BARRIERS TO UTILIZATION OF INSTITUTIONAL VOLUNTARY HIV TESTING AND COUNSELING SERVICES AMONG STUDENTS AGED 18-24 IN SELECTED KENYAN PUBLIC UNIVERSITIES

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Barriers to Utilization of Institutional Voluntary HIV Testing and Counseling Services Among Students Aged 18-24 in Selected Kenyan Public Universities

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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

To my loving and tirelessly supportive parents Samuel and Esther, the members of the wide University community who have been directly or indirectly affected by the HIV and AIDS scourge and the tireless and selfless healthcare staff in these institutions that do their best to stand in the gap and put their lives on the line. And to all those involved in research around the epidemic, who go far and wide to increase the current body of knowledge with the intent to ultimately contribute to improving prevention, treatment and care services for people living with HIV and those at risk.

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LIST OF ABBREVIATIONS AND ACRONYMS

AIC	AIDS Information center
AIDS	Acquired immune deficiency syndrome
AOR	Adjusted Odds Ratio
ART	Anti-retroviral therapy
CDC	Centers for disease control
CI	Confidence Interval
CITC	Client initiated testing and counseling
FGD	Focus group discussion
GARPR	Global AIDS Response Progress Reporting
HIV	Human immunodeficiency virus
HTC	HIV testing and counseling
HTS	HIV testing services
JKUAT	Jomo Kenyatta University of Agriculture and Technology
KAIS	Kenya AIDS indicator survey
KASF	Kenya AIDS strategic framework
KHSSP	Kenya Health Sector strategic and investment plan
KNASP	Kenya National HIV/AIDS strategic plan
KU	Kenyatta University
MOH	Ministry of health
NACC	National AIDS control council
NASCOP	National AIDS and STI control program
PEP	Pre-exposure Prophylaxis
PLHIV	People living with HIV
PITC	Provider initiated testing and counseling
PPS	Population proportionate sampling
RH	Reproductive health
SANAC	South Africa National AIDS Consortium
S&D	Stigma and discrimination

SRH	Sexual and reproductive health
STI	Sexually transmitted infection
TB	Tuberculosis
UNAIDS	Joint United Nations Program on HIV/AIDS
UoN	University of Nairobi
VCT	Voluntary counseling and testing
WHO	World health organization

DEFINITION OF KEY WORDS

Barriers obstacles or factors that hinder people from accessing or utilizing VCT services.

Utilization The quantitative measure of use of voluntary HIV testing and counseling services by a target population/consumer base to know their HIV status.

Voluntary counseling and testing (VCT) the process by which an individual undergoes, on his/her own volition, counseling to help him/her make informed choice about being tested for HIV.

ABSTRACT

Kenya is home to an estimated 1.7 million people living with HIV/AIDS. Globally, young people aged 15-24 are a highly vulnerable population with respect to HIV/AIDS infection and transmission. According to the Kenya AIDS Indicator survey (KAIS, 2012), HIV prevalence in the age group 15-24 stood at 2.2%. HIV testing and counseling services play a critical role as an entry point to care and treatment. However, utilization of HIV testing and counseling services among the youth in Kenya has been reportedly low, a trend with negative implications on HIV transmission and treatment outcomes. The main aim of the study was to determine the barriers to utilization of institution-based voluntary counseling and testing (VCT) services among students aged 18-24 in selected public universities in Kenya. The specific objectives were to determine the individual level and facility level factors impeding utilization of institutional voluntary counseling and testing services for HIV among students and assess the associations between various socio-demographic factors and service utilization in institutional VCT facilities. This research adopted a descriptive cross-sectional study design where primarily, data was collected using semi-structured questionnaires and through focus group discussions held with the students in the three public universities; Kenyatta University, University of Nairobi and Jomo Kenyatta University of Agriculture and Technology public Universities. Multi-stage sampling technique was used to reach a student sample size of 305 spread across the three study sites. Results from the study indicated that utilization of institutional VCT services stood at a low of 45% from a population where 84.4% were aware of the presence of these services on their campuses. Accessibility to test site, testing hours, fear to be seen at site and fear of test result were identified as the most commonly reported barriers to service utilization. Additionally, age category ($p=0.02$) and marital status ($p=0.029$) proved to be significantly associated with utilization of VCT services among students. Students from the Health-related departments were more likely to test (OR=1.38) than those from non-health related departments. This study recommends that gender and age-specific specific strategies should be put in place to contribute to improving utilization of services. More so, VCT facilities that reflect the most desired characteristics such as accessibility and flexible testing hours should be used. Further research should also focus on the persisting risky sexual behaviors among university students despite the high knowledge they have on HIV/AIDS.

CHAPTER ONE
INTRODUCTION

1.0 Background information

Since the beginning of the HIV/AIDS epidemic, more than 78 million people worldwide have been infected and approximately 35 million have died from AIDS-related illnesses. In 2013, 35.3 million people worldwide were living with HIV including 3.3 million children and there were approximately 2.3 million new HIV infections. Approximately 95% are in low- and middle-income countries. There are now about 36.7 million people living with HIV globally. In the year 2015, approximately 2.1 million people became newly infected with HIV and 1.1 million people died from AIDS related deaths (UNAIDS, 2016). Sub-Sahara Africa is the most seriously affected region where an estimated 45% of all new HIV infections occur in the age group 15-24 years, and AIDS being the leading cause of death (Ramjee & Daniels, 2013). The region accounted for 68% of HIV infections worldwide (UNAIDS, 2011) and has 75 % of all youth living with HIV though it is home to only approximately 10% of the world's youth.

With an estimated 1.6 million people living with HIV and AIDS, Kenya is one of the countries in the Sub-Sahara region that has been hardly hit by the epidemic. Despite reductions in new infections, prevalence rates and an increased coverage of those who need ARV drugs in sub-Saharan Africa, the numbers of those infected are still quite high in Kenya and recent studies show a need to put effort towards reducing the prevalence rate further, particularly among the youth (Kimanga, 2014). In Kenya as in any other country, HIV testing and counseling services serve as a very important entry point to HIV&AIDS care and treatment (NASCOP, 2015). The number of service delivery points has been increasing in the country from only three sites in 1999 to close to the current 5,000. This has seen a larger portion of the population gain access and knowledge of their HIV status and hence access and/or enrolment to care for those who test positive and thus enabling them access the highest standards of health too just like other citizens, this being a constitutional right.

The HIV/AIDS pandemic is posing big challenges for the academic institutions too since the infection is currently killing young economically productive people thus depriving the country of a qualified and productive labor force. The higher institutions also play a great role in research and education around issues of HIV and AIDS in many countries. However, they can also serve as a hotbed of HIV transmission since it constitutes largely a potentially fertile breeding ground for the infection because they bring together in close physical proximity, devoid of systematic supervision, a large number of young adults at their peak years of sexual activity and experimentation. A recent research done in Kenya indicated the rise of transactional and inter-generational sex, predation and multiple sexual partners as a big challenge among university students (Mwangi, Ngure, Thiga, & Ngure, 2014). This has fueled the further spread of the infection in this highly productive population.

Since HIV/AIDS programs have always focused on key and priority populations, efforts have been put to ensure that institutions of higher learning can also have facilities where people can seek or receive HIV testing and counseling services. These service delivery points are often integrated into the existing health service units or operate as stand-alone voluntary counseling and testing sites. Institutions of higher learning therefore have two major responsibilities in relation to HIV/AIDS. On the one hand, they must protect themselves so that they can operate efficiently and effectively in an environment where unchecked HIV/AIDS threatens to disrupt the human capital formation process, and on the other hand they must gear themselves to respond more dynamically to the needs of an HIV/AIDS infected society.

1.1 Statement of the problem

University education in Kenya has become increasingly and widely accessible to many, with the government gradually adjusting the entry grades for government-sponsored students as well as several new campuses being set up across the country. This has seen many young people securing a place in the highly competitive institutions of higher learning. These institutions of higher learning in Kenya largely comprise of young

people at the peak of sexual activity and experimentation. As a result, many young people who are highly sexually active and at the peak of sexual experimentation are congregated together.

Integration of HIV testing and counseling services into the university health services has therefore become an important priority. University health services play a great role in ensuring and improving the health of the university community. In a study conducted among 923 students at the University of Nairobi, nearly 30% reported having had multiple partners in the previous 12 months, 27.4% of the students did not use condoms with sexual partners and 21% had engaged in sex after drinking within the previous 3 months (Othieno *et al.*., 2015). In another HIV/AIDS assessment from a representative sample of 1,917 university students at Moi University in Eldoret, 89% of students reported thinking they were at risk for HIV infection, but only 28% of them had been tested for HIV. Just like as it was described in the previous section, sexual activity on campus was reportedly high and many students considered themselves at risk. Conversely, consistent use of condoms and rates of voluntary counseling and testing were also low. Despite increased knowledge on HIV/AIDS among the young people, utilization of HIV testing and counseling services among them has been reportedly low. Research evidence shows a low prevalence of HIV counseling and testing among young people in Sub-Saharan Africa (Mbabazi, 2018).

University students are quite knowledgeable in issues of HIV/AIDS, but studies have shown that utilization of HIV testing and counseling services among them is quite low. Despite the availability of free voluntary HIV testing and counseling services in most institutions of higher learning in Kenya, as a targeted intervention, utilization of the services is still low (Nganga & Waruiru, 2014).

University going students are a high-risk population with respect to HIV/AIDS infection (Magu *et al.*., 2015). This is majorly attributed to early sexual debut, inconsistent use of condoms, high number of sexual and concurrent partners, intergenerational sex and the abuse of drugs and alcohol. But milestones have been made in Kenya in terms of

training of VCT counselors based on national guidelines, stigma has been reported to have decreased and service centers have been made more widely accessible.

A review of data from JKUAT hospital's VCT shows that utilization of the services is low compared to the figures for the general population. The facility at the institution served only 171 clients in the age group 15-24 while an outside facility (Wakibe health center VCT) that is comparable with the latter had 324 clients falling in the same age group in the month of February 2016, an indicator of poor uptake of VCT services offered at institutions of learning, whose increased uptake and utilization would go a long way in keeping the epidemic at check within this highly sexually active portion of the population.

1.2 Justification of the study

Study findings from UNAIDS show that about 50% of all new HIV infections are in young people aged 15-24 (UNAIDS, 2014). This study focused on one group of young people at high risk of HIV infections, the university students. It is often argued that although the majority of university students are part of the 15–24 age group, due to their life circumstances their vulnerability to HIV while at university is uniquely high (Nkomazana & Maharaj, 2014). Young people in the Universities are highly productive members of the population and form a large reservoir for a nation's labor force. These young men and women hold the dreams and aspirations of their families and communities who have greatly invested in them. A huge blow from the HIV/AIDS epidemic to this lot will definitely impact greatly on the socio-economic progress of families, communities, institutions and the nation.

HIV testing and counseling still remains the most important gateway to prevention and care services. Knowledge of one's HIV status is an important step in the management of HIV. When individuals know their HIV status, they are more likely to take measures to protect themselves and their partners, but lack of knowledge of HIV status can fuel the transmission of the virus. There is dire need to establish the factors influencing utilization of these services especially among key populations and in interventions

targeting them. This study aimed to explore those factors barring utilization of services at institution-based facilities. With the current recommendation by NASCOP to enroll all people who test positive to HIV into care and treatment irrespective of their CD4 counts, more effective and successful strategies are needed in HIV testing sites to ensure increased utilization of institution-based facilities and hence a high turnover from testing to care and treatment services.

The prevalence of HIV in the age group 15-49 in Kenya is 5.9% (NACC, 2013). Taking into account the fact that the University community is largely composed of a sexually active portion of the population and based on the knowledge that utilization of HIV counseling and testing services by the young people is low (Mbengo, 2013), it is necessary to explore the factors that deter undergraduate students from utilizing these services available in facilities within the institutions. Many countries, Kenya included, have taken steps to increase the utilization of HIV testing and counseling services and especially among key and vulnerable populations. Despite an increase in utilization of testing services, a wide and considerable gap still persists. Between 2003 and 2007, it was estimated that approximately 83% of people living with HIV/AIDS remained undiagnosed (Kimanga, Ogola & Umuro, 2014).

The Kenya AIDS Indicator Survey of 2012 reported an average uptake of 71.3% in adults and adolescents aged 15-64 years. This showed an increased overall uptake of HIV testing and counseling services. A study in Kenya showed that approximately 29% of all new HIV infections are among the adolescents and the youth (15-24), a group that makes up about 19% of the Kenyan population. More so, AIDS is the leading cause of death and morbidity among adolescents and young people in Kenya, a group reported to have poor adherence to treatment and also poor treatment outcomes (Kabogo J., *et al.*, 2018).

HIV/AIDS has now become an important part of the curriculum in tertiary institutions for almost all first-year students (Kitila, 2013). University students are therefore expected to be more knowledgeable in HIV/AIDS issues compared to the general population (Meda, 2013). The government also targeted to ensure that all tertiary

institutions have functional AIDS control units that attain Maisha 2 certification. Despite all these efforts, data from JKUAT hospital VCT shows that the rate of utilization of these services is lower compared to the patterns observed in the general population.

Most studies have focused on unraveling the factors that influence utilization of VCT services among the youth; however, no study has really sought to establish the core factors that hinder them to utilize services specifically designed for them, within their institutions. Previous research has demonstrated that when individuals know their HIV status, they are more likely to take up steps to protect themselves and others, and are able to take up treatment services for those who are positive. This then translates into lowering the rates of transmission and improves the quality of life for those living with HIV. Findings from the study will inform the actors involved in health service delivery in institutions and therefore can be used in developing more effective strategies that overcome these barriers and hence enabling optimum utilization to be a reality.

