was sweet and you can see for yourself*

The electronic media, sexy material, music and entertainment influenced students into sexual behavior. A respondent reported that;

*It's a known fact of the advertising industry that sex sells. I think that face book and internet influence the students on sexual behavior*

The respondents revealed that love and trust were main reasons for lack of condom use

but females thought they would disappoint their boyfriends if they emphasized on condom use. One female respondent noted;

*He was tested for HIV last month before we had sex so no need for a condom*

The men dictated on lack of condom use and students reported a greater sexual satisfaction without the use of a condom. A male respondent noted the following;

*My friends say that it does feel better when you don't use protection but does not give you sensation,*

*Let flesh meet flesh*

*It does burn*

The specific institutional arrangements varied by university and some best practices were noted from KU as the administration had assigned an office for HIV coordination. This office implemented counseling, organized HIV testing camps on a regular basis, in association with the AIDS information centre. At KU regular student's counseling and Voluntary Testing and counseling (VCT) camps were organized.

The specific programs for HIV/STI and substance abuse awareness were implemented by University clinic.

The respondents revealed involvement in many activities and networks, which were similar across all universities even though there were a few unique situations to particular universities. Across all universities, the following were listed; cultural associations, faculty based associations and students clubs.

The respondents networks mobilized them to take up the religious services, HIV/STI activities, counseling, social support like the case of JKUAT and KU university peer educators.

### 4.6.3 Key Informant Interviews

The university staff involvement in HIV/STI related activities was investigated by interviewing the Key informants. They reported lack of direct involvement by university staffs in most substance abuse HIV/STI and activities but were involved in HIV activities in their designated scope of work. Some respondent observed the following;

*The academic staff provides lectures and HIV/STI issues only if the subject to be discussed contain HIV/STI awareness and prevention messages*

*During orientation weeks for fresh students in most Universities or part of the HIV and substance abuse content of the course being taught*

The JKUAT HIV policy stipulated prevention services within the university. The university had an active condom distribution programs.

The majority of respondents mentioned that staffs were involved in substance abuse and HIV activities but at minimal levels.

Some respondents at Kimathi had the following to say;

*The academic staff members are developing a policy on HIV/AIDS care and support for students who are HIV positive and together with the non academic staff we sit and formulate the HIV/AIDS workplace policy for Kimathi.*

Some respondents at KU and Maseno observed;

*We sensitize students on HIV/AIDS issues, counseling for psychosocial support*

At Maseno and Narok respondents noted the following;

*Lecturers teaches HIV courses in the universities and the community*

*Student peer educators effective programme has helped to breakdown the taboo on discussing HIV/AIDS at the university.*

There were variations in feelings on the magnitude of risk behavioral patterns by the Key Informants from the different universities as evidenced by following statements from the KU, Maseno and JKUAT;

*The behavior of students at this university is that, you find students living together.*

*Female students visit bars and brothels regularly in the evening and over weekends*

The respondents revealed the following reasons for risky behavior among youth in the Universities.

*Students were vulnerable, particularly due to the community surroundings and groups association.*

*There were higher levels of freedom and pleasure in the universities with readily available, low priced and accessible substances.*

*The Key informants reported that students were well educated about HIV/AIDS although some youth were in denial regarding the likelihood of contracting the virus.*

*They are carefree to prevent themselves from HIV when having fun and become infected as they don't worry about HIV*

*Students engaged in risky sexual behavior when under the influence of substances and this interfered with the thinking ability according to one chairman of a department.*

The factors that contributed to contraceptive use in the Universities included increased substance abuse, lack of legislation or policies on condom use and distribution. The respondents were not aware of whom they were having sex with and did not give any consideration to protection. In this study counseling, education on HIV/AIDS testing on a regular basis was implemented especially at KU where counseling student's camps were organized. The specific awareness programs for substance abuse and HIV/STI were implemented by University clinics. The respondents reported;

*Major obstacles are lack of funds to implement suitable intervention strategies and lack of support from other sectors that do not perceive a correlation between their organizations and the issues of HIV/AIDS.*

## CHAPTER FIVE

### 5.0 DISCUSSION

This study yielded important findings to determine the prevalence and types of substance abuse among students though (62%) of the students had a mean age of 24 years in contrast to Brazil where 58.9% of university students aged 16 years (Moser *et al.*, 2007). This difference could be attributed to the rigors of academic pursuit and the need to excel (Ajuwon *et al.*, 2006). The findings differed with that of Jimma University in Ethiopia and Eldoret College in Kenya where the student's mean age was 22.3 years and 22.9 years respectively (Lukoye *et al.*, 2011). The gender was almost equal in all the universities and this concurs with findings from an Eldoret college that revealed a proportion 52.2% among females (Lukoye *et al.*, 2011) in contrast to Jimma University 71.3% for males.

However, the proportion of female respondents was higher at Narok but KU ration between genders was equal a reflection of the recent university admission policies on female's affirmative action. The students who rented private accommodation comprised of (55%) though (45%) resided in the university halls across all universities. At both KU and Narok (6%) of students resided in accredited hostels and this conforms with an Ethiopian study that revealed limited accommodations and this contributed to risky sex, substance abuse and peer pressure in colleges ( Mitike *et al.*, 2002).

In the current study, alcohol and cigarettes were the commonly abused substances in all universities with a high proportion of students at JKUAT (20%) and (7%) respectively, marijuana (5%) smokeless tobacco (4%) and stimulants (3%) in contrast to findings from a Columbia University where 33.3% of the students abused marijuana, hallucinogens and Switzerland findings revealed cannabis abuse (Howard & Wang, 2004). The medical students at the university of Illorin Nigeria found the commonly abused substances stimulants 33.3%, alcohol 13.6% sedatives 7.3% and tobacco 3.3%

(Afred *et al.*, 2004). Findings from Maseno University students found alcohol (12%), miraa (11%) and marijuana at 7% as the commonly abused substances (Winga, 2005) but Iranian students had a high incidence (Mohammadpoorasl *et al.*, 2007). Based on the current study, it was notable that (35%) of the students abused substances to feel nice, relax and experimented to feel in place with peers in the Kenyan universities. This information can be useful in devising effective interventions and measures for preventing substance abuse among university students in Kenya. In the current study, there was significantly reduced risk of substance abuse for students who lived in accredited hostel and rented apartment, this concurs with findings from an Ethiopian study where student's age, living out of campus and substance abuse were risky sexual factors among Jimma university students (Gurmesa *et al.*, 2012).

Findings from a study in Kaunas, Lithuania indicated that sex and residential factors were associated with substance abuse (Garmiene *et al.*, 2006). The studies among medical students in Calcutta showed that substance abuse was prevalent among hostel dwellers. The parents and family members have an impact on children's choices on substance abuse.

In this study, students who had both parents alive were significantly less likely to abuse substance by 0.67 times. This concurs with another study where children brought up in two-parent homes were at a lower risk for substance abuse hence parents influences children's substance abuse ( Kumpfer and Alvarado, 2003). The students who had only the father or none of the parents significantly had high risks of substance abuse by 1.92 times compared to those who had only a mother.

In Kaunas, Lithuania revealed that parents who communicated to their youth were less likely to begin using alcohol in adolescence (Garmiene, 2006). The current study findings indicate that females were less likely to abuse substance by 0.77 times. This compares with Michigan University findings that reported earlier, longer and a higher frequency of substance abuse among male than female students (Johnston *et*



*al.*, 2004). This study established that for every increase of occupants in the house there was a significant decrease in the risk of substance abuse by 0.70 times. The findings were different from a Canadian study where over 37.4% of youth stayed in a household where a parent or other adult abused substances. This information can be useful in devising effective interventions and measures for preventing substance abuse among university students in Kenya.

In the current study condom use was prevalent at (50% -54%) among the university students compared to (78%) and (90%) found in Ghana and Kampala respectively (Asante, 2013). This was probably because at the time of the study in Uganda, the HIV prevalence was high making more people more aware of HIV.

In the current study HIV/STI risky sexual behaviors were established where students revealed love and trust as the main reasons for lack of condom use and females thought they would disappoint their boyfriends if they emphasized on condom use. This concurs with findings from Ghana where students had inconsistent condom use in stable relationships due to trust (Tagoe and Aggor, 2009). In America findings showed that sexually active students used condoms during (ACHA, 2012).

In this study males dictated on lack of condom use and it was believed that greater sexual satisfaction was achieved without the use of a condom. The college students have had low rates of consistent condom use. Also in the study the factors that contributed to contraceptive use among respondents in Universities included increased HIV and substance abuse education, increased demand for condoms, lack of legislation or policies on condom use and distribution. This is supported by the fact that in the public sector condoms are provided without charge through MOH facilities, community-based distributors (CBDs) and non-governmental organizations (NGOs), as well as through bars and lodgings. One-quarter and 15% of the public sector condoms are distributed through dispensers and social

marketing respectively. The policies are further designed to ensure that the country can gradually move toward sustainable condom supply (NASCO, 2005).

In the current study students who reported substance abuse were significantly likely not to use a condom and these results concurred with that of Jimma university where students who abused substance were three times more likely to ever have had sexual intercourse (Gurmesa *et al.*, 2012). In contrast, a Columbia study revealed association between substance abuse and lower condom use among the youth) and substance abuse was the reason for risky sexual behavior (ACHA, 2012).

In this study, university students who reported safety from pregnancy as a condom benefit were significantly less likely to abuse substances. The consistent condom use depends on student's age, risk perception, beliefs about HIV/STIs and life experiences (Brewer *et al.*, 2004). In the current study, students who reported that their partners thought they never trusted them were significantly less likely to abuse substances by 0.55. The findings also indicated a significant association between condom barriers, pregnancy and partners trust. Having unprotected sex with a casual partner increased the odds of STIs exposure and unwanted pregnancy (ACHA, 2012). In the current study, respondents who reported easy availability of condoms and feeling responsible as benefits had no significant association  $P > 0.05$  with condom benefits in contrast to a S.A study where condoms unavailability during sexual interactions was the reason for non-use (PAI, 2002).

The condom use was prevalent among the current study respondents (50% -54%) but approximately 18% never used condoms, this compares with a study in Ethiopia where (37.1%) of sexually active medical students used condoms (Fitaw and Worku, 2002) and in Ghana students inconsistently used condoms due to trust (Tagoe and Aggor, 2009). The current study findings revealed the feeling of more responsible as a benefit of condom use and was common among the respondents at (50%-55%) but in Ethiopia (32.7%) of university students had used condoms during their first sexual encounters (Tariku *et al.*, 2012).

In this study the HIV/STI protection as a benefit of condom use was (22-50%) and condom availability (10%) in contrast with (6%) from Madagascar where students used condoms consistently in the last 12 months citing steady partners and decreased pleasure (Rahamefy *et al.*, 2008). In contrast findings from Washington revealed trust in one's partner as a barrier to condom use (Longfield *et al.*, 2002).

In the current study (15-40%) of the respondents obtained condoms from chemists though (25-50%) obtained from Government of Kenya (GOK) clinics. In Brazil a decrease in condom prices led to a high purchase and increase in condom availability in SA led to increased uptake (Policy Project, 2004). There is limited condom distribution systems leading to inaccessibility. In the current study obstacles reported due to condom unavailability were lack of funds to implement suitable intervention strategies and lack of support from other sectors that do not perceive a correlation between their organizations and the issues of HIV/AIDS.

Some of the best practices were noted at KU that assigned an office for coordination of HIV related activities. The minimal effects of the existing advocacy methods for condom use interventions do not incorporate mechanisms to control existing condom use barriers. Findings from this study had important implications for Universities education and prevention of HIV/ STI and substance abuse perpetuation. The pattern of substance use was reported among youth in Kenya, where lifetime and current substance use was 74% and 83% respectively (Embleton *et al.*, 2012). The university efforts to reduce substance abuse consequences among college students need to be designed.

Findings from this study revealed that (42% -78%) of the students felt that substance abuse motivate them to have sex followed by alcohol (15%-39%). The ACHA estimated that 15% of college students who drank alcohol had unprotected sex while 30% of students report drinking prior to sexual activity (Brown and Vanable, 2007). The findings from a Bolivian study indicated that adolescents who have had used alcohol or marijuana were likely to engage in sex (Lelinneth *et al.*, 2006). The substance abuse and alcohol coupled

with sexual activity is an additional reason that college students are considered at a higher risk for contracting HIV (Gullette & Lyons 2005; Lewis *et al.*, 2009).

The current study findings revealed a drinking rate of (68%-90%) among university students and this compares with Substance Abuse and Mental Health Services Administration (SAMHA) findings in the US among college students where the rate of alcohol intake was 43.5% (SAMHA, 2010). The findings of this study are in contrast to another US study where 22.7% of full-time college students abused substances (SAMHA, 2010).

In a Harvard School of Public Health Alcohol Study (1999) alcohol intake decreased among dormitory residents unlike for students who lived off campuses. This might have been as a result of increased administrative efforts to restrict drinking on campus (Vicary and Karshin, 2002). The rates were high in residence halls and students who lived independently off site in apartments drunk less. According to findings from a study in Egypt indicated a substance use prevalence of 62% with alcohol consumption at (35%) with 3% indicating injection drug use (Hadesse *et al.*, 2013). In this study the pattern of alcohol use was (8%-14%) in all the universities but KU, Kimathi and Maseno had a decrease in alcohol consumption. In the current study students who consumed 3- 6 drinks over the weekend significantly abused substances.

In this study, there was significant association between substance abuse and alcohol P <0.001). The students who drunk 3 - 4 bottles were likely to report substance abuse by 5.23 times and 5.39 times respectively compared to those who drank 1-2 drinks. Similarly, an American study noted (10%) of American youth consumed drugs and alcohol (SAMHA, 2010). At Kimathi (90%) of the students revealed to have consumed 3-4 beers over the weekend while alcohol consumption in a Kenyan study was at (35%) with 3% indicating injection drug use (Hadesse *et al.*, 2013).