1.4 Research Objectives

1.4.1 Broad objective

To determine barriers to utilization of institutional voluntary HIV testing and counseling services among students aged 18-24 in selected Kenyan public universities.

1.4.2 Specific objectives

i. To determine individual level factors impeding utilization of institutional voluntary counseling and testing for HIV among students aged 18-24 in selected Kenyan public universities.
ii. To determine facility level factors impeding utilization of institutional VCT services for HIV among students aged 18-24 from selected Kenyan public universities.
iii. To establish the associations between socio-demographic factors and utilization of voluntary HIV testing and counseling among students aged 18-24 in institutional VCT facilities.

1.5 Research questions

i. What individual level factors impede utilization of institutional VCT services for HIV among students aged 18-24 from selected Kenyan public universities?

ii. Which facility level factors impede utilization of institutional VCT services for HIV among students aged 18-24 from selected Kenyan public universities?

iii. What are the associations between socio-demographic factors and utilization of HIV testing and counseling in institutional VCT facilities by undergraduate students aged 18-24 from selected Kenyan public?

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This chapter discusses the review of available literature on HIV/AIDS and utilization of voluntary counseling and testing services. It also highlights research findings on barriers to utilization of VCT services in recent studies among the youth and discusses the existing gaps in knowledge on barriers to utilization of the services.

2.2 Conceptual framework

This research was based on the Andersen and Newman's framework of healthcare services utilization, which aids in unmasking the conditions and factors that either facilitate or impede utilization. It is based on a basic theory that an individual's access to and use of health services is considered to be a function of three key components (Gezahegn, 2018):

i. Predisposing factors
ii. Enabling factors
iii. Need factors

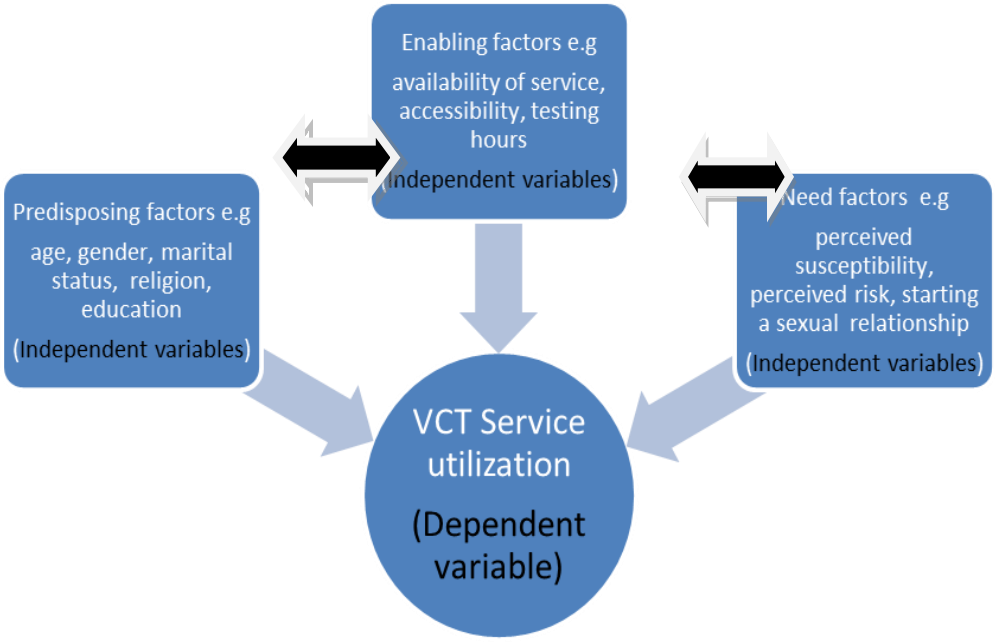

Figure 2. 1: Conceptual framework of utilization of VCT services (Adopted and modified from Seidu, 2020)

In this study, the health service was Voluntary counseling and testing for HIV at a facility in an institution of higher learning. Given that the actual utilization of the service is lower compared to similar facilities outside the institution, then it points out that there could be some factors that either facilitate or impede the utilization of these services. Firstly, it can be argued that for one to seek a health service, it may be because he or she needs the benefit of using that service. That need could be either evaluated or perceived. Some people may seek VCT services because a health professional has evaluated their health status and recommended uptake of the service. Also, due to an illness, an individual can opt to utilize the service because he or she needs it. Secondly, people may want to access and utilize a service because of a variety of predisposing factors. For example, age, gender, sexual orientation, sexual behaviors, among others. Lastly, there are some enabling factors that aid access and utilization of a health service. E.g., cost, accessibility, knowledge. Some people may have better knowledge on the importance of testing for HIV. If one is charged a fee to receive the service, the cost will enable as well

as hinder others. If a facility is within reach or distanced, then it can affect one's access and utilization.

This framework therefore enabled the study of the barriers to utilization of VCT services among students in public Universities in Kenya.

2.3 Introduction

HIV has become a global public health concern since its discovery in early 1980s. Globally the number of people living with HIV has risen from 8 million in 1990 to over 34 million in 2011. It is a worse situation for Africa as over 65 % of those infected are in Sub-Saharan Africa (UNAIDS, 2015). At the end of 2002, UNAIDS had described a world in which HIV/AIDS continued to spread vastly and faster in all countries. The number of people living with HIV had increased from 31.7 million in 2003 to 35.3 million in 2013 as a result of continuing new infections, people living longer with HIV and general population growth (UNAIDS, 2014). However, the global prevalence rate has leveled since 2001 and the number of people newly infected with HIV in the last decade has also declined, hence contributing to stabilization of the epidemic.

WHO's global fact sheet on HIV/AIDS describes the disease as one of the most destructive diseases humans have ever faced. It is described as bringing with it socioeconomic and public health consequences. Currently HIV/AIDS is the leading cause of death worldwide (WHO, 2013). In 2013, 35.3 million people were living with HIV worldwide including 3.3 million children. The global prevalence rate among 15–49-year-olds was 0.8% and there were approximately 2.3 million new infections that year including 260,000 children. Approximately 95% of these new infections were in low- and middle-income countries. It is also evident that a high number of young people have been affected. An estimated 5,500 new HIV infections daily are in adults aged 15 years and older, of whom 47% are among women and about 39% are among young people aged 15-24. A total of 1.6 million people died from AIDS related illnesses during the same year.

Although the testing capacity has increased overtime, the majority of people with HIV are still unaware that they are infected and hence this greatly undermines control efforts.

Since the beginning of the epidemic, more than 75 million people have been infected with HIV, approximately 36 million have died from AIDS related illnesses (UNAIDS, 2016). It is estimated that each day 6,300 individuals worldwide are infected with HIV. The global HIV estimates as of 2015 are shown in the table below:

Table 2. 1 Global estimates of PLHIV 2015 (All ages)

Region	**PLHIV (Millions)**		**New HIV infections**		**PLHIV on ART**		**AIDS related deaths**	
	2010	2015	2010	2015	2010	2015	2010	2015
Global	33.3	36.7	2.2	2.1	7.5	17.03	1.5	1.1
Asia and Pacific	4.7	5.1	0.31	0.3	0.91	2.1	0.24	0.18
Eastern and Southern Africa	17.2	19.0	1.1	0.96	4.1	10.3	0.76	0.47
Eastern Europe and Central Asia	1.0	1.5	0.12	0.19	0.11	0.32	0.04	0.047
Latin America and the Carribean	1.8	2.0	0.1	0.1	0.57	0.32	0.06	0.05
Middle East and North Africa	0.19	0.23	0.02	0.021	0.14	0.04	0.001	0.012
Western and Central Africa	6.3	6.5	0.45	0.41	0.014	1.83	0.37	0.33
Western and Central Europe and North America	2.1	2.4	0.092	0.091	0.91	1.42	0.029	0.022

Source: Global AIDS Response Progress Reporting (GARP) 2016: UNAIDS 2016 estimates

2.4 An overview of HIV status in Kenya

According to the National Aids Control Council, (2012), Kenya is ranked fourth in the world amongst countries with the highest HIV prevalence rate at 6.3 %. South Africa

tops the list with Nigeria and India coming in second and third. South Africa has a population of 5.6 million PLHIV, 3.3 million PLHIV in Nigeria while India has 2.6 million PLHIV. The impact of the HIV prevalence in Kenya is profound and an impediment toward the achievement of the country's blue print guiding the development process i.e., the Vision 2030. For instance, AIDS related infections contribute to 29% of all deaths in Kenya – higher than cancer and malaria." This presents a public health and social economic challenge.

According to KAIS 2012, the national prevalence in the general population among 15–49-year-olds was 5.6%, a decline from 2007's 7.1%. The incidence was 0.5% and there were approximately 106,000 new infections that year. The prevalence among women was at 6.9% while that of the men was 4.4% (NASCOP, 2014).

The Kenya 2014 HIV estimates report shows a national prevalence of 6%; 5.6% and 7.6% among adult males and females respectively during the year 2013. The report further indicates that there were approximately 1.6 million people living with HIV in the country, with 50,000 AIDS related deaths and about 100,000 new HIV infections that year (NACC, 2014). HIV prevalence among young females aged 15-24 was higher than that of males in the same age group at 2.7% and 1.7% respectively. Overall HIV prevalence was 2.2% for the same age group. Notably young women in this age group account for 21% of all new HIV infections in Kenya, a clear incidence marker. These statistics show how developing countries have been vastly affected by the epidemic. The main mode of infection in the region is largely through heterosexual intercourse (Fettig, J. 2014). HIV/AIDS is described as the leading cause of deaths and disability adjusted life years in Kenya (MOH, 2013).

2.5 HIV/AIDS and Tertiary institutions

Tertiary institutions have not been spared by the scourge. Research evidence indicate that Universities in the sub-Saharan Africa see their main pre-occupation as conducting research on HIV/AIDS rather than possible victims of the same disease, yet the disease is increasingly taking a heavy toll of most of these universities' most learned and

experienced scholars (Oppong, & Oti-Boadi, 2013). These are difficult persons to replace because they take lots of time and resources to train. HIV/AIDS is also causing deaths of very young men and women in these Universities thus depriving the country of future talents and skills. This implies there is an urgent need for universities in the sub-Saharan Africa to seriously view themselves as vulnerable and to put in place serious and practical efforts to combat HIV/AIDS within the institutions' community. Activities such as HIV/AIDS awareness campaigns and more informed public HIV/AIDS health education should be intensified in these Universities and similar efforts replicated in other educational institutions such as schools and colleges which is where a great majority of the youth are found. With reference to tertiary institutions, the universities of South Africa identified five important reasons why tertiary institutions should explicitly engage the challenge of HIV/AIDS (Mavhandu-Mudzusi, Netshandama, & Risenga 2014). These reasons are pertinent for other African tertiary institutions as well. That:

i. HIV/AIDS is a development issue, not just a health issue. It affects the social, economic, and psychological well-being of individuals and communities. It conditions national capacities for economic and political development. It is therefore a legitimate topic for university inquiry.
ii. HIV/AIDS affects not just individuals, but institutions. Tertiary education institutions are vulnerable to the negative impact of HIV/AIDS on their core operations of management, teaching, research, and community outreach.
iii. HIV/AIDS directly conditions the possibilities for human resource development. Tertiary level educators are among the most skilled individuals in most economies, and tertiary students are particularly vulnerable to infection. At risk is the loss of the most valuable and productive citizens in the economy.
iv. The struggle against HIV/AIDS requires new knowledge. Universities are charged with the mission of generating new technologies, practices, and understanding through research. These contributions are needed to help African countries prevent and cope with HIV/AIDS.

v. The fight against HIV/AIDS requires leadership. Tertiary level staff and students are traditionally among the leaders of their societies, and their active commitment is essential to the development of open national debate and action responses related to the HIV/AIDS epidemic.

The above reasons show why tertiary institutions must mount an effective response strategy against the epidemic. In addition, practical financial reasons should motivate institutional managers to recognize and tackle the threat of HIV/AIDS. One university from Southern Africa reports spending 10% of its recurrent budget on AIDS-related expenses such as funerals, death benefits, and health care (Ardington, Barnighausen, Case, & Menendez, 2014). In addition, the indirect costs of the disease to an institution can be substantial. They include lost productivity due to staff illness, loss of staffing resources through death, loss of institutional expertise, the cost of recruiting replacement staff, the cost of re-training staff to take on additional responsibilities when AIDS-induced absenteeism occurs, the financial losses when student loans are not repaid due to illness or death and the loss of public and family investment.

Developing an institutional policy on HIV/AIDS is the first action that tertiary institutions should take. A written institutional policy provides explanation for internal decisions and legitimacy for actions taken in the process of AIDS control and prevention. Surprisingly, not all tertiary institutions have such policies in place. The presence of such policies could aid in defining the rights and responsibilities of staff and students, integration of HIV/AIDS into teaching, research and community service, preventive services and supportive care on-campus and structures for policy implementation, monitoring and review. This would go a long way in boosting the fight against the epidemic in tertiary institutions which have actually, evidently been affected.

2.6 HIV testing and counseling services (HTS)

HIV testing is an integral component of HIV prevention strategies and provides a gateway to treatment and care. Knowledge of one's HIV status is a prerequisite for seeking and obtaining medical care, including antiretroviral therapy (ART), and may act

to mobilize support networks and discourage risky sexual behavior. Knowledge of one's HIV status may act to mobilize support networks, increase sensitivity and decrease stigma, open dialogue regarding future plans and status disclosure, and discourage risky sexual behaviors (Camlin, Charlebois & Getahun, 2020). Over the past decade, as the expansion of ARTs in the developing world has made medications and treatment more widely available, HIV testing and efforts to link HIV-positive individuals to available treatment and care have become important policy priorities. Even so, lack of knowledge of HIV status remains an important programmatic barrier to initiating ART support.

Universal access to treatment implies achieving universal knowledge of HIV status. If people living with HIV/AIDS have to access care and management for the infection, then they have to know their HIV status, and this can only be through taking up HIV testing and counseling services. Additional strategies therefore have to be developed to reach diverse populations (NASCOP, 2015). Creation of demand for HTC services through social mobilization strategies is key. Until recently, stand-alone VCT clinics have been the principal testing modality in many countries. In 2004, the UNAIDS amplified its testing guidance to support provider initiated offers of HIV testing and detailed WHO/UNAIDS guidance on PITC were issued in 2007 (UNAIDS, 2013).

2.7 HIV Testing and Counseling in Kenya

In Kenya as in other countries, HIV testing and counseling is the gateway to HIV prevention, care and treatment (Nganga, *et, al*., 2014). Through HTC, individuals who are HIV positive can be linked with treatment, care and support programs/services. Those who are negative are linked to prevention services. HIV testing centers then popularly known as VCT sites have increased from only 3 in 1998 to a nationwide coverage of about 3000 in 2013. Currently there are about 5,980 testing sites in the country (NASCOP, 2015), manned by trained and certified counselors. Depending on the context, HIV testing is broadly marketed to or directed at specific high-risk populations.

One of the objectives of the Kenya HTS guidelines is to provide comprehensive guidance for the delivery of high-quality HIV testing services in all approaches and settings in Kenya and to provide guidance for strengthening linkage to care and treatment and other post-test services. In the recent years, HIV/AIDS testing and counseling has been scaled up in Kenya as a quick response to the epidemic. This has led to an increase in the number of people gaining knowledge of their HIV status. The country has adopted many strategies. There are two main broad approaches to HTS services. These are client-initiated testing and counseling and provider-initiated testing and counseling. CITC entails the client seeking and initiating the HTC services in either the community /facility settings based on own volition. PITC entails a service provider offering HIV testing to clients within a facility regardless of the reason for their visit (NASCOP, 2015). The service is offered with the 'opt out' option based on informed choice. HTC services in Kenya are offered on two broad settings; facility based and community based. Limitations of these approaches have been noted including the under-use of stand-alone and facility based VCT and low rates of client-initiated testing among key populations (UNAIDS, 2013).

However, despite increased coverage, it still appears that there are several barriers to HIV testing and counseling especially among the young people, who most of them are in tertiary institutions.

The uptake is however still low as only about 49% of Kenyan adults have ever been tested (NASCOP, 2014). In 2014, 53% of women had tested for HIV in the past twelve months and received their results, alongside 45% of men.

The following chart illustrates the approaches and settings through which HTC services are offered in Kenya.

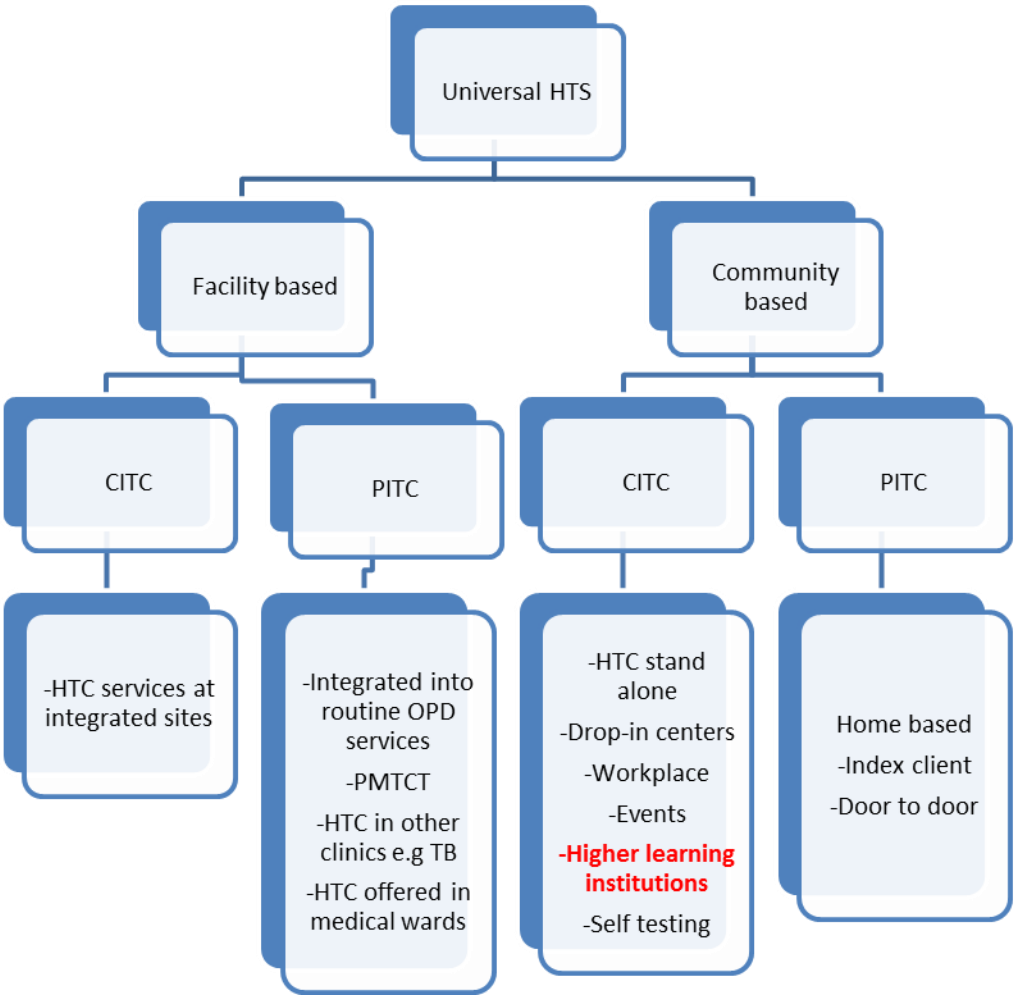

Figure 2. 2: Approaches and settings of HTS in Kenya (Adopted from the Kenya HTS Guidelines 2015, NACC)

Source: National AIDS Control Council: Kenya HTS Guidelines 2015.

Among the main objectives set out by the Kenya AIDS Strategic Framework 2014/2015-2018/2019, reducing new infections by 75% and mortality by 25% were among key priorities. Achieving such optimistic goals requires an increased uptake and utilization of HTC services, since then can individuals who test positive be enrolled to care and treatment while those who test negative are linked to other preventive measures. This therefore emphasizes the role that uptake and utilization of services play in the achievement of the set objectives.

2.7.1 The Kenya HTS package

In consistence with international policies and technical standards, the Ministry of Health emphasizes the need to conduct all HIV testing services in Kenya in accordance with the best interests of the client. HTC services are guided by five core principles; consent, confidentiality, counseling, correct results and connection/linkage to appropriate post-test services.

According to the 2015 Kenya National HTS guidelines, consent should be verbal or written and should be voluntary as informed in the HIV and AIDS prevention and control Act of 2006. The interaction between the client and the service provider should be confidential including all records and information shared. Counseling, a confidential interaction between the client and the service provider, should be aimed at allowing for informed decisions and benefits from the HTS package. Adequate information about and around the service should be given. Correct test results are a crucial part of the process. Quality assurance and control measures to ensure quality testing and issuance of correct results should be put in place (NASCOP, 2015). Providers should therefore stick to the national HIV testing algorithm.

The primary components of the HTS package include

- Pre-test session
- HIV test
- Post-test session
- Referral and linkage to appropriate health services
- Assessment of other related conditions such as TB

The four elements make up the minimum service package of HTC aimed at enabling clients to understand their HIV risk, take the HIV test, come up with a risk reduction plan and take up appropriate referrals. HTS services should be accompanied by appropriate comprehensive and effective referral and linkage to post-test services (NASCOP, 2015). Clients who test HIV positive should be linked to care, treatment and support services. Clients who test HIV negative and are at risk of HIV should be linked

to effective prevention interventions. Clients in need of other post-test services such as SRH, or TB services should also be linked appropriately. Clients who need post-test services including HIV care and treatment should be issued with a standard referral form filled in triplicate.

Table 2. 2 Summary of the HTS package

Pre-test counseling/pre-test information
CITC -Introduction and orientation to session -Risk assessment -Consent for test
PITC -Introduction and information on importance of testing for HIV -Consent for test -Test preparation
Perform test
Post-test counseling for negative results -Risk reduction plan -Linkage to other HIV prevention interventions -Re-testing where applicable
Post-test counseling for positive results -Enrolment to care and treatment -Risk reduction and positive living counseling -Partner/family testing
Referral and linkage -Document the referrals; HIV positive and HIV negative in need of further health services issued with a copy of the referral form. -Where possible, escort the HIV positive client to care and treatment center.

Source: National AIDS Control Council: Kenya HTS Guidelines 2015

2.7.2 HIV testing and counseling (HTC) for young people

It's thought that only 10% of young men and 15% of young women living in sub-Saharan Africa know their HIV status. Increasing access to and utilization of HIV testing is vital to prevent further transmission of HIV among these young people who are highly vulnerable. A study in South Africa found that HIV testing and counseling (HTC) among 4,000 young people caused 41% fewer cases of HIV transmission in a

four-year period. It is therefore clear that efforts to reduce the barriers that exist between the youth in the Universities and testing uptake would go a long way in achieving good control of the infection in these institutions.

2.8 Young people as a priority group in HIV/AIDS programs

Among the vulnerable groups are the youth and females for obvious reasons ranging from biological, social-economic and drugs abuse. The impact of the pandemic has caused major concerns at the family and community levels and has affected government's spending and the development process at all levels. The most vulnerable groups including youth need special targeting in HIV and AIDS programming. In this endeavor, particular emphasis needs to be provision of appropriate information and change of sexual behavior.

Young people are at the center of the global HIV/AIDS epidemic/pandemic. This is true both in countries with a generalized epidemic and in those with a concentrated pandemic. An estimated 45% of all new HIV infections occur in the age group 15-24 years (Risher, Cori, Reniers & Marston, 2021), and in this group the prevalence is higher in females than males. Young people are at an increased risk of contracting HIV because once they become sexually active, they often have several usually consecutive short term sexual relationships and do not consistently use condoms. HIV/AIDS is the leading cause of death among young people in the East African region (Govender & Masebo, 2018). However, young people can make responsible decisions about their health if they are given the information, services and support necessary for adopting safe behaviors.

Programmatic indicators can be used to assess the essential components of HIV prevention interventions for young people at the national and the local levels and can thus be used to track changes overtime. Programmatic indicators measure impact at the population level. Data can be obtained from record books. Minimal data for facility-based indicators can be obtained by disaggregation of all clients by age and sex.

Young people aged 15-24 account for more than 50% of all HIV infections worldwide excluding peri-natal cases. More than 7000 young people are newly infected with HIV

each day throughout the world. In Africa alone, an estimated 1.7 million young people are infected annually. Schools, colleges and Universities are a special setting where young people make up a majority of the population. KHSSP 2013-2017 describes such institutions as congregate settings and given the fact that it is largely composed of the youth who are among the at-risk populations, efforts that would improve the uptake and outcomes of services in these institutions are worth investing in.

VCT is part of a wider package in HIV prevention and management interventions. The general needs of young people, children, families and couples must also be addressed as part of providing comprehensive services. Young people actively seek and receive VCT services where VCT have not been specifically designed for them. Patterns of health services use differ for young people by setting and among different groups. Young people in industrialized nations also have different patterns of health services use particularly for reproductive health and STI/HIV health services. There is no ideal model of VCT services for young people. With regard to an integrated VCT into the school/college's health services, studies from the United States proposed that school-based clinics provide easier and more acceptable access to VCT services than other formal health settings.

2.9 Voluntary counseling and testing

VCT is an HIV intervention that involves both voluntary pre- and post-test counseling and voluntary HIV testing (NASCOP, 2015). People out of their own free will opt for VCT and it provides them with an opportunity to confidentially explore and understand their HIV risks and to learn their HIV test results. VCT stands for

- Voluntary- without coercion, a person decides to take a HIV test.
- Counseling- about risk assessment, risk reduction, emotional support and referral.
- Testing- done using an approved HIV testing protocol.

The major components of HIV testing and counseling are:

- Counseling
- Laboratory tests
- Data/ management information systems
- Links to care and support services
- IEC to address benefits, availability, access to and how to deal with stigma.

VCT began being used in Kenya in 1995. In 1997, Session paper no.4 on HIV/AIDS was tabled in parliament. In it, VCT was identified as a major tool for HIV/AIDS control and a viable means of preventing mother to child transmission of HIV. It was not until 2000 however that the government initiated and actively supported the development of comprehensive guidelines for counseling and testing in the context of VCT, which now serves as the policy on VCT (Fettig & Swaminathan, 2014). These guidelines were developed by a team of technical experts drawn from relevant fields of expertise led by the CDC office in Kenya. PLHIV were also represented. The process was relatively fast with the guidelines completed and published within a period of months.

Voluntary counseling and testing is performed with the aim of informing people of their HIV status (NASCOP, 2015). The goal of VCT is to lower HIV transmission through reduction in high-risk sexual behavior, improved medical care and support services for both HIV positive and negative persons and therefore testing is a critical first step for people to know what actions they should take to avoid getting infected or to avoid transmitting the infection and to gain access to proper medical treatment. VCT is actually a major means of HIV/AIDS control. Persons with a history of high-risk behavior, couples planning to get married and pregnant women are the main groups of people who should receive voluntary counseling and testing services. The next most important group is the youth (Fettig & Swaminathan, 2014). Kenya is one of the countries in East, Central and Southern Africa with comprehensive national guidelines covering all aspects of VCT with regard to HIV/AIDS. VCT should therefore be regarded as a public health and a developmental initiative, a human rights imperative and a way to provide individuals with an opportunity to plan for the future and gain

access to appropriate health and support services ((Fettig & Swaminathan, 2014). This is so for institutions of higher learning too.