The pattern of alcohol use among students who reported that alcohol consumption remained the same or decreased at (10%) and this never varied significantly in all the

universities as Kimathi had a decrease at (5%). In all the universities (40%) of the students moderately consumed alcohol but (10%) of them were heavy consumers unlike Kimathi that never had light consumers.

In all universities (35%) of the students abused substances but (65%) were non consumers in contrast to a Taiwan study that found 66% of students abused substances (Avants *et al.*, 2000) and consumption of 4-5 drinks was associated with risky sexual behaviors (Hingson *et al.*, 2002). This is in contrast to the findings of this study where (15%) of students in all the universities consumed 1-2 beers and (8%) consumed 3-4 beers. In Southern state University (80%) of college students aged drunk alcohol and (40%) had a heavy drinking in the previous 2 weeks (Johnston *et al.*, 2004; Naimi *et al.*, 2003).

There was association between substance abuse and HIV/STI risky sexual behaviors with a significant association between pattern of alcohol use, level of drinking and other substance abuse  $P < 0.001$ . The alcohol availability in halls and advertisements on and off-premise establishments were also associated with higher alcohol consumption (Kuo *et al.*, 2003). Alcohol use reduces the odds of using barrier protection against STIs (Cooper, 2002).

In the current study (50%) of the students preferred receptive vaginal sex, insertive vaginal (30%) and insertive oral (15%) while students in California engaged in oral sex and insertive anal (6%) respectively (Halpern-Felsher *et al.*, 2005). The Canadian and Nigerian study findings indicated that 78% of undergraduates had penetrative sex (Stinson, 2010) and compares with Madagascar findings of 80% with steady partners for decrease of pleasure (Rahamefy *et al.*, 2008).

Findings from this study showed that (64%) of the respondents were sexually active as they engaged in sex at the university and this compares with Madagascar and Nigerian University students who had a sexual experience of 80% and 76.8% respectively (Rahamefy *et al.*, 2008; Okafor & Obi, 2005). This could be because of cultural difference

in relation to sexual activity between the two countries and Kenya. Some respondents (24%) reported to have had their first sexual encounter at the university in contrast to Hispanic college students who engaged in HIV high-risk behavior (Polacek *et al.*, 2007).

Some students had sex with their friends and strangers in their residential rooms and this conforms with findings from undergraduate students in Uganda where risky behaviors were prevalent among campuses dwellers (Agardh *et al.*, 2012). Findings from the current study indicated that, men had sex with many females to feel that they were real, experimented for sex and were curious and this compares with Enugu findings where curious undergraduate students had sex and substances abuse experimentation (Okafor & Obi, 2005). In the current study students engaged in multiple sex partners due to fun and monogamous relationships for certain amenities and never cared about HIV while (80%) of USA college students reported more than 2 sex partners (Lewis *et al.*, 2009).

Also this study revealed that there was a growing trend for girls to have sex with older men to get certain amenities. The Kenyan findings indicated that living on campus offered some protection against too early sex as a result of mobility (LVBC/EALP, 2010). The males had sex with many females for competition, to feel they were real men and shared this with colleagues to gain a status. This concurs with USA findings where most college students had multiple sex partners (Lewis *et al.*, 2009).

However, findings from the current study indicated that the perceived risk of acquiring HIV/STI differed significantly across the selected Kenyan Public Universities. This differs from findings of an urban university students in the US who considered themselves at low risk of contracting HIV (Lewis *et al.*, 2009) and Kwazulu Natal where the youth were also at a risk (Laksmana, 2003).

In this study the highest prevalence (17%) of perceived risk was observed at Maseno University and this concurs with USA student's findings as students considered themselves at risk for HIV and a larger percentage engaged in HIV risk-behaviors (Brown & Venable 2007; Lewis *et al.*, 2009). In the current study the prevalence of perceived risk in both

JKUAT and Narok was (14%) respectively with condom use being prevalent at (50% - 54%). In the current study respondents perceived their risk for HIV as low and this concurs with a Nigeria study in Ibadan where the youth were less likely to reduce their risks of HIV/STI infection (Adegoke, 2003).

These findings have HIV policy implications and should be of grave concern to Kenyan universities. Maseno University had a HIV policy that stipulated prevention services and had an active condom distribution programs. Various administrators mentioned that staffs were rarely involved in substance abuse and HIV activities. The university staffs were involved in HIV activities in their designated scope of work provided the HIV/STI awareness and prevention message but at Kimathi they were developing HIV/AIDS policy. According to UON HIV/AIDs policy (2003) the University's initiative on HIV/AIDS policy addresses impact of HIV/AIDS on the workplace for students and the entire society. In the current study, approximately (78%) of the students revealed availability of STI/HIV posters in the Universities in contrast college students are very knowledgeable about HIV yet still practice high risk behaviors (Lewis *et al.*, 2009).

In this study (37%) of students received HIV/STI information from peer/ friends, (28%) media, (17%) parents and (18%) from lecturers, health workers among other sources. In Nigeria the major source of HIV/AIDs information among undergraduates was from radio and television hence HIV/STI knowledge is an important tool for fighting the epidemic (Ajayi and Omotayo , 2010). However, the results differed with those obtained in similar studies in North West Ethiopia which reported knowledge from television at 46.7% (Albrektsson *et al.*, 2009). Also the electronic media, sexy materials, music and entertainment especially the face book and internet influenced students into sexual behaviors.

Findings from an Indian study and Columbia university showed that pornographic films was associated with risky sexual behaviors, parental education and communication (Rahamefy *et al.*, 2008; Hutchinson *et al.*, 2003).

The findings from this study revealed a significant association between church groups and other sources of information in regard to HIV information and substance abuse. Also insertive vaginal sex (77%) was revealed as the main route of HIV/ STI transmission in the Universities though (17%) revealed receptive vaginal sex. However, there existed a disparity between the HIV/AIDS knowledge and practices. Findings from S.A h revealed limited experience and skills on condom use among the youth (Dolan & Niven, 2005).

The findings from this study revealed that (92%) of the students accessed HIV/STI testing in all the universities. The students at university of Pretoria failed to be tested for HIV yet they were knowledgeable about it (Opt and Loffredo, 2004).

There was a significant association between HIV testing and STI  $P < 0.001$ . The students revealed to have ever had experienced STI signs and symptoms comparatively with an India study where 70% of the students were familiar with the STIs signs and symptoms (McManus & Dhar, 2008). In the current study, burning sensation on urination accounted for (8%), frequent urination (7%), lower abdominal pain (6%) while in America (2%) of college students had genital warts–human papilloma virus (ACHA, 2008).

Substance abuse coupled with sexual activity is a reason that college students are considered at risk of HIV (Gullette & Lyons 2005). In this study substance abuse at (42% - 78%) and alcohol at (15%-39%) were major factors associative with sex among the respondents and this concurs with an American study where alcohol-related sexual behavior was common among college students (Lewis *et al.*, 2009). In Addis Ababa, substance abuse among the youth increased the risky sexual behaviors (Seme *et al.*, 2005) but in this study the respondents deliberately abused substances to perform sex better as males intoxicated substances in girls drinks and took advantage. The findings from the US college students indicated that students engaged in unprotected sex as a result of drinking (ACHA, 2010).

Also in Brown University students who used alcohol had unprotected sex (Kiene *et al.*, 2009). In contrast, findings from Kathmandu college students revealed association between alcohol consumption and cigarette smoking with risky sex (Adhikari, 2010). In



the current study substance abuse was significantly associated with receptive vaginal intercourse.

In this study KU and Maseno female students visited bars and brothels regularly in the evening and over weekends. The Ethiopia findings indicated that students who attended a night club and abused alcohol were more likely to have had sexual intercourse (Gurmesa *et al.*, 2012). Findings from the Africa's campus life study showed a high prevalence of sexual experimentation, unprotected casual sex, multiple sexual partners and prostitution among students (Katjavivi and Barnabas, 2003).

It was indicated that students were vulnerable, due to freedom and pleasure in the universities with readily, low priced and accessible substances. The findings from other studies indicated that college students were not concerned about HIV infection (Opt *et al.*, 2004). In this study the students were not aware of whom they had unprotected sex with and some were curious on alcohol use to improve self-confidence during sex. In contrast, 15% of college students who drank alcohol had unprotected sex while 30% of students report drinking prior to sexual activity (ACHA, 2012; Brown and Venable, 2007).

The students who abused substances reported lack of condom use. In Kwa Zulu-Natal South Africa 15% of sexually active students had abused substances during their last sexual intercourse (Reddy *et al.*, 2003). In Tanzania universities students who lived outside university campus or at the university hostel outside university campus had higher risks of HIV than those who lived with guardians (Abu *et al.*, 2010).

In the current study some female participants were forced or pressurized by their males' friends to have sex. The university students had risky behavioral patterns characterized by unprotected/ unsafe sex, frequent night clubbing and substance abuse. According to Lewis, substance abuse and alcohol affect sexual decisional making (Lewis *et al.*, 2009).

## **CHAPTER SIX:**

### **6.0 CONCLUSIONS**

1. There was a high prevalence of substance abuse and perceived risks due to pleasure and making relationship better. The commonly abused substances were alcohol and cigarettes with a small proportion of students taking marijuana and smokeless tobacco.
2. The students received HIV/STI information from peers and posters as students who reported not having seen STI/HIV posters were more likely to abuse substances. Majority of the students had insertive vaginal sex but preferred receptive vaginal sex. The condom use was limited due to feeling of unnatural and low availability.
3. The lack of parents involvement increases the risk of substance abuse among the University students. There was a significant association between house occupants and substance abuse  $P < 0.001$ . The abuse of substances was associated with sex among students. Majority of the universities had HIV preventive activities but some never had HIV policy.

## **6.1 RECOMMENDATIONS**

1. The availability of substance abuse and STI/HIV posters and sex education interventions should be enhanced at the universities. The perceived risks need to be enhanced through proper sex education.
2. There is need to enhance appropriate HIV/STI information and condom policies to improve utilization in the campus condom boxes and clinics and be refilled, distributed, accessed and utilized correctly. This will enhance sustainability on condom supply and distribution
3. The parents, guardians and university community need to be involved on substance abuse activities at the Universities. A longitudinal study among students prior to admission in the universities to address risks and factors contributing to substance abuse and STI/HIV.

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## APPENDICES

### APPENDIX 1: SEMI-STRUCTURED QUESTIONNAIRE (SSQ)

#### Questionnaire number

#### Socio demographic data

1. What is your age? 2. Gender 1) Male 2) Female
  
- 3a. What is your residency status while at the University? 1) University hall 2) At home with guardian 3) With a relative in hostel 4) Accredited hostel 5) Rented apartment/room
4. How many occupants reside in the house? -----
  
5. Which of your parents is alive? 1) Mother 2) Father 3) Both 4) None
  
- 6a. Have you ever tried to use any drug for non medical purposes? 1) Yes 2) No **If no skip to Q 16**
  
- 6b. What made you try it? 1) To experiment 2) To ease frustration 3) To gain social acceptance 4) Don't know 5) Peer influence 6) Others

#### Substance abuse

7. Please circle how frequently you **currently abuse** the following substances and whether it has decreased, increased or remained the same while at the University?

#### Frequency

- 1 = never use 5 = once or twice a week  
2 = less than once a month 6 = three or four times a week  
3 = about once a month 7 = nearly every day  
4 = two or three times a month 8 = once a day or more

#### abuse

- 1 = Decreased  
2 = Increased  
3 = Remained the same



Substances	Frequency								abuse		
	1	2	3	4	5	6	7	8	1	2	3
a. Cigarettes, cigars, pipe tobacco											
b. Smokeless tobacco (chew)											
c. Marijuana or hashish											
d. Cocaine (crack)											
e. Stimulants (amphetamines, uppers, speed, methamphetamine)											
f. Sedatives (benzos, barbs)											
g. Hallucinogens (mushrooms, LSD)											
h. Opiates/narcotics (heroin, opium, codeine, morphine, painkillers)											
i. Inhalants (glue, solvents, nitrous oxide, amyl nitrate)											
j. Steroids											
k. Club drugs (ketamine)											
l. Designer drugs (herbal ecstasy, MDMA)											
m. Other substances (please list):											

8. Which of the following best describes the pattern of your substance use since enrolling at the University? 1) Decreased 2) Increased 3) Remained the same

9. During the past 30 days, how many times did you use any substance?

10. Do you often share the substances with other students at the University?

If yes, how often do you share?

11. Which of the following risks have you ever experienced after substance use?

1. Unprotected sex 2. Poor judgment 3. Sexual abuse 4. Physical abuse/fight 5. Others.

### **ALCOHOL USE**

*The following questions refer to your alcohol use habits. For these questions, one drink = a bottle of beer (12 oz.), or a glass of wine (4 oz.), or one mixed drink.*

12. How would you define your current level of drinking?

1. 1-2 drinks 2. 3-4 drinks 3. 5-6 drinks 4. 7-8 drinks 5. More than 8 drinks **If no skip**

**to Q 16**

13. Think of the occasion you drank the **MOST** alcohol this past month. How much did you drink? 1. 1-2 drinks 2. 3-4 drinks 3. 5-6 drinks 4. 7-8 drinks

5. More than 8 drinks

14. Which of the following best describes the pattern of your alcohol use since enrolling at the University? 1. Decreased 2. Increased 3. Remained the same

15. On a given weekend evening, how much alcohol (in drinks) do you typically consume? (Estimate over the past three months.)

1. 1-2 drinks 2. 3-4 drinks 3. 5-6 drinks 4. 7-8 drinks 5. more than 8 drinks

### **Sexual information**

16. Where do you receive sex information/education about STI/HIV? 1) Parents 2) Lecturer 3) Discussion with peers/friends 4) Health care workers 5) Church groups 6) Media 8) Others

17. Does university has STI/HIV/AIDS prevention posters and where are they posted?

18. What are your perceived benefits and barriers to condoms use?

<b>Benefits to condoms use</b>	<b>Barriers to condoms use</b>
1.Safe from disease HIV/ STI	1. Makes me feel unnatural
2. Feel more responsible	2. It is much trouble
3. Be safer from pregnancy	3. My partner would be angry
4. Easily available	4. Lack of trust by him/her
5.Others	5.Rely on my partners cooperation

19. Have you ever had sexual intercourse in the past 12 months? 1) Yes 2) No **If no skip to Q 26** If yes, how many sexual partners did you have sex with? -----

20a). Which type of sex did you practice in the past 12 months? 1) Insertive vaginal intercourse 2) Receptive vaginal intercourse 3) Insertive oral sex 4) Receptive oral sex 5) Non penetrative sex 6) Insertive anal intercourse 7) Receptive anal intercourse 8)Others

20b).