2.9.1 VCT as an entry point to prevention and care services

Universal access to HIV testing in a country is a key policy goal, but as countries scale up treatment programs, it is vital for testing to reach persons most at risk of HIV so that they may access care and support.

Voluntary counseling and testing services is a process whereby an individual or couple undergo counseling to enable his/her/them make an informed choice about being tested for HIV, a decision that must be entirely the choice of the individual and he/she must be assured that the process will be confidential (Mwale, M. 2014). VCT is much more than just drawing blood and offering a few counseling services. It's a vital point of entry to other HIV/AIDS services including prevention and clinical management of HIV related illnesses, TB, control, psycho social and legal support and PMTCT of HIV. High quality VCT enables and encourages people with HIV to access appropriate care and is an effective HIV prevention strategy (Alemie & Balcha, 2012). VCT offers benefits to those who test negative and positive. It alleviates anxiety, increases client's perception of their vulnerability to HIV, promotes behavior change, facilitates early referral for care and support including access to care including ART and also assists in reducing stigma in the community.

VCT has been shown to have several advantages as it leads to informed decisions, provides an entry point into prevention and treatment and can lead to reduction in risky sexual behaviors (Mbengo, 2013). However, VCT's can also lead to HIV/AIDS related stigma and discrimination, negative emotional outcomes, large economic costs, lack of privacy and confidentiality and shortage of resources. Institutional VCT's should have strong referral services. Most strategies used to promote VCT services have long focused on increasing access, availability, quality and uptake (WHO, UNAIDS, 2012). Some of the ways that can be used to promote VCT uptake include:

- Community mobilization programs

- Outreach and mobile services
- Promotions
- Mass media campaigns
- Special promotion
- Standardized data collection systems.

In response to the low uptake of VCT services by tertiary students, many South African higher education institutions implemented the First things First Campaign in 2012 in order to boost the uptake of VCT services. This was an innovative voluntary HIV testing, counseling and education campaign at public higher education institutions aimed at helping the South African tertiary students to fulfill their destinies by encouraging them to be responsible, get tested for HIV and empower themselves by knowing their status and committing to behaviors that will protect them and their peers (Fettig, 2014). Scaling up access and outreach to testing among underserved populations in particular, including men in rural areas, remains an important frontier on the road to achieving universal access to treatment and support in most countries.

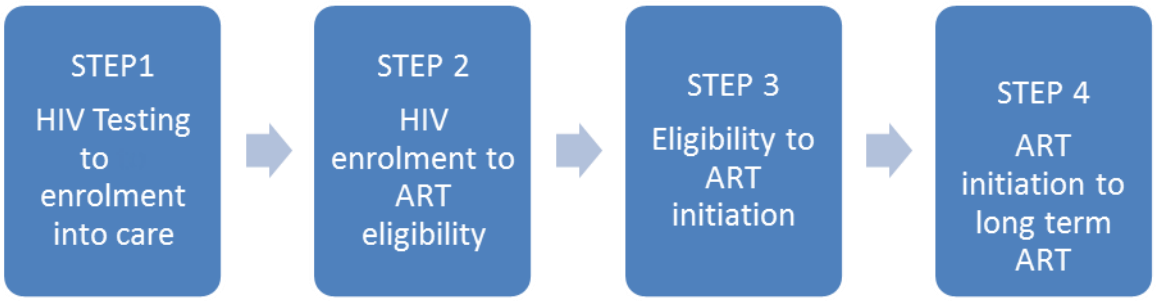

Figure 2. 3: Steps of engagement in care continuum

2.10 Barriers to HIV testing and counseling

According to Mbengo (2013), several factors are at play in determining and influencing the use of VCT. These can be identified as:

a) **Personal-oriented factors**- knowledge about VCT and HIV/AIDS, levels of education, attitudes towards VCT services, perceptions towards

HIV/AIDS and VCT, age, gender and HIV/AIDS related stigma and discrimination.

b) **Service-oriented factors**- these include accessibility to VCT, confidentiality and attitude of healthcare workers, affordability of VCT services, availability and quality of services offered.

Personal-oriented factors

Age

Age is a factor influencing the use of VCT services. As seen in a study in Ethiopia, the respondents of age group 20–29 utilized VCT services 3 times better than 40 years and above (AOR: 3.03; 95% CI: 1.4, 6.13) (Desta *et al*., 2017).

In contrast, another study showed that the age of adolescents were significantly associated with VCT service utilization. The finding of this study revealed that the age of adolescents above 18 years were 0.64 time more likely to utilize VCT services than those whose the age was below 18 years old (AOR = 0.642; 95%CI = 0.453– 0.909) (Nega, *et al,* 2019).

Gender

Gender is also an important factor influencing the use of VCT services. Gender powerfully shapes attitudes towards testing. Overall, men (28 %) were relatively more likely to get tested for HIV than women (23.7 %) through VCT (Teklehaimanot, *et, al,* 2016). Men tend to underestimate their risk to HIV infection than do women, despite reporting more high-risky behaviors and women have more fears about testing than do men. The limited uptake of VCT by men is mainly due to the male ideology of invulnerability and emotional control. For example, in a study among university students in Ethiopia, **r**evealed that there was a statistically significant association with the voluntary counseling test (VCT) experience, The logistic regression results revealed that male participants less likely experienced VCT (AOR = 0.549; 95%CI: 0.330, 0.910;) compared to female students (Lema, Sali & Admasu, 2022). Another similar study revealed that in terms of gender, more females (86.8%) mentioned that they went for the services in order to know their status compared to the males (54.8%) (Epule, *et,*

al., 2013).

Level of Education

The level of education is related to the use of VCT services. A study by Sambah in Ghana revealed that the women who reported having at least some secondary education were nearly 3.6 times more likely to accept VCT than women who had received either no formal education or a primary school education, and women who had a post-secondary education were 5.6 times more likely to agree to VCT. At the bivariate level, women who had secondary or higher educational attainment were almost three times likely to receive HTC results compared with women who have no formal education [COR = 2.660; CI = 1.984, 3.568] (Sambah, Baatiema, Appiah, Ameyaw & Budu, 2020).

Similar findings were reported in Kenya in which the sample distribution by highest level of education showed that a significantly greater proportion of males who had ever been tested had secondary or higher education than their never tested counterparts (Kabiru *et al.* 2011). The study also revealed that 66 percent of the males who were in school at the time of the survey had been tested compared to 50 percent of those not in school. Another similar study revealed educational attainment to be a strong predictor of HIV testing among women of child bearing age in this population. High HIV testing uptake among educated pregnant women indicated that low-educated women may not fully realize the benefits of testing for HIV. Educational attainment was strongly associated with HIV testing among 15,388 women of child bearing age [AOR 3.8, 95% CI 1.7–8.2; p = 0.001]. (Muyunda, Musonda, Mee, Todd & Michelo, 2014).

Attitude towards VCT

The negative attitudes towards VCT can discourage people towards seeking VCT services, whilst positive attitudes towards VCT can motivate people towards seeking VCT service the belief that HIV testing is only for the ill may discourage some healthy people who want an HIV test from seeking it (Janet, Jeffrey & Cheryl, 2016). Moreover, the fear of receiving a positive HIV diagnosis can discourage people towards seeking VCT services. A recurrent finding is that the main reason people do not take HIV tests

or return for a result is fear (Defo, Emmanuel, & Jobert, (2017).

In a study among Ghanain male youth, the respondents‟ negative attitudes that associated VCT utilization with an abstinence career, noting that they would not go for VCT because they may be told to stop sexual activity constrained their utilization of VCT services (Gadegbeku, 2013). In contrast, people can be motivated towards seeking VCT services due to the positive attitudes they have towards VCT. A study on HIV VCT in Nakuru, Kenya revealed that participants had positive attitudes towards VCT and were more willing to seek HIV testing (Ndwiga & Omwono, 2014). The study revealed that the positive attitudes towards VCT held by participants include; VCT was necessary to know one's HIV status, protect themselves and their partner(s) from infection, make plans for their future, get treatment and to prepare for death.

Level of perceived HIV risk

A recent study identified the two main reasons mentioned by study participant for not using VCT service were not feeling at risk and trusting one-self and their sexual partner (Tsegay, Edris & Meseret, 2013). The respondents felt at risk of HIV infection either because of their own or their partner's sexual behavior. In contrast, the low perception of risk may discourage some healthy people who want an HIV test from seeking it. Younger married persons utilized the services more than older married persons, resulting from their perceived higher risk of infection while the older married person believed the issue of HIV and screening is a new era that does not concern them. From the 176 respondents who had not gone for VCT, 48.3% felt that they trusted their spouses and had never been unfaithful to each other, so it was not seen as necessary going for VCT (Epule & Ndiva, 2013). A major barrier to HIV testing is the individuals' reluctance to acknowledge that they are at risk even when in fact they are. For instance, a study in rural Ethiopia revealed that those who tested more were those who perceived themselves as having a small risk of HIV infection (Teklehaimanot & Yohannes, 2016).

Stigma and discrimination

Fear of stigmatization and discrimination is a major factor influencing acceptability of VCT services. Majority of respondents believe stigmatization and discrimination

following HIV tests positive status, attitude of health workers to clients, location of VCT centre and level of education were the major barriers affecting utilization of VCT. (Bibiana, *et al*., 2018). The effects of HIV/ADS-related stigma and discrimination can be felt on many levels: individual, family, community, programmatic, and societal. They represent obstacles such as preventing individuals from being tested; preventing persons from recognizing that they or family members are HIV positive; inhibiting people from seeking care, support, and treatment.

A study in Nigeria among university students revealed that, the risk of stigma and rejection and a lack of understanding about positive living contribute to university students being unaware of their HIV status (Odimwengu, *et al*.., 2013). Indeed stigma and discrimination have been reported as factors constituting a serious impediment for VCT uptake and HIV prevention in Nigeria and elsewhere (Odimwengu, *et al*.., 2013). Stigmatization can go a long way in discouraging people from utilization of VCT.

Service-oriented factors

Low coverage of VCT sites- The low coverage of VCT services is a reported barrier of VCT uptake. For example, a study in sub-Saharan Africa reported that given the low HTC rates, it appears that adolescents' willingness to be tested is not matched by their HTC uptake, and factors reducing access to testing need to be elicited and addressed (Sam-Agudu, Folayan & Ezeanolue, 2016). There is therefore need to increase the coverage of VCT services in order to make them more accessible and to boost their uptake.

Confidentiality and attitude of service providers- Confidentiality and the attitude of health care workers have an effect on the utilization of VCT services. A study in among the youth North West Ethiopia showed that there was a significant association between the use of VCT and the presence of confidential testing. The possible reason for this could be because HIV remains a stigmatizing condition, that people feel more comfortable taking the VCT service when they are confident that the issue is kept secret (Alem, Sisay & Alemayehu, 2020).

Knowledge of the importance of testing for HIV- The knowledge of someone with

HIV/AIDS increases the likelihood of being tested for HIV. A study in Nigeria among the seventy (46.7%) respondents have good knowledge of VCT; and 58 (82.9%) of the 70 respondents that have the knowledge of VCT said to know at least one center where the service is offered. This is contrary to a study in Kisii Central District, Kenya where there is a high level of awareness of VCT services (99.6%), however, very few respondents had actually made active use of the services. In a similar study in Zambia, the participant's attitude towards VCT was very high and appreciable which is very important and needed in the prevention and control of HIV. Majority believed that VCT is necessary for different reasons including knowing self-status and caring for the future, to prevent partners and others from HIV and to choose partners for the future (Addis, Yalew & Shiferaw, 2013).

Availability and Quality of services

The availability and quality of service offered have an effect on the utilization of VCT services (Epule, T. *et, al*., 2012). Studies have shown that VCT uptake is high in urban areas than rural areas and utilization was dependent on knowledge of VCT availability. This finding is in line with the study in Ethiopia and Uganda. This is attributed to the fact that more knowledgeable VCT centers will accept offerings and HIV testing and counseling services, which will lead to increased use (Alem, *et, al*., 2020).

Accessibility of testing facility

Accessibility to a VCT site would have an effect on whether that service would be utilized or not. Structural barriers to VCT have been well-documented and suggest that distance is a prohibitive factor for accessing testing services, particularly in rural areas. The chances of VCT utilization among students who knew the test sites were 2.01 times higher than those who did not know it (AOR=2.01, 95% CI: 1.29–3.13) (Alem, *et, al*., 2020).

Refusal to be tested or to obtain test results has been attributed in part to obstacles of cost and transportation and to the burden of having to return to health facilities. Door-to-door testing removed the obstacle of travel, which is time-consuming and costly. Travelling to reach a health facility imposes both a direct cost (for a mini-bus or bicycle

rental), but also the opportunity of costs of hours travelling and waiting to be seen by a health care provider (Angotti *et al.* 2009).

2.11 HIV/AIDS stigma and discrimination in Kenya

Stigma refers to the devaluation of people living or associated with HIV/AIDS. A person who is stigmatized is seen as having less value or worth than other people. This usually happens when someone's condition is attributed to behaviors that society considers improper. Discrimination on the other hand refers to what happens when someone is treated in an unjust, unfair or a prejudicial way, often on the basis of belonging to a particular group. Discrimination is how stigma is manifested or enacted. Although awareness of HIV/AIDS is comparatively high in Kenya, many people living with HIV/AIDS in Kenya still faces high levels of stigma and discrimination. This deters many people and especially vulnerable populations, from seeking vital HIV services. However, accepting attitudes among the general population towards PLHIV increased in Kenya between 2003-2007 rising from 27% to 33% among men and from 39.4 to 47% among women. However, levels of stigma and discrimination remain too high to foster an environment for a more effective national HIV response.

As the country grapples with how to reduce the number of new infections, stigma and discrimination continue to disrupt and discourage access to HIV education and support services. A study among the youths in Kapsabet, Kenya, identified several factors that deter the youth from seeking HIV tests such as stigma, lack of youth friendly services, fear of being found out, fear of positive results, beliefs, peer influence, provider attitudes and a feeling that they are not at risk of HIV infection (Ndwiga & Omwono, 2014). Further findings indicated that VCT sites are not well equipped to respond to youth issues. There is demand for VCT (people want to know their HIV status), and more demand can also be created when comprehensive services are made available and stigma is reduced. Care related activities including increased access to ART, must be made more widely available given the dynamic context of HIV and that access to care (including ART) requires people to know their status.

2.12 What is the future of HIV/AIDS in Kenya?

Kenya has made huge strides in tackling the HIV/AIDS epidemic. However, current efforts seem not to be reaching those who need these services the most. As a result, concentrated epidemics are slowly emerging among vulnerable populations (Kimanga, *et al..*, 2014). Moreover, there are still unacceptable numbers of people who do not know their HIV status. The further scale up of HIV testing and counseling is therefore vital. However, in order to get more people in Kenya to test for HIV, as well as an increase in the provision of HIV services, a number of social, cultural and legal barriers need to be overcome which prevent many people, particularly those belonging to key affected populations from accessing them. Continued expansion of VCT services and integrated opportunities to be tested during regular medical care and, more broadly, an increase in access to healthcare overall remain policy priorities in sub-Saharan Africa. Treatment as well as prevention is contingent on the identification of seropositive individuals. Scaling up testing, particularly among men, rural residents, and other hard-to-reach populations, remains a critical part of HIV prevention and treatment efforts.

The third Kenya National AIDS Strategic Plan (KNASP III) prioritizes prevention of new infections through various prevention strategies to be implemented; increasing availability and access to counseling and testing, condom promotion, strengthening STI and HIV program linkages and ensuring prevention and treatment options are mutually supportive (Musyoki, *et al.,* 2021). It also targeted improving the quality of life of people living with HIV through improving availability and access to treatment and care.

The KASF 2019's vision of a Kenya free of HIV infections, stigma and AIDS related deaths may help contribute to achievement of Vision 2030 if it ensures universal access to comprehensive HIV prevention, care and treatment through its objectives of reducing new HIV infections by 75% and reducing AIDS related mortality by 25% (NACC, 2013). This can be boosted by reducing the current barriers to utilization of VCT services among the youth.

CHAPTER THREE

METHODOLOGY

3.1 Study design

A descriptive cross-sectional study was employed to study the barriers to utilization of voluntary HIV testing and counseling services offered in institutions of higher learning among students aged 18-24 in Kenya. This design was aimed at generating quantitative and qualitative information on the possible barriers to utilization of testing services. This design was most appropriate as it would provide the data to best describe the barriers to utilization of VCT services among undergraduate students at a time when utilization rates among the young people are low. Two approaches were applied to collect data during the study. The first one is where self-administered questionnaires were given to students and the second is where focus group discussions were held with students. Field notes were used to collect data on feelings and thoughts about VCT services in institutions during FGDs. Where secondary data was available at the VCT facilities, data was reviewed from the existing file records and were analyzed to give an insight into the utilization rates for the services for the past few years. The research was the primary reason for data collection and analysis.

3.2 Study site

This study was conducted at main campuses of three selected public mother Universities in Kenya: JKUAT, Kenyatta University and the University of Nairobi. These Universities were randomly selected from a list of the six mother public Universities in Kenya. Public Universities have the largest population of young people in college level. More so, they have high resident student populations in cosmopolitan areas and therefore a good target for such a study. Past research on utilization of VCT services had

been conducted mostly in private Universities in Kenya, but public Universities had not received adequate attention despite having established VCT facilities for quite a while.
The University of Nairobi lies at latitude -1.28 and longitude 36.81 and was established in 1956. It currently has a student population of more than 70,000 students distributed across various campuses. The main campus is situated at the heart of Nairobi and is therefore surrounded by typical urban lifestyles. Kenyatta University, established in 1985, also has a large student population of more than 71,000 in the several campuses across the country. The main campus is located at Kahawa, in Kiambu County and lies at latitude -1.98 and longitude 36.92. JKUAT was established in 1994 and currently has a student population of more than 30,000. The main campus is located at Juja town in Kiambu and lies at latitude -1.09 and longitude 37.01.

3.2 Study variables

This study based its statistical analyses around the following variables:

a. **Dependent/outcome variable- Utilization of HIV testing and counseling services** in an institution's facility, as assessed by the question 'Have you ever sought testing at the facility?
b. **Independent variables (Individual and facility level factors)**

   -**Socio-demographic factors**- age, gender, marital status, department, religion and year of study.

   -**Individual related factors**- Awareness of presence of VCT, knowledge of VCT, stigma and discrimination, fear to be seen at VCT, fear of test result.

   -**Facility-related factors**- presence/availability of VCT, accessibility, testing hours, model of testing.

3.3 Target population

The study involved undergraduate students aged 18-24 registered in a Public University in Kenya.

3.3.1 Inclusion criteria

Any undergraduate student aged 18-24 in a public university sampled and who gave informed consent to participate in the study.

3.3.2 Exclusion criteria

Any undergraduate student not within the age category 18-24 in a public university sampled and all those who did not consent to participate in the study.

3.4 Sampling

3.4.1 Sample size determination

The sample size was determined using the Fisher *et al.* (1998) formula, based on the prevalence of VCT service utilization of 17.7% during the past year among university students (JKUAT Hospital Data 2016). Using 5% margin of error at 95% confidence level, the minimum sample size required was 246 after considering a 10% non-response rate.

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

Where

n=sample size

z= statistic for a level of confidence at 95% which gives a value of 1.96

p=expected proportion of utilization of VCT estimated at 17.7 %

d= precision with 95% confidence interval which gives a margin of error of ±0.05

Therefore, the minimum sample size needed for the qualitative part of the study on uptake is

$$n = \frac{1.96^2 \, 0.177\,(1-0.177)}{0.05^2} = 223 + 23 = 246$$

The sample size for each University was then determined using population proportionate sampling technique depending on their estimated population retrieved from the Commission for University Education admission **(CUE)** statistics of 2016, as shown in Table 3.1 below. This was the minimum calculated sample size needed for the study. Each institution would have to be stratified into two categories and further into the various years of study (Table 3.1), however, the sample sizes at JKUAT and UoN were increased to 100 each to ensure good representativeness of the study. The final sample size was therefore 305.

Table 3. 1Sample size for each institution (undergraduates aged 18-24)

	KU (N=60,000)		UoN (N=50,000)		JKUAT(N=30,000)	
Department	Health	Non-Health	Health	Non-Health	Health	Non-Health
Year 1	9	9	10	9	11	12
Year 2	17	12	14	12	16	13
Year 3	14	11	10	9	10	12
Year 4	10	10	11	10	14	12
Year 5		13		15		
Total	50	55	45	55	41	49

3.4.2 Sampling and study procedure

A sample is a part of the population which is studied in order to make inference about the whole population. The main reason for sampling in research is that in many cases the population is so large and scattered that complete coverage may not be possible. It also offers a high degree of accuracy because it deals with a small number of persons.

In this study, multi-stage sampling technique was used to select study subjects. First, with a list of the mother public Universities in Kenya, three public Universities were randomly selected. Due to variations in the student population in the selected institutions, the sample size for each University was determined using PPS. Each University was then stratified further into health and non-health related categories based on the assumption that being from either could have an effect in utilization of services. Departments in each stratum were then randomly selected and the chosen department (1

in each) stratified further into the various years of study to ensure that each group was represented. Data collection was done with pre-tested, pre-coded, and self-administered questionnaires with open and closed ended questions. As data collection commenced, the principal investigator approached the department chosen and requested for a private and convenient room, easily accessible to students and where they would comfortably fill in the questionnaires.

To randomly identify the respondents for the study, the researcher used class lists from the selected departments to randomly select potential participants. The selected students were given adequate introduction on the study matter and information on how to fill the questionnaires and the PI/RA was also present to elaborate any unclear questions. The procedure was repeated until the desired sample size for each site and stratum was reached.

This structured questionnaire was adapted from similar previous studies and sample of questions were modified to the study setting. The questionnaires were self-administered to collect socio-demographic information and other important variables that included: VCT utilization, individual's knowledge, sources of information and other variables. Pretesting of the questionnaire was performed on a few students of JKUAT to verify clarity of the instrument used and capacity to capture the subjects in the study.

The questionnaires were administered in English language since the target population was a highly literate one and did not require any translation. Each questionnaire filled was checked for completeness of the information jointly by the principal investigator and a trained research assistant in the institution. To reduce the errors arising from respondents, 5% of randomly selected questionnaires were rechecked for consistencies by the principal investigator.

3.4.3 Sampling frame

Sampling included students aged between 18 and 24 from three of the six public mother Universities in Kenya and were fully registered for studies in these Universities.

3.5 Data management

Data collected from this study were used to determine the barriers that impede utilization of VCT services in institution-based facilities among university students aged 18-24.

3.5.1 Data collection

Primary data was collected using questionnaires and focus group discussion. The researcher used self-administered questionnaires to collect both quantitative and qualitative data from the respondents who can read and write. Both open ended and closed ended questions were designed so as to give freedom to the respondents to write what they feel about the various components in the study. This tool was advantageous as it enabled respondents to give information freely without fear. The questionnaires were administered by the researcher/research assistant at private rooms within the chosen departments and students were approached and requested to participate in the study. Those who consented went ahead to fill in the questionnaires.

Focus Group Discussions

A focus group discussion (FGDs) is another data collection technique adopted in the field. Mishra (2016) *et al.*. defines a focus group as a type of in-depth interview accomplished in a group, whose meetings present characteristics defined with respect to the proposal, size, composition, and interview procedures. The focus or object of analysis is the interaction inside the group. It involves engaging a number of people at the same time, the emphasis being on probes and responses between the researcher and participants. A focus group discussion in this study was geared towards obtaining in-depth information on perceptions, views and feelings of the students on utilization of VCT services on campus.

Three Focus group discussions each involving eight students from each University were conducted and data obtained were captured as short notes during the discussions. Three focus group discussions each involving eight students from each University were conducted separately and data obtained were captured as short notes during the discussions. The participants were randomly selected during the interviews and

requested to participate at own will in the discussion which was organized to the convenience and flexibility of the participants. The researcher used lottery to pick 12 maximum number of members for a FGD random numbers from the particular sample size for each institution. The researcher would then request respondents whose interviewing order corresponded to the random numbers picked to participate in a Focus group discussion. Those who consented were given further directions while for those who did not the researcher would request the next respondent. This was repeated until the desired number of members was achieved. The FGDs were held at convenient places and time for all members involved, within the premises of the institution.

3.5.2 Data entry

Data were cleaned and stored on a daily basis by the principal investigator. Accuracy of the data was done by cross-checking the print of a data source with a random number of questionnaires picked from the lot. Data entry was done by two people. For qualitative data, raw data was read through repeatedly to see whether the content was okay; responses complete quality of transcripts and pattern of responses. The data were summarized according to themes related to the objectives of the study and thematically analyzed manually. This involved a detailed review of the notes captured during FGD's, listing the themes engraved therein and organizing the emerging points and their frequency of mentions in line with variables measured by the objectives.

3.5.3 Data analysis

Data was cleaned, coded and entered in SPSS software version 22 for analysis. Summary statistics of independent variables were then presented using frequency tables and graphs. Pearson’s Chi square test was performed and odds ratios were computed to assess the strength and directions of associations between socio-demographic factors and uptake of VCT services. Qualitative data emerging from the FGDs were first summarized after reading through the notes taken carefully and repeatedly. The researcher then identified the emerging themes and categorized them according to the

variables measured in the study. The researcher then interpreted the results of the FGD in the context of the study to answer the objectives accordingly. Results were presented in form of text, tables and graphs.

3.5.4 Dissemination of findings

The study findings will be shared with the AIDS control units in the universities. Copies will also be submitted to the Colleges of health sciences and other stakeholders in charge of health services in universities. The study findings have also been published and can be accessed in the Africa Health Sciences Journal.

3.5.5 Ethical Considerations

All research related ethical standards were observed throughout the course of the study. Permission to conduct the study was sought from the JKUAT department of public and community health and further approval from the Kenyatta National Hospital-University of Nairobi ethics and research committee. The researcher further sought formal permission and authority from the relevant authorities in the three Universities where data was to be collected. Informed consent was obtained and signed by those involved in the study. All data obtained was treated with high confidentiality with no identifying details being collected and all documents containing the data collected kept under lock and key.

To deal with emotional stress that could arise in the process of collecting data from the students, the researcher ensured that each questionnaire had his contacts and further establish close contact and communication with the institution's student counselor who could be called in if need arose. Also, contact was made with peer counselors in the University to stand-in in case of any arising case. The peer counselors also formed an important link between the students counseling office at the University and the students themselves. However, the questionnaire was highly simplified to reduce the chances of evoking stress among the study subjects by avoiding questions that demand strictly personal and sensitive information.

CHAPTER FOUR

RESULTS

4.1 Introduction

The study targeted 305 students aged 18-24 from selected public Universities in Kenya. However, 276 responded to the questionnaires leading to a response rate of 90.5%. This chapter presents the results of the study based on the procedure described in the research methodology. The data provides socio-demographic characteristics of the respondents, highlights the individual and facility level factors affecting utilization of VCT services among students and also reports on the associations between the socio-demographics of the respondents and utilization of the VCT services. Summary tables are used to report the data.