<b>Which risks are you likely to encounter through sex</b>	<b>Which benefits are you likely to encounter through the type of sex</b>
1.Get STI	1. Experience pleasure
2. Get HIV	2. Feel good about self
3.Become pregnant	3. Be more popular
4.Others	4. Relationship gets better

21. During sexual intercourse does your sexual partner use a condom?

a) If yes, how often? 1) Every time 2) Almost every time 3) Never

21). If no, why? 1) Partner dislikes the condom 2) Partner objects 3) lack of availability  
 4) Lack of affordability 5) Enjoy exciting sex 6) Trust 7) Already had unsafe sex with  
 sex partner 8) My regular partner only has unsafe sex 9) Others

22. During sexual intercourse have you ever experienced a slip off, rupture or torn  
 condom? 1) Yes 2) No 3) Not sure

23. Where do you obtain condoms 1) Tuck Shop 2) Chemist 3) University dispensers 4)  
 GOK clinics 5) Nearby shops 6) Night clubs/Hotels 7) Bar/hotel 8) Friends 9) Others

24. What motivated you last time before you had sexual intercourse?

1) Substance abuse 2) Attraction 3) Alcohol 4) drugs 5) Peer influence 6) Others

25. During sexual intercourse, whom did you have sex with 1) Lecturer 2) Fellow student  
 3) University workers 4) Strangers 5) Others

26. What are the reasons for your abstinence from having sex

1. Not ready for sex	6. Do not have a sex partner
2. Worried about pregnancy	7. Waiting for marriage.
3. Acquiring HIV/STI	8. Feel good about self
4. Partner does not want sex	9. Be more popular
5. Religious faith	10. Relationship gets better

27. Which type of sex can facilitate STI transmission? 1) Insertive vaginal intercourse 2)  
 Receptive vaginal intercourse 3) Insertive oral sex 4) Receptive oral sex 5) Non  
 penetrative sex 6) Insertive anal intercourse 7) Receptive anal intercourse 8) Others

28. Which of the following signs and symptoms of STI have you ever experienced?

1) Painful or burning sensation during urination 2) Lower abdominal pain 3)  
 Discharge via vagina or penis 4) Testicular pain in men 5) Frequent urination

6) Pain during sexual intercourse 7) Strong vaginal odor 8) Vaginal itching/irritation

29. Have you ever sought for STI testing? 1) Yes 2) No **If No skip to Q 31**

If yes, from which of the following? 1) GOK 2) Private facility 3) University 4) Others

30. What are the reasons why you sought for STI Test? 1) Voluntary decision 2) Check up suggested by medical staff 3) Requirement for University admission/travel 4) Others

31. Have you ever sought for HIV Testing 1) Yes 2) No **If No skip to Q 33**

If yes from which of the following health facilities? 1) GOK 2) Private facility 3) Others

32. What are the reasons why you sought for HIV Test? 1) Voluntary know the status 2) Check up suggested by medical staff 3) Requirement for University/travel 4) Others

33. What level of HIV/STI risk do you regard yourself to be at? a) High risk b) low risk c) No risk

## APPENDIX 2: FOCUS GROUP DISCUSSION

University name
Date/Start time/End time
Focus group number and number of participants
Name of moderator
Name of rapporteur

1. What reasons make students abuse substances at the university?
2. How are risky sexual behaviors at the university?
3. What make students engage in risky sexual behaviors at the University?
4. What student's networks or associations exist within the University? What role do these networks play in HIV/AIDS activities?
5. What contributes to lack of condom use in the university?
6. What promotes student's sexual risky behaviors patterns?
7. What is the extent of involvement of academic staff, non academic staff and communities at the university in substance abuse and HIV/AIDS activities?

Thank you for cooperation

### APPENDIX 3: KEY INFORMANTS INTERVIEW

University name
Date/Start time/End time
Name of Key informant
Dept/unit
Position held
Name of rapporteur

1. What are the reasons for risky behavior among students in the Universities?
2. Which national HIV/STI policy guidelines are available in the University?
3. What are the characteristics of youth engaging in risky behavior ?
4. How do you regard youths' knowledge about HIV?
5. In your own opinion is there any link between substance abuse and HIV/STIS ?
6. What are factors that contribute to contraceptive use in the University?
7. What is the current substance abuse situation among students in the University?

Thank you for cooperation

#### **APPENDIX 4: CONSENT FORM FOR KEY INFORMANTS INTERVIEW**

You have been contacted in order to carry out an interview for a study that aims to establish the association between substance abuse and HIV/STI risky sexual behaviors among students in Kenyan Universities in order to devise interventions in risk reduction. This study encourages key managers participation and partnership that should lead to an action plan for the development of interventions at the Kenyan Public universities.

Before commencing, we require you to sign, if you agree to participate this consent form. **Therefore please read the following carefully:**

Your participation in the interview is voluntary. We have taken all the necessary measures to maintain confidentiality, so that your name cannot be identified with what you have said. If, after reading this note, you decide that you do not wish to proceed with the interview, you can indicate this to the interviewer. If you do however decide to go ahead, you should be aware that the interview data will be recorded on a computer for subsequent analysis without your name appearing at any moment. If you are in agreement, please sign this consent form with a fictitious name that will be erased and changed into a number after the interview. The team will undertake all measures to prevent breach of confidentiality.

The interview will take about half an hour (30 minutes) of your time. Some participants may feel uncomfortable during the interview, since the topics to be discussed are sensitive. It is important to know that your collaboration can help to reduce substance abuse, risky sexual behaviors that can lead to HIV/STI acquisition.

If something is unclear, or if you have any doubts whatsoever, you may contact any of the following people: The Director, Institute of tropical medicine and infectious diseases (ITROMID),

Jomo Kenyatta University of Agriculture and Technology, Tel. 067 – 52711, *E-mail:* [itromid@nairobi.mimcom.net](mailto:itromid@nairobi.mimcom.net) P. O. Box 62000 00200, Nairobi.

OR The Chairman KEMRI National Ethical Review Committee



P.O. BOX 54840 – 00200 NAIROBI, KENYA. TEL: (254) (020) 2722541, 2713349,  
0722-205901, 0733-400003; E-mail: info@kemri.org

OR

The Secretary/CEO

National Commission for Science Technology and Innovation

P. O. Box 30623-00100, NAIROBI

TEL: 020-310571/2241349/2213471

FAX: 020-2213215

E-MAIL: [stifund@ncst.go.ke](mailto:stifund@ncst.go.ke)

WEBSITE: [www.ncst.go.ke](http://www.ncst.go.ke)

I agree to participate in the study and my fictitious name (pseudonym) is:

\_\_\_\_\_ Date: \_\_\_\_\_

I certify that in my presence the participant has been informed about the possible benefits and risks of participation in the research and has been given the opportunity to ask any questions.