4.2 Socio-demographics

A total of 276 respondents adequately completed the questionnaires. Of these, 48.9% were females while 51.1% males. The mean age of the respondents was 21 years. On marital status a great majority (97.1%) was single and only a few were married (2.1%). The distribution across year of study were, 17.8% first years, 30.4% second, 22.1% third, 19.6% fourth and 10.1% fifth years. 49.3% came from a health related department while 50.7% were from a non-health related department. The frequencies are as depicted in Table 4.1 below:

Table 4. 1 Socio-demographic characteristics of respondents

Factor		Frequency (N=276)	Percentage (%)
Age	18-20	102	37.0
	21-24	174	63.0
Gender	Female	135	48.9
	Male	141	51.1
Year of study	Junior (1^{st} & 2^{nd})	133	17.8
	Senior (3^{rd}, 4^{th} & 5^{th})	143	30.4
Department	Health related departments	136	49.3
	Non-health related	140	50.7
Marital status	Single	268	97.1
	Married	8	2.9
Religion	Christian	217	78.6
	Muslim	48	17.4
	Hindu	7	2.5
	Other	4	1.4

4.3 Individual level factors and utilization of HIV testing and counseling services

Of the 276 respondents, a majority (82.6%) have ever been tested for HIV while only a few (17.4%) have never been tested. Of those who have ever taken the test, 60.5 percent have only been tested once while the rest (39.5%) have tested more than once. 50.6% of those who have ever tested cited testing on their own volition, 24.6% tested after being persuaded by friend/relative/partner, 11.4% tested after a healthcare provider initiated the process and 11.4% tested to fulfill a requirement.

The results also showed that many students (66.2%) tested more than three months ago while only a few (33.8%) were tested in the last three months.

It was evident that a majority of the respondents were aware of presence of VCT services within the institutions. Of the 276 respondents in the study, 97.1% of them are aware of VCT services while only 2.9% have never heard of VCT services. Of those

who are aware of VCT services, 79.1% have ever tested in a VCT and the rest (20.1%) have never used a VCT.

When asked whether they were aware of the presence of a VCT on campus, 84.4% said they were aware while 15.6% have never heard of a VCT on campus indicating a relatively high level of awareness.

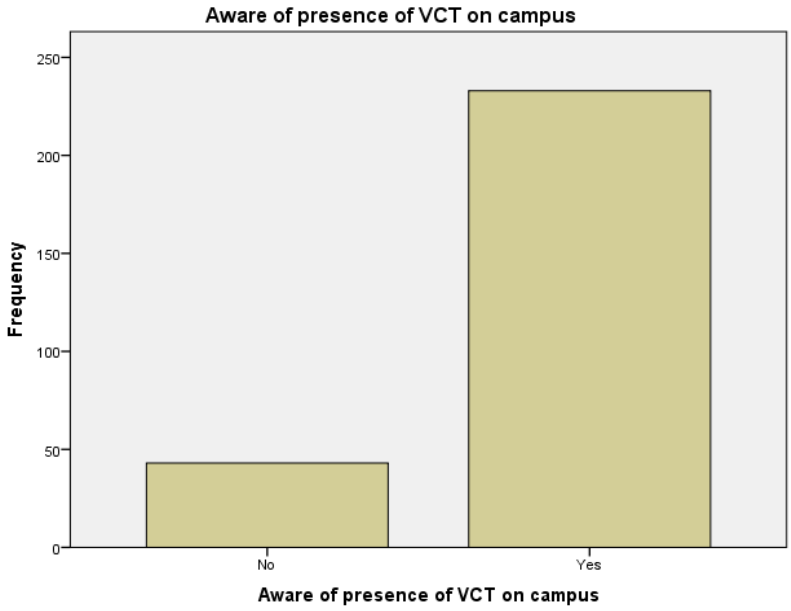

Figure 4. 1: Awareness on presence of VCT on campus

However, of those who were aware of the VCT being available on campus, only 45.1% have ever utilized it, while 54.9% have never utilized the facilities for testing and counseling as depicted in the graph below.

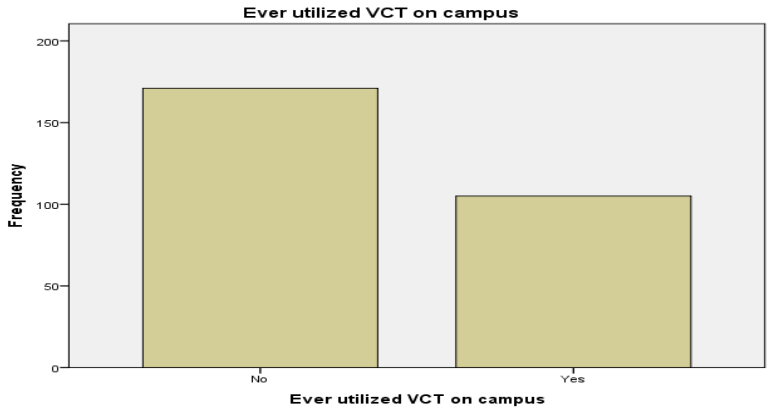

Figure 4. 2: Utilization of VCT on campus

The researcher also inquired on use of any other model of HIV testing and counseling by the students. It emerged that mobile testing and counseling seems to be the most popular (50.4%), followed by Provider initiated testing, counseling (25.7%), self-testing (12.7%) while Moonlight testing and counseling (11.2%) ranked last. These findings are summarized in Table 4.2 below.

Table 4. 2Utilization of HTS

Characteristic		Frequency (n)	Percentage (%)
Ever tested	Yes	228	82.6
	No	48	17.4
Frequency of test	Once	138	60.5
	More than once	90	39.5
Why tested	Own volition	120	50.6
	Persuaded by friends/relative/partner	56	24.6
	Initiated by provider	26	11.4
	Fulfilling a requirement	26	11.4
When last tested	0-3 Months	77	33.8
	More than 3 months	151	66.2
Awareness of VCT services	Yes	268	97.1
	No	8	2.9
Ever used VCT	Yes	212	79.1
	No	56	20.9
Awareness of VCT on campus	Yes	233	84.4
	No	43	15.6
Ever used VCT on campus	Yes	105	45.1
	No	128	54.9
Other model utilized	Provider initiated testing and counseling	71	25.7
	Mobile testing and counseling	139	50.4
	Self-testing	35	12.7
	Moonlight testing and counseling	31	11.2

4.4 Facility level factors associated with VCT utilization

Several facility level factors were also assessed on the effect they could have on utilization of services. When asked on the effect of the model of testing on utilization, a majority (79.3%) agreed that the model does affect utilization of the services while 20.7% were convinced it does not.

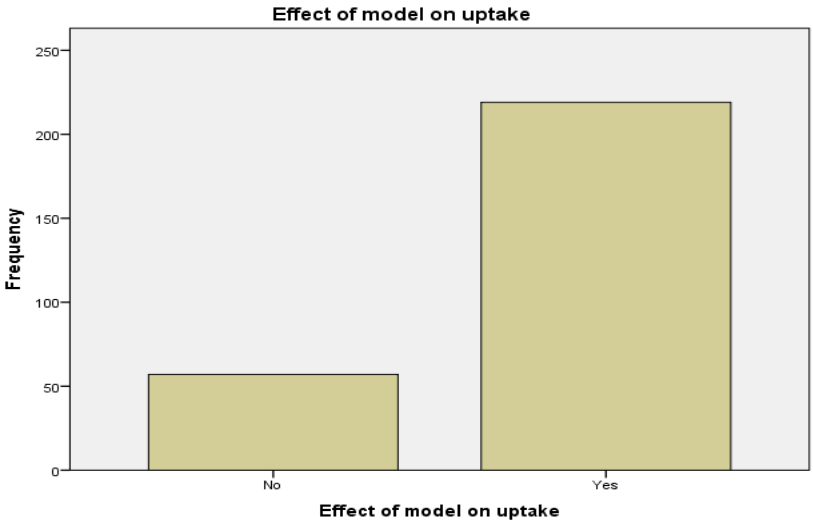

Figure 4. 3: Effect of model on utilization of services

The influence of stigma and discrimination on use of services was also investigated. As seen in the table below, 29% of the respondents strongly agreed while a majority (38.8%) agreed that S&D does affect utilization of services. This is illustrated in the chart below.

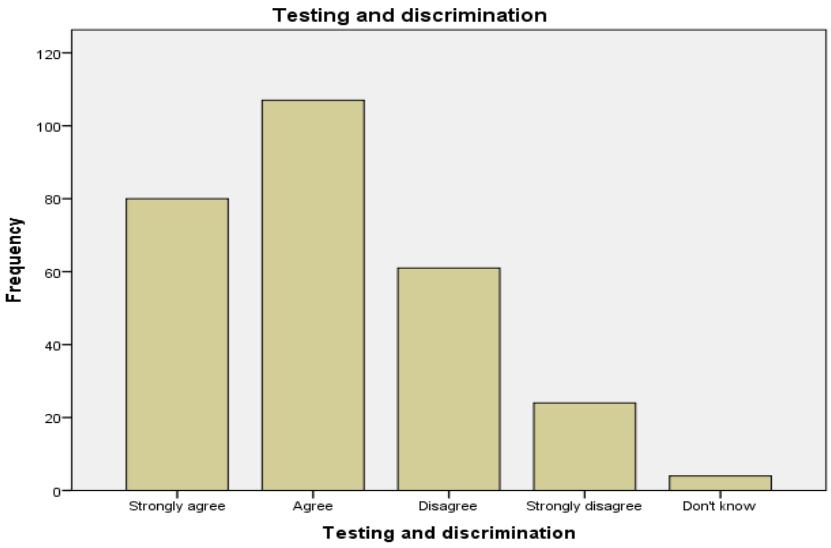

Figure 4. 4: Effect of stigma and discrimination on testing

Apart from the model of testing and stigma and discrimination, to assess the effect of other facility level factors that could play a role, six desirable attributes of a VCT on campus were investigated as a proxy indicator of their possible role as barriers to utilization of services. The findings indicated accessibility of testing site, self-testing and being mobile as being the possible barriers when they fall short of the student's expectations. This is indicated in the table below.

Table 4. 3 Other factors associated with testing

	Should be easily accessible		**Be separately placed from other health services**		**Be a stand-alone site**		**Be mobile**		**Should encourage self-testing**		**Should be opened past work hours**	
	(n)	**(%)**	**(n)**	**(%)**	**(n)**	**(%)**	**(n)**	**(%)**	**(n)**	**(%)**	**(n)**	**(%)**
Agree	266	96.4%	124	44.9	194	70.3	244	88.4	248	89.9	215	77.9
Don't know	5	1.8%	80	29	17	6.2	21	7.6	18	6.5	52	18.8
Disagree	5	1.8%	72	26.1	65	23.6	11	4	10	3.6	9	3.3
	276	100	276	100	276	100	276	100	276	100	276	100

Interest to use the services on campus was also probed. On inquiring whether one would test in a VCT on campus, a majority (93.5%) agreed while only a few (6.5%) said they would not.

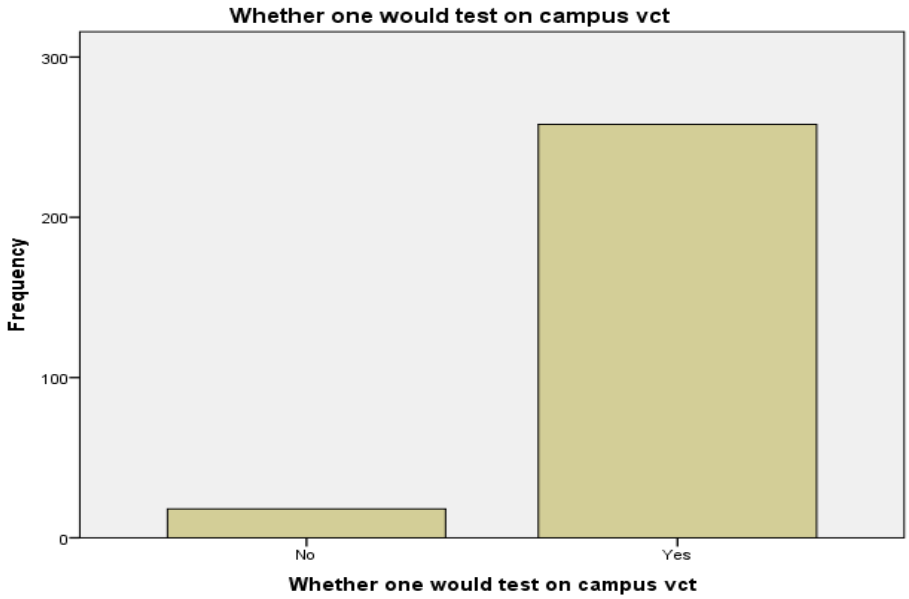

Figure 4. 5: Potential to use of VCT on campus

The study also listed the most likely barriers that deter use of services among the students. This included four factors, two individual-related and two facility-related. As seen in the table below, a majority of the respondents indicated the four factors as common barriers that hinder use of VCT services on campus.

Table 4. 4Barriers to utilization of VCT services in institutional facilities

	Fear to be seen at site		Fear of test result		Accessibility of testing site		Testing hours	
	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)
To a great extent	134	48.6	166	60.1	219	79.3	174	63
To some extent	105	38	91	33	51	18.5	83	30.1
To a lesser extent	28	10.1	16	5.8	5	1.8	8	2.9
To no extent	9	3.3	3	1.1	1	0.4	11	4
	276	**100**	**276**	**100**	**276**	**100**	**276**	**100**

Data from the VCT at JKUAT hospital was reviewed for the period 2010-2016 for 6138 cases that accessed the facility during the period 2010-2016 with the aim of gaining an insight into the utilization rates and the possible reasons that motivated the students to seek the services in the facility. Data review at VCT facilities in both Kenyatta University and The University of Nairobi was not feasibly possible due to procedural bureaucracies as the researcher was only allowed to interview students. Detailed information captured by the counselors in the 'Remarks' section of the JKUAT Hospital's HIV testing and counseling (HTC) laboratory register gave an insight into the several reasons why students sought testing and counseling services. These reported reasons were categorized and tallied as they appeared in the register excluding cases with no comments made about them. Emerging themes from the study indicate that participants utilized the services for different reasons as summarized in Table 4.6.