\_\_\_\_\_  
Representative of the research team: Date: \_\_\_\_\_ Place:

\_\_\_\_\_

## **APPENDIX 5: CONSENT FORM FOR FOCUS GROUP DISCUSSION**

You have been contacted in order to carry out a group discussion for a study that aims to assess the association between substance abuse and HIV/STI risky sexual behaviors among Public University students in Kenya in order to devise interventions to reduce the risk. This study encourages youth participation and collaboration that will lead to the development of an action plan for intervention at Kenya's Public Universities. Before commencement you are required to sign this consent form if you agree to participate. Therefore please read the following carefully:

### **Participation**

Your participation in the discussion is totally voluntary. We have taken all the necessary measures to maintain confidentiality, so that your name cannot be identified with what you have said. If, after reading this note, you decide that you do not wish to proceed with the interview, you can indicate this to the interviewer and the procedure will be discontinued. If you decide to go ahead, you should be aware that the interview data will be recorded on a computer for subsequent analysis without your name appearing at any moment. If you are in agreement, please sign this consent form with a fictitious name that will be erased and changed into a number after the interview. The most important objective of the study that we are carrying out is to help us understand how abuse of substances influences sexual behavior. We need to collect data about this subject in order to be able to design prevention programs to reduce substance abuse, risky sexual behaviors that lead to HIV/STI acquisition. The group consists eight students. The group discussion will be co-ordinated by a member of the research team and will take about one and a half hour of your time. Not all members of the group will feel comfortable during the discussion, since the topics to be discussed are sensitive. It is important for you to know that your collaboration can help to reduce substance abuse, risky sexual behaviors that could lead to the acquisition of HIV/STI. For any clarification you may contact any of the following people:

The Director, Institute of tropical medicine and infectious diseases (ITROMID),

Jomo Kenyatta University of Agriculture and Technology, Tel. 067 – 52711, *E-mail:*  
[itromid@nairobi.mimcom.net](mailto:itromid@nairobi.mimcom.net) P. O. Box 62000 00200, Nairobi.

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FAX: 020-2213215

E-MAIL: [stifund@ncst.go.ke](mailto:stifund@ncst.go.ke)

I agree to participate in the study and my fictitious name (pseudonym) is:

\_\_\_\_\_ Date: \_\_\_\_\_

I certify that in my presence the participant has been informed about the possible  
benefits and risks of participation in the research and has been given the opportunity to  
ask any questions. \_\_\_\_\_

Representative of the research team: Date: \_\_\_\_\_ Place:

\_\_\_\_\_

## **APPENDIX 6: CONSENT FORM FOR SSQ**

### **Study title:**

Association between substance abuse and HIV/STI risky sexual behaviors among students in Kenyan Public Universities.

### **PART A**

#### **Introduction**

You are asked to participate in the study because health professionals have noted substance abuse and HIV/STI risky sexual behaviors among students in Kenyan Universities. I want to find substance abuse and HIV/STI information connected with risky sexual behaviors among students in Kenyan Universities.

#### **Being in the study is your choice**

This consent form gives you information about the study, the risks and benefits, and the process that will be explained to you. Once you understand the study and if you agree to take part, you will be asked to sign your name or make your mark on this form and you will be given a copy. Your participation in this study is entirely voluntary.

You may decide to withdraw from the study without facing any consequences.

**Purpose of the study:** The purpose of the study is to establish association between substance abuse and HIV/STI risky sexual behaviors among students in Kenyan public Universities.

**The study will involve:** Structured questionnaires with selected subjects, focussed group discussions and key informants interview.

#### **What to expect during the interview**

I will ask you simple questions on substance abuse, HIV/STI and sexual behaviors.

#### **If you choose not to participate or to leave the study**

You have the choice to or not to participate in this research study. If you choose not to participate in this study or to leave the study during the interview process, you may do so freely without consequences against you.

#### **Risks and/or discomforts**

We do not anticipate any risks or discomforts to you during this study. You will be requested to avail yourself for an interview at a place that you are most comfortable. You may become worried or anxious about discussing matters of substance abuse, HIV/STI and risky sexual behaviors. We will make every effort to protect your privacy and confidentiality while you are participating in the study. The interview will take place in private.

### **Benefits**

Your participation in this study is voluntary and you have the right to refuse to participate or to answer to any question that you feel uncomfortable with. If you change your mind, you have the right to withdraw at any time. If anything is not clear or if you need further information, we shall provide it to you. However the results will be used to assist in formulating policies that may lead to improvement of quality of education among university students as we explore the association between substance abuse and HIV/STI risky sexual behaviors among public university students in Kenya. There is no cost to you for participating in this study.

### **Your records will be private**

Every effort will be made to keep the information you provide confidential. You will be identified only by a code and personal information from the interview will not be released without your written permission. You will not be personally identified in any publication about this study. However absolute confidentiality cannot be guaranteed. Your records may be reviewed by: Study Investigator or Ethics Committee at KEMRI.

### **Harm because of participating in this study**

It is unlikely that any form of harm could happen to you as a result of being in this study. If you ever have questions about this study contact: **Principal Investigator**, Dennis Gichobi Magu. Cell phone no:0722574388Email:gcidennis@yahoo.com

If you have any questions or concerns regarding the study and would like to talk to someone other than the researcher, you are encouraged to contact the following:

The Secretary/Chief Executive Officer, National Commission for Science Technology and Innovation

P. O. Box 30623-00100, NAIROBI TEL: 020-310571/2241349/2213471

E-MAIL: [stifund@ncst.go.ke](mailto:stifund@ncst.go.ke)

OR

The Director, Institute of tropical medicine and infectious diseases (ITROMID),

Jomo Kenyatta University of Agriculture and Technology,

P. O. Box 62000 00200, Nairobi. Tel. 067 – 52711,

*E-mail:* [itromid@nairobi.mimcom.net](mailto:itromid@nairobi.mimcom.net)

OR

The Chairman KEMRI National Ethical Review Committee

P.O. BOX 54840 – 00200 NAIROBI, KENYA.

TEL: (254) (020) 2722541, 2713349, 0722-205901, 0733-400003;

E-mail: [info@kemri.org](mailto:info@kemri.org)

**PART B: CONSENT**

Please read the information sheet (PART A) or have the information read to you carefully before completing and signing this consent form. If you have questions about the study, please ask the investigator prior to signing your consent form.

**Declaration of the volunteer**

I Mr, Miss, Mrs.....hereby give consent to ..... to include me in the proposed study entitled; Association between substance abuse and HIV/STI risky sexual behaviors among students in Kenyan public Universities. I have read the information sheet concerning this study, I understand the aim of the study and what will be required of me if I take part in the study. The risks and benefits if any have been explained to me. Any questions I have concerning the study have been adequately answered. I understand that at any time that I may wish to withdraw from this study I can do so without giving any reason and without affecting my education institution. I consent voluntarily to participate in this study.

Subject's name ..... Signature \_\_\_\_\_  
Date\_\_\_\_\_

Name of person taking consent..... Signature \_\_\_\_\_  
Date\_\_\_\_\_

Name of investigator.....Signature \_\_\_\_\_  
Date \_\_\_\_\_

## **APPENDIX 7: PUBLICATIONS**

### **ADV TROP MED PUB HEALTH INT. 2013; 3(1): 5 - 9.**

Association between risky sexual behaviors and condom use among students in Kenyan universities

Magu D<sup>1\*</sup>, Wanzala P<sup>2</sup>, Mutugi M<sup>3</sup>, Ndahi L<sup>3</sup>, Gathara D<sup>4</sup>

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2. Centre for Public Health Research (CPHR)/KEMRI, Kenya
3. Institute of Tropical Medicine and Infectious Diseases, Jomo Kenyatta University of Agriculture and Technology (JKUAT), Kenya
4. David Gathara Kenya Medical Research Institute-Wellcome Trust, Kenya

Correspondence

Dennis G Magu. Jomo Kenyatta University of Agriculture and Technology (JKUAT), Kenya

Email: magudennis@gmail.com

Magu D, Wanzala P, Mutugi M, Ndahi L, Gathara D. Association between risky sexual behaviors and condom use among students in Kenyan Universities.

### **ABSTRACT**

The youth accounted for approximately 50% of new HIV infections across the globe (UNAIDS, 2008). Lack of condom use is associated with the HIV/STI risks. SSA have majority of the youth with multiple partners during the previous 12 months though in 2000, condom use has increased by 10% (UNICEF, 2010). A cross sectional study was conducted during the month of August 2011 to February 2012. During data analysis, Chi square and multivariate analysis were used. There was no significant association between gender and first sexual intercourse at the Universities  $P= 0.275$ . There was significant relationship between gender and condom use at the Universities  $P < 0.001$  in both male and female. Multivariate analysis showed that gender was a significant control variable when explaining the variability of condom use. To help students make informed sexual decisions various partners must be



involved to broaden their clinical and educational efforts. It is essential that youth receive HIV education on condoms accessibility and have access to health services. University students are the basis of the future and represent the hope for an HIV/AIDS free generation. Condom use barriers and challenges among the youth need to be emphasized in a supportive environment in mobilizing the institution of learning to become a vehicle for a HIV prevention. Mainstreaming HIV/STI prevention and care into other sectors. Youth can be reached through campaigns, clubs, religious groups, sports, workplaces and the media.

**Key words:** risk, sexual, behavior, condom

## **INTRODUCTION**

The expectation to attend higher education is influenced by a complex set of factors, including family, peers and schools. As educational opportunities expand in less-developed countries, the expectations of the youth to attend Universities are important because educational aspirations have been linked to educational attainment. Access to Universities' education is particularly important in less-developed countries where resources are scarce. It is important to understand the forces that influence student's education and to understand how these forces interlink at the Universities. Youth are the foundation of a society, their energy, inventiveness, character and orientation define the pace of development of a nation. socio-political attainments. It is for this reason that this study was conducted among the youth for any meaningful national development. Globally, youth 15-24 years accounted for 45% of new HIV infections (UNAIDS, 2008). Research has documented the fact that substance abuse and not using condoms are the most important indicators associated with the HIV/ STI risks <sup>1</sup>.

Researchers have found both a high prevalence of STI in addition to early onset of sexual activity without protection and youth underestimated HIV risks. Many youth experimented with alcohol and abused other substances compromising their

judgment and increased their chances of engaging in risky sex. There is limited published data on HIV/STI risky behaviors among university students in Africa and indeed in much of Kenya. This has resulted in youth being sidelined by HIV prevention efforts, most of which are directed at high school and out of school youth who are considered to be at high risk of HIV infection. The challenge of growing up in a society where opportunity has been eroded by widespread institutional collapse and Ministry of higher education has limited data on substance abuse, HIV/STI among the youth. The data from the study suggests practical interventions, recommendations and strategies towards reducing HIV/STI and substance abuse among the youth in Kenyan Universities.

## MATERIALS AND METHODS

A cross sectional study was conducted during the month of August 2011 to February 2012. During data analysis, Chi square and multivariate analysis were used.

Multiple logistic regression with adjustment for demographic variables (age and sex) was used to determine the associations between gender and sexual behaviors and condom use behaviors. Independent variable was gender. Dependent variables were sexual behaviors and condom use behaviors.

## RESULTS

Associations between gender, sexual behaviors and condom use are shown in

**Table 1.** Association between gender, sexual behaviors and condom use.

Associations between gender and sexual behaviors and condom use (N=1167)		
Male vs female		
Sexual behaviors	Adjusted OR (95% CI)	p-Value
Sexual orientation		
<22 years	1.00	
>22 years	0.40–1.30(0.72)	0.275
HIV/ STI prevention		
No condom use	1.00	

Condom use	2.14–12.16(5.10)	0.0002**
<b>Number of sexual partners</b>		
One sexual partner	1.00	
2> sexual partners	0.48–1.78 (0.93)	0.820
4> sexual partners	0.77–3.97 (1.75)	0.181
<b>Had sex intercourse past 12 months</b>		
No	1.00	
Yes	0.28–1.13 (0.56)	0.103
<b>Number of sex partners during past 12 months</b>		
One sex partners during past 12 months	1.00	
2> sex partners during past 12 months	0.55–2.45 (1.16)	0.702

## DISCUSSION

Based on data from 2005–2009, 47% of men and 32% of women aged 15–24 years in SSA had sex with multiple partners during the previous 12 months and claimed to have used condoms during their last intercourse. Since 2000, condom use has increased by 10% among young women in 11 of 22 countries based and among young men in 11 of 17 countries based on trend data. The research has revealed that communication about condom use, especially with first sexual partners, was a significant predictor of condom use<sup>4</sup>. The frequency of sexual intercourse has been found to be positively associated with condom use self-efficacy. The association between age and condom use self-efficacy may be moderated by sexual experience which increases with age. The Population Council revealed that where condoms were available, limited distribution systems had made access problematic. The few government outlets available tended to be widely dispersed and private sector sources were frequently limited to urban areas, resulting in uneven availability throughout countries. There has been no donor-government-private sector coordination or streamlining of condom supply and distribution systems,

resulting in a system breakdown. Many youth face difficulties obtaining condoms because of the cost and limited accessibility. Condoms have not been made sufficiently available in places of young people such as Universities. Negative beliefs about condoms are significantly associated with less frequent condom use. The reduction of negative condom beliefs may help towards reducing sexual risks and identifying significant correlates would inform us about what can be done to better promote condom use. The studies on gender differences in condom use have shown that women have greater condom use self-efficacy than men<sup>6</sup>. A few studies have found no gender differences and some have found that men have greater condom use self- efficacy<sup>7</sup> although men have behavioral control over condom use, self-efficacy in women may reflect the ability to communicate about safe sex behaviors and convince their partners to use a condom<sup>8</sup>.