Table 4. 5 Reasons for testing as seen in VCT Data

Factor	**Frequency (n)**	**Percentage (%)**
Multiple sexual partners	588	38.9
Getting into/out of relationship	234	15.4
Recently engaged in a risky behavior	195	12.9
Exposure after drinking, with sexual worker/sodomy	158	10.4
Testing upon request by partner	87	5.7
Feeling unwell	71	4.7
Routine testing as couple	49	3.2
Seeking PEP after CD bursts	47	3.1
Partner declines to be tested	42	2.8
Pregnancy	13	0.9
Travel abroad	12	0.8
After an alleged rape	7	0.5
Ex-girlfriend recently tested positive	6	0.3
Seeking contraceptives	3	0.2
Accident/stabbed	3	0.2

4.5 Association between socio-demographics of respondents and utilization of services

Cross-tabulation was done and odds ratios calculated to show both the direction and strength of the associations. As seen from the table 4.7 below, the odds ratios showed an association between department and utilization of the services. The students from the health-related departments seemed to have higher odds of testing compared to their non-health related counterparts.

Table 4. 6 Measures of association between socio demographic factors and utilization of VCT services in institutional facilities

Factor	Category	Tested	Did not Test	Odds ratio	95% Confidence Interval	Chi p-value
Age category	18-20	50	104	0.58	0.36, 0.96	0.0327
	21-24	55	67			
Gender	Male	51	84	0.98	0.6, 1.59	0.9291
	Female	54	87			
Marital status	Single	99	169	0.2	0.04, 0.99	0.0481
	Married	6	2			
Department	Health-science	57	79			0.1926
	Non-health-science	48	92	1.38	0.85, 2.25	
Year of study	Junior (1^{st}&2^{nd})	44	89	0.37	0.23, 0.6	0.0001
	Senior (3^{rd},4^{th}&5^{th})	82	61			
Religion	Christian	78	139	0.67	0.87, 1.19	0.1699
	Other	27	32			

The study sought to investigate the association between socio demographic factors and use of VCT services on campus. As indicated by the Chi square test for association, age category and marital status of the respondents proved to be significantly associated with utilization of VCT services with *p values* of 0.032 and 0.029 respectively.

Table 4. 7 Socio demographic factors associated with utilization of institutional VCT services

Variable	Pearson Chi square	Df	p value
Gender	0.08	1	0.929
Age category	4.596	1	0.032
Department	1.702	1	0.192
Year of study	5.354	4	0.253
Marital status	4.774	1	0.029
Faith/religion	4.074	3	0.254

4.6 Themes from FGD's

Three focus group discussions were held at the three Universities. Each FGD had 8 members who were students selected randomly during the interviews. After carefully reviewing the notes taken during the discussions, emerging themes were listed under the main variables measured by the objectives of the study. Analysis of the data collected during the FGD's also yielded relatively similar findings with regard to the factors associated with utilization of testing and counseling services in institutional VCT facilities. Key reasons identified included:

- **Being in a relationship**- One participant from Kenyatta University noted "Those who go to the VCT in one way or another must be in a relationship and are probably sexually active. I know of friends who have insisted to their boyfriends to start the relationship with going for a VCT test. Of course, the University VCT was close by, and so they got tested." This point was repeatedly mentioned as another JKUAT student pointed out "My girlfriend is the one who convinced me to visit the campus VCT, alone, I would have seen no need of testing actually."
- **Desire to know one's HIV status**- A participant commented that "Most people have become aware of the need and importance of knowing their own status. Especially if friends around you all claim to know their status, this pesters you until you are like, well, why not test anyway." Another student

participant had this to say, “There has been a lot of campaign about *‘Jua hali yako’* (Know your status) in the media and this I guess has made most of us see the need of knowing our HIV status”

- **Feeling unwell**- A young lady, 22, noted that “You see if you fall ill, and you haven’t been tested for HIV, the first thing that comes to your mind is to test and exclude HIV from the equation. I bet most students who fall ill start at the VCT in the University before seeking further diagnosis.” This point was repeatedly mentioned in all the discussions. A student participant at the University of Nairobi noted that “Currently whenever you visit the health facility, they ask you to go through the VCT first. So, when one gets ill you have no other choice but to go see a counselor, not a good approach though.”
- **Testing for fun**- A male participant noted, “Some of my classmates are really daring and brag about their HIV statuses. So, this sometimes makes us to go out as a group to just test for fun, though at times it’s not easy.” This seems to be particularly observed mostly in males, as another JKUAT student participating in the discussion had to say, “It is always fun to visit the campus VCT as a group, though the mood that sets in when you get there is not fun any longer. But the whole experience is positive, especially when the test turns out pretty good for you.”
- **Engaging in risky sexual behaviors**- One participant noted that “You see if you mess up when you are drunk after a night out or if you have had this girlfriend of yours and you don’t know each other’s status, it keeps ticking on you that you need to test, until you just give in and go to the VCT.” The same observation was made by a female participant from Kenyatta University who noted “Why would someone who doesn’t ‘play around’ need to test for HIV, in one way or the other, seeking testing and counseling goes hand in hand with that.

CHAPTER FIVE

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter discusses the findings of the study with reference to the relevant literature and information obtained from other studies. The literature review was used for quality control purposes in order to contextualize, compare and inform conclusions of the current study (Flick, 2009). The literature review therefore guided the discussion of the main themes identified from the data analysis. This section discusses the findings of the study with reference to the relevant literature and information obtained from other studies. The discussion of the findings is based on three themes that emerged during data collection.

Recognizing the importance of voluntary HIV testing and counseling in mitigating the impacts of HIV/AIDS, especially among the youths, this study sought to determine the factors associated with utilization of these services among students aged 18-24 years, in selected Kenyan public universities. Uptake of VCT services by university students has been reported to be low. The findings from this study indicated that utilization of institutional VCT services stood at 45%. Whereas 84.4% of students were aware of the presence of these services on their campuses, only 45% of them had ever utilized them. These findings resonate with those of a previous HIV/AIDS assessment from a representative sample of 1,917 university students at Moi University in Eldoret, where rates of voluntary counseling and testing were low (Kitila, 2013).

5.2 Socio-demographic characteristics

The findings of this study showed that several socio-demographic and health service-related factors can be associated with the utilization of HIV VCT services among young people on campus. These are discussed in the section below.

Age

The influence of age on utilization of healthcare services is an important subject. Age is a factor that can be associated with both high and low utilization of services. As seen from the data reviewed in this study, as students age, they seem to utilize the services lesser. Comparing utilization rates among the ages 18-20 and 21-24, the younger category appears to utilize the services in much higher numbers. As seen in table 4.3, there was a significant association between age category and utilization of services. The younger ages are likely to be in their early years at the University and hence it can be argued that they are still exercising their newfound freedom and have not likely succumbed to peer pressure. Another study however reported contradicting results where the rate of VCT uptake was found to be higher among those participants aged 18 years and above as compared to those who were aged below 18 years. This finding might be due to the fact that as the young people grow, they are exposed to VCT and HIV education which make them recognize the importance of knowing their health status (Sanga, Kapanda & Msuya, 2015).

Gender is another factor that seems to affect utilization of VCT services among students. There is a significant association between gender and use of services. The findings also revealed striking patterns where more males than females utilized the services. Findings from a study in Kisii showed that female respondents were seen as having higher utilization of VCT (Epule, *et, al*, 2013) and only 28.1% of respondents had gone with slightly more females (29.9%) than males (26.3%). However, as seen from the descriptive statistics on data reviewed from JKUAT Hospital VCT, more males seem to utilize services more than their female counterparts. That can be explained by the fact that more males seem to encourage themselves to test in groups than do females, and hence their higher prevalence in testing. The findings from focus group discussions during the study hammered this theme more. Participants explained how males in groups dare each other to go and find out their statuses together. This results in a higher number

of males taking up the services. The study also revealed that, in contrast, 46% of women who had been tested reported provider-initiated testing compared to 27% of men. It therefore appears that with regards to testing voluntarily, the males readily take up the services more compared to their female counterparts.

Year of study

This study found out no significant association between the year of study of the respondents and utilization of VCT services. However, it does appear that students in the senior years of study have lesser odds of testing compared to their junior counterparts. This can be explained by the observation where more students aged 18-20 utilized the services more than their older counterparts. This is therefore a common observation for both age category and year of study as the older students are most likely in their senior years while the younger are in the junior years of study. It is therefore clear that the year of study is related to the age of the student and hence as already described above, there seems to be a better health seeking behavior for the young compared to the old. As also observed in a similar study, the respondents in the senior years of study appear not to use services as much as their younger counterparts. Also, similar to the study from Ethiopia, which showed that marital status and academic year of respondents are not influencing HIV testing (Addis, Yalew & Shiferaw, 2013).

Marital status

Marital status of respondents is one of the important factors that influence HIV testing. The results showed significant association between marital status and utilization of services among students. This is however an expected observation since most students within the age category 17-24 are not married and hence the observation. Past study findings have also reported the same results. A study in Ethiopia indicated that those who were not married were more likely to use HIV VCT, (Sisay & Aleyamehu, 2020). A possible reason for this result is that the married believed that they are not infected

because of a partner's trust and being limited to one sexual partner. This is common among married young people and those with good, comprehensive knowledge of HIV/AIDS have been encouraging partners in some way on abstinence and being faithful to one sexual partner.

5.3 Individual level factors impeding VCT utilization

Knowledge of VCT seems to directly affect uptake since those with knowledge of VCT on campus reported a higher utilization. As reflected in the findings from this study, out of the 276 respondents, 97.1% of them were aware of presence of VCT services while only 2.9% had never heard of the VCT services. Of those who are aware of VCT services, 79.1% had ever tested in a VCT and the rest (20.1%) had never used a VCT. Awareness and knowledge of VCT seems to directly affect service utilization. A previous study showed that the rate of VCT uptake was found to increase with the level of education. This is because as the level of education increases, students are being exposed to more education on VCT services and HIV infection which provide them with more confidence of undergoing HIV test but also with some skills on how to avoid HIV infection (Sanga, *et, al*., 2015).

A similar study in Ethiopia on VCT utilization among the young people reported that the chances of VCT utilization among students who knew the test sites were 2.01 times higher than those who did not know it. It further determined that the chances of VCT utilization among knowledgeable students regarding VCT were 1.98 times higher than those with poor knowledge (Sisay & Aleyamehu, 2020). This therefore clearly illustrates that while knowledge and awareness of VCT can be an enabler; it can also be a barrier, especially where people are not aware of the presence of VCT or do not really know the importance of using VCT services.

Findings from a similar study revealed that knowledge of VCT did not show any association with VCT uptake in bivariate analysis 30. This finding was consistence with

the finding of a similar study which was done among the university students in Ethiopia (Addis, Yalew & Shiferaw, 2013). Generally, knowledge about HIV/AIDS and also VCT utilization has positive association. This finding is supported by the assumption that VCT users could have more exposure/information/knowledge regarding HIV/AIDS before they came to VCT centers. This again may indicate the information to be disseminated through health education and counseling sessions may benefit from the inclusion of such topics during the respective sessions, and continuous mass media activity.

Stigma and discrimination

The effect of stigma and discrimination on utilization of VCT services among university students was evident in the results of the study. As seen from Table 4.3, while 29 % of the respondents strongly agreed with the statement that stigma and discrimination affect utilization of VCT services, 38 % agreed to the statement too. This means that a majority of the students still regard perceived or felt stigma as a hindrance to access and utilization of VCT services. The findings concur with results of a study in Ethiopia on the determinants of VCT utilization among the youth. Qualitative result from a Focus Group Discussion indicated that, fear of being seen at a testing site and having health care personnel tell others about their test results were the major reasons that students often regretted to seeking VCT services (Abebaw, 2016).

In one previous study in Tanzania, among the prominent reasons for poor response to VCT was fear of stigmatization from the family and community members. A significant number of the study participants said that, they don't like to go for VCT as they fear from being stigmatized particularly when they are well labeled as HIV victims. This finding is similar to a study conducted in Tanzania-Mwanza, whereby poor response to VCT was associated with fear of stigma (Sanga, 2015).

5.4 Facility level factors affecting service utilization

Apart from the individual level factors discussed above as being the main factors that are affecting service utilization among the students, the findings also indicate other facility level factors that appear to be impeding service utilization. These are accessibility, testing hours, and mobility of the testing facility.

Accessibility

Distance to the VCT center has been found to be among the factors that hindered the decision towards VCT uptake. In a study among secondary school students in Tanzania, participants who reported to reside near the VCT center were more likely to undergo HIV testing than those who reported to reside far (Sanga, 2015). A majority of the students (96%) who responded to the questionnaires reported that **accessibility** of the testing facility can affect to a great extent the utilization of services. Similar findings were found among Malawian and Ugandan youth who described that those services within their reach were more likely to be utilized than when they are far from reach or in a n inaccessible location (Meda, 2013). In a study in Nakuru County, Kenya, on utilization of VCT services among primary school teachers, it was determined that teachers who were perceiving distance to nearest VCT facility as 'not far' were about 1.6 times as likely to take VCT services as those perceiving the distance as 'too far' (ρ-value = 0.068, OR = 1.650, C.I. = 0.810- 3.358). Literature refers to perception as a psychosocial orientation of the mindset that may significantly influence intervention or health-seeking behavior of individuals (Carolyne, Paul & Charles, 2014). Negative perceptions of distance to the nearest VCT facility decreases chances of service utilization among teachers, which should be approached through mobile outreaches and establishing service outlets within residential areas and schools, for easy physical access.