Research has revealed that a female's perception of condom use self-efficacy may rely more on their ability to effectively and convincingly communicate the desire to use condom. Another study has suggested that communication about condom use, especially with first partners, was a significant predictor of condom use<sup>4</sup>.

The association between age and condom use self- efficacy may be moderated by sexual experience, which increases with age. The university students face limited condoms accessibility due to cost considering they have not been made sufficiently available at the institutions. In this study, some of the constructs such as knowledge were drawn from major theories of behavioral change (the information-motivation-behavior skills model).

There was no significant relationship between gender and first sexual intercourse at the Universities  $P= 0.275$ . These results are consistent with most studies on vaginal intercourse<sup>9</sup>. There was significant relationship between gender and condom use at the Universities  $p<0.001$ . A study found that 66% continued to engage in either sex-related or drug-related risky sexual behavior even after they were aware of being HIV status and 42% admitted to having engaged in both types of sex.

## CONCLUSION

The study provided a more comprehensive understanding of youth risky sexual behaviors. The students perceived condom use beneficial and more acceptable for prevention of HIV/STI. Socio-economic factors, inadequate information, condom inaccessibility in health facilities make youth vulnerable. Focusing on recommendation, creating a supportive environment by implementing policies that ensure youth can access HIV and reproductive health education and services i.e VCT. Mobilizing the institution of learning to become a vehicle for a comprehensive prevention and care program for youth in Universities. Mainstreaming HIV/STI prevention and care into other sectors. Youth can be reached through campaigns, clubs, religious groups, sports, workplaces and the media. Their understanding of life is developed both with and among their peers. It is critical that there be monitoring and evaluation of interventions in order to assist key partners, leaders, administrators and policy makers in formulating decisions.

### **Substance abuse among students in Public Universities in Kenya**

Magu D, Mutugi MW, Ndahi LW, Wanzala P

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2. *Institute of Tropical Medicine and Infectious Disease, Jomo Kenyatta University of Agriculture and Technology*
3. *Kenya Medical Research Institute, Centre for Public Health Research, NAIROBI, Kenya*

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**Background:** Tobacco use has become a rapidly growing problem worldwide as well as in many developing countries. It is projected that over the next 50 years close to 450 million deaths would be caused by tobacco use. More than one-quarter of the population

smokes, including 13% of school-age children. Annually, 12,000 Kenyans die from tobacco use related diseases and exposure.

**Objective:** To investigate the association between HIV/STI and substance abuse among students in Public Universities in Kenya.


**Methods:** A cross sectional study was conducted; questionnaires were administered after prior consent of the subjects. Data entry was done in Microsoft Access and analyzed using Statistical Package for Social Sciences (SPSS) version 12.0. Tape recorded qualitative data was coded analyzed thematically and described. Multivariate and univariate analysis for comparisons was done.

**Results:** Males were 69% and females 31%. Only 30.5% had ever used tobacco while 17.1% were current users. Males accounted for 75% of current users compared to 25% amongst females. Of the current users, 84% believed that tobacco was not harmful to health. Two important sources of introduction to tobacco use were friends that accounted for 81% and relatives 18%. Use of tobacco amongst significant others were: friends 24%, fathers 11.0%, relatives 6.2% and mothers 0.2%. The most common sources of supply were nearby shop outlets 51.1% and friends 14.4%. Gender multivariate analysis of associations with daily smoking (adjusted for age, University, leisure activities and gender, respectively), parental monitoring exhibited a consistently protective, dose response effect. Attending a place of worship and going to the movies were protective for females as was watching sports, whereas playing team sport was protective for males and attending a movie was a risk factor for females. Males were more likely to be '*ever smokers*' (Unadjusted OR = 3.51; 95% CI 2.59 – 4.75) as well as '*current smokers*' (Unadjusted OR = 6.89; 95% CI 3.98 – 11.93). The difference in prevalence of smoking between Kenyan Universities was statistically significant for both '*ever smokers*' ( $p < 0.03$ ) and '*current smokers*' ( $p < 0.01$ ). Median age at initiation of smoking was 17 years which did not vary according to Universities.

**Conclusions:**

Prevalence of smoking among males was higher than females in all Universities which was statistically significant. The youth faces a limited perception of their sexual risks of tobacco use. Tobacco use is a concern not only because of the health of the students but also due to the socio-economic consequences and the devastating impact on the society. It is essential to monitor the situation closely by frequent surveys in Kenyan Universities. Sensitization of students against tobacco use practices on entry into Universities will arm them with skills and the knowhow to avoid smoking. The study showed that peer influence was an important source of introduction to tobacco use while selling of tobacco to adolescents in youth aggregation areas was common

## APPENDIX 8: ERC CLEARANCE LETTER

  
**KENYA MEDICAL RESEARCH INSTITUTE**

P.O. Box 54840 - 00200 NAIROBI, Kenya  
Tel: (254) (0)20 2722541, 2713349, 0722-025901, 0735-400003; Fax: (254) (0)20 2720090  
E-mail: director@kemri.org info@kemri.org Website: www.kemri.org

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**KEMRI/RES/7/3/1** September 21, 2010

**TO:** DENNIS G. MAGU,  
PRINCIPAL INVESTIGATOR

**THRO':** DR. YERI KOMBE,  
THE DIRECTOR, CPHR,  
NAIROBI

**RE:** SSC PROTOCOL NO. 1863 (RE-SUBMISSION): ASSOCIATION  
BETWEEN SUBSTANCE USE AND HIV/STI RELATED RISKY SEXUAL  
BEHAVIOURS AMONG STUDENTS IN SELECTED PUBLIC  
UNIVERSITIES IN KENYA

*Forwarded to*  
*[Signature]*  
*22/09/2010*

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Make reference to your letter dated September 10, 2010 received on September 21, 2010. Thank you for your response to the issues raised by the Committee. This is to inform you that the issues raised during the 162<sup>nd</sup> meeting of the KEMRI/ERC meeting held on 6<sup>th</sup> September 2010, have been adequately addressed.


Due consideration has been given to ethical issues and the study is hereby granted approval for implementation effective this **21<sup>st</sup> day of September 2010**, for a period of twelve (12) months.

Please note that authorization to conduct this study will automatically expire on **20<sup>th</sup> September 2011**. If you plan to continue with data collection or analysis beyond this date, please submit an application for continuing approval to the ERC Secretariat by **27<sup>th</sup> July 2011**.

You are required to submit any amendments to this protocol and other information pertinent to human participation in this study to the ERC prior to initiation. You may embark on the study.

Yours sincerely,  
*R. C. Kithinji*  
**R. C. KITHINJI,**  
FOR: SECRETARY,  
**KEMRI/NATIONAL ETHICS REVIEW COMMITTEE**

*[Signature]*  
I HEREBY CERTIFY THIS IS A  
TRUE COPY OF THE ORIGINAL  
A. ONALO OGEKA ADVOCATE  
P. O. Box 21902-00600 NAIROBI



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In Witness Whereof, I have signed this letter at the Kenya Medical Research Institute, Nairobi, Kenya, on the 21<sup>st</sup> day of September 2010.