Model of testing

The model of services provision appears to influence utilization of the services provided. About 90% of the study respondents reported that the model of testing does affect its utilization. That a high portion (50.4%) of the respondents is familiar with the mobile testing and counseling model could be an indicator of its higher utilization. One study in

South Africa reported that although three of the models being studied served a similar geographic region, we found more variation than similarities in important client characteristics by HCT model (Mabuto, Latka, Kuwan, Churchyard, Charalambous & Hoffmann, 2014). Mobile units, both those deployed in urban and rural areas, reached a larger proportion of people who had not previously been tested for HIV, but also, were less likely to find HIV positives among those tested. Door-to-door testing removes the obstacle of travel, which is time-consuming and costly. Travelling to reach a health facility imposes both a direct cost (for a mini-bus or bicycle rental), but also the opportunity of costs of hours travelling and waiting to be seen by a health care provider. Another study in Uganda reported that all the three service delivery models in the strudy were being utilized by the FSWs. However, most of the FSWs had HCT services and were linked to care through static facilities compared to the outreaches, and peer to peer mechanism (Pande, *et al*.., 2019). This could be attributed to either cost of travel or the time taken to access the facilities and also the time taken to return to places of residence. Students prefer the VCT services not being too hideous for them to optimally utilize the services provided. It is therefore evident that facilities within reach to students can translate into higher utilization of the services offered.

Testing hours

The effect of testing hours or the time during which the services were being provided was reported as one that affects service use among the respondents. This could be reflected in the fact that a majority (77.7%) of the respondents stated that VCT services should be opened past normal day hours in order to allow more people to utilize the services. This is therefore an indicator of the hours of testing as a possible barrier to utilization of VCT services among the University students. This may be attributed to the fact that either most of the students spend their daytime studying or attending lectures and hence do net get sufficient time to visit the VCT for testing and counseling services or they possibly fear visiting g the facility during the day and hence prefer the might where it is much easier to access the services under the cover of darkness. There seems to have been no study that has explored the role that this factor plays in influencing use

of services in Africa. The closest study that explains the influence of timing of operation hours and its effects on service uptake was on the use of video conferencing to improve service utilization in healthcare settings. The study revealed that access to out-of-hours services proved influential when deciding whether or not to use videoconferencing: uptake of videoconferencing was more likely where staff were dissatisfied with out-of-hours services. This supports existing research, which highlights the importance of developing an intervention that is in line with care priorities to increase uptake and sustainability (Smith, *et al.,* 2018). For example, Goodman (2016) found introducing interventions that support the priorities of the patients ensured they are successfully enacted and utilized. The uptake and sustainability of interventions is supported by the alignment of priorities, which supports the tension for change (Greenhalgh, *et al.*, 2017).

5.5 Conclusions

The results of the study revealed that the utilization rate for VCT services in institutional facilities stood at 45% as at the time of the study. It also emerged that University students seek and utilize services for different reasons and in differing patterns.

i. Higher age category and marital status are individual-level factors that impede use of VCT services among university students. It is clear that for students in the age category 18-24, those in the lower age category 18-20 utilize VCT services more than their older counterparts. The male students also seem to seek testing more than the females, a pattern explained by the fact that more males access VCT facilities as groups rather than alone.
ii. Accessibility and testing hours are the main facility level factors that impede to a great extent utilization of VCT services among students.
iii. The year of study, age category, religion and marital status of students aged 18-24 are significantly associated with utilization of VCT services on campus.

5.6 Recommendations

It is necessary for policy makers in institutions of higher learning together with those tasked with managing healthcare services in these institutions to adopt approaches that will overcome the barriers to utilization of VCT services among students.

i. Gender and age specific strategies like the use of peer counseling and mobilization programs should be put in place in institutions of higher learning to improve utilization of services.
ii. Institutions of higher learning should put in place model VCT facilities that are more accessible and have flexible testing hours to enable more students seek and access services without any barriers.
iii. With knowledge of the socio-demographic factors associated with utilization of VCT services in institutional facilities (age-category, marital status & year of study), VCT services on campus should develop more youth-friendly services to improve utilization.

More research should also focus on the persisting risky sexual behaviors among university students despite the increased knowledge they have on HIV/AIDS.

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APPENDICES

Appendix I: Budget

	Item/activity	**Quantity/units**	**Cost per unit**	**Total cost**
1	Foolscaps	2 reams	500	1,000
2	Files	5	100	500
3	Pens	10	20	200
4	Storage device (Disk drive)	1	2,000	2,000
5	Library	10 sessions	100	1,000
6	Internet	100 sessions	200	20,000
7	Typesetting	60 pages for two sets	50	6,000
8	Printing	60 pages for 20 sets	10	12,000
9	Photocopy	60 pages for 20 sets	5	6,000
10	Binding	20 sets	100	2,000
11	Transport	50 trips	200	10,000
12	Ethical approval	1	5,000	5,000
13	SPSS software	1	2,500	2,500
14	Data analysis aid	2	5,000	10,000
15	Consultations	5	500	2,500

16	Miscellaneous expenses	10	500	10,000
17				
18				
			Total Expenditure=	**Ksh 108,200**

Appendix II: Work plan

	Identification of concept	Research proposal development	Proposal defense and improvement	Ethical clearance	Data Collection and Analysis	Report writing	Thesis Defense and refinement	Final Report
Aug 2016								
Sept 2016								
Oct 2016								
Nov 2016								
Dec 2016								

Jan 2017							
Feb 2017							
Sept 2021							
Oct 2021							

Appendix III: Questionnaire

Instructions

This questionnaire aims at collecting data on the **barriers to utilization of institutional voluntary HIV testing and counseling services among students aged 18-24 in selected public Universities in Kenya.** You are requested to respond to the questions below. Information obtained on this questionnaire is for the purpose intended and ultimate confidentiality will be maintained.

Section A: Demographic information (tick where appropriate)

1. Gender Male [ ] Female [ ]
2. Age [ ] Years
3. Religion …….....
4. University …….....
5. Department ……
6. Year of study [ ]

Section B: Uptake of HIV test

7. Have you **ever been tested** for HIV/AIDs? YES [ ] NO [ ]

If YES,

a. How many times…….

b. **Why** did you choose to get tested?

Own volitions [ ]

Persuaded by friends/relatives/partner [ ]

Initiated by health care provider [ ]

Fulfilling a requirement [ ]

Others (specify)……. [ ]

c. **When** were you **last tested**?

Less than three months ago [ ]

Less than Six Months ago [ ]

Less than One year ago [ ]

Less than Two years ago [ ]

More than two years ago [ ]

If NO, why? ……

Section C: Model of testing and factors associated with uptake of testing

8. Have you heard about VCT for HIV? (Voluntary counseling and testing)?

YES [ ] NO [ ]

9. **Are you aware** of the presence of VCT services in your university campus?

YES [ ] NO[ ]

If YES, where did you get information about it?

.....

10. Have you **ever sought testing** at the facility? YES [ ] NO [ ]

11. If No, **why**?

…….....

……

…….……...…….

12. Please Tick any other model of testing that you have ever utilized or seen being utilized.

a. Health facility testing and counseling. [ ]

b. Mobile Testing and counseling. [ ]

c. Self-testing. [ ]

d. Moonlight testing and counseling. [ ]

13. Do you think the different models of testing have an influence on your uptake of HIV test?

YES [ ] NO [ ]

14. People who test HIV positive are likely to be treated differently or discriminated against. (Tick one)

[1]=Strongly Agree

[2]=Agree

[3]= Disagree

[4]= Strongly disagree

[5]=Don't know

15. In your opinion what characteristic would you like a VCT model at a University campus to possess? (Please tick against the scale provided to indicate rank)

Characteristic	**(Agree Indifferent Disagree)**
Be easily accessible	**(**Agree, Don't know, Disagree)
Be separately placed from other health services	**(**Agree, Don't know, Disagree)
Be a standalone site	**(**Agree, Don't know, Disagree)
Be mobile for access	**(**Agree, Don't know, Disagree)
Should encourage one to test him/herself	**(**Agree, Don't know, Disagree)
Be opened even past working hours	**(**Agree, Don't know, Disagree)

16. Would you go for a test in a VCT facility in your institution? YES [ ] NO [ ]

17. If NO, give reason……

……

18. State to what extent each of these can make someone not to go for an HIV/Test in the University? (Tick appropriate)

	Great extent	Some extent	Lesser extent	No extent
1. Fear to be seen at the VCT site				
2. Fear of a test result				
3. Accessibility of the testing site				
4. Testing hours				

19. State two aspects you would like changed or improved in the way HIV/AIDs Voluntary testing and counseling services are conducted in university campuses to achieve more uptakes?

1……

2……

This is the end of the questionnaire. Thank you for taking your time to respond to this questionnaire, the information that you have provided will go a long way in helping improve VCT services in university settings.

……...……Thank you for your precious time……

Appendix IV: Focus Group Discussion Guide

FGDs interview guide for students aged 18-24, on barriers to uptake and utilization of institution based VCT services.

Participant:

1. Young people knowledge on HIV and AIDS. (Probes: cause of HIV, ways of transmission,

differences between HIV & AIDS, prevention of HIV infection, and treatment possibilities)

2. Young people understanding about VCT. (Probes: accessibility).

3. Young people experiences in utilizing VCT services. (Probes: attitudes, perception to facilities, counselors, and services provided).

4. What do undergraduate students think about VCT services offered at universities?

5. Young people opinions on VCT services. (Probes: quality of counseling, confidentiality keeping, costs, treatments of STDs).

6. Factors behind youths seeking facilities that offer services on HIV counseling and testing in university campuses. (Probe: Do boys and girls look for the same things in VCT?).

7. Why students do not seek the VCT services offered at campuses compared to other sites? (barriers)

8. General comments about VCT sites and their services in relation to youth's consumptions.

(What is your preferred age of the counselors and why? and location of site)

9. What can be done to improve and make VCT services offered at universities acceptable to young people? (Possible strategies and approaches)

END

Appendix V: Consent Form

Consent to participate in research

Barriers to utilization of institutional voluntary HIV testing and counseling services among students aged 18-24 in selected Kenyan public Universities

You are asked to participate in a research study conducted by Kirui Caliph Cheruiyot, a Master of Public Health Student from Jomo Kenyatta University of Agriculture and Technology. You were selected as a possible participant in this study because the study is targeting undergraduate students aged 18-24 from public Universities in Kenya.

PURPOSE OF THE STUDY - To determine the barriers to uptake of institution based voluntary HIV testing and counseling services among undergraduate students aged 18-24.

PROCEDURES - If you volunteer to participate in this study, I would ask you to do the following things:

To read through the informed consent.

And if agreeable you sign the consent.

Complete the questionnaire and hand it back to the researcher Kirui Caliph Cheruiyot.

The questionnaire can be completed during your own spare time.

POTENTIAL RISKS AND DISCOMFORTS - 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. There may be potential risks and discomfort in the form of emotional distress during and after the study. If you experience discomfort in the form of emotional distress during and after the study you will be referred to a Counselor for counseling. In that case my contacts are available on the questionnaire and so don't hesitate to get in touch with me so that you can be referred to the University counselor.

POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY -

There is no payment for participating in this study. However, the results will be used to assist in formulating policies and strategies that may lead to improvement of quality of VCT services offered in public universities in Kenya. The body of knowledge generated could enhance the way VCT services are delivered in university campuses and hence aid in stemming the epidemic in this highly productive population.

CONFIDENTIALITY- Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law. Confidentiality will be maintained by means of use of code numbers and not names. Information collected from them will be treated confidentially with no invasion of privacy, kept under lock and key cupboard and only used for the purpose it was collected for. The results of the study will be given to the authorities of the institutions for the participants to be able to access them.

PARTICIPATION AND WITHDRAWAL

You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may also refuse to answer any questions you do not want to answer and still remain in the study.

IDENTIFICATION OF INVESTIGATORS

If you have any questions or concerns about the research, please feel free to contact the following,

Kirui Caliph Cheruiyot: Principal Investigator cell **0700800177**/xkirca@yahoo.com

or

Dr. Patrick Mburugu: The Supervisor cell **0722347119** /mburugu3mp@yahoo.com

RIGHTS OF RESEARCH SUBJECTS - You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal claims, rights or remedies because of your participation in this research study. If you have questions regarding your rights as a research subject, contact Dr. Magu Dennis, at 0722574388/ gcidennis@yahoo.com, **JKUAT.**

In case of any other ethical concerns, you can contact the Secretary, Kenyatta National Hospital Ethics and Research Committee, Postal box number 19676-00202, uonknh_erc@uonbi.ac.ke

Legal Rights and Signatures:

I_____ consent to participate in the above-mentioned study conducted by Kirui Caliph Cheruiyot. I have understood the nature of this project and

wish to participate. My signature below indicates my consent and will not be linked to my answers.

Signature -_____Date_____

Participant

Appendix VI: Principal Investigator Confidentiality Agreement

Barriers to utilization of institutional voluntary HIV testing and counseling services among students aged 18-24 in selected Kenyan public Universities

I, Kirui Caliph Cheruiyot, agree to maintain full confidentiality when performing the tasks in this study.

Specifically, I agree to:

1. Keep all research information shared with me confidential by not discussing or sharing the information in any form or format (e.g., disks, tapes or transcripts)
2. Hold in strictest confidence the identification of any individual that may be revealed during the course of performing the research tasks;
3. Keep all raw data that contains identifying information in any form or format (e.g., disks, tapes, transcripts) secure while it is in my possession. This includes:
    - Keeping all digitized raw data in computer password-protected files and other raw data in a locked file;
    - Closing any computer programs and documents of the raw data when temporarily away from the computer;
    - Permanently deleting any e-mail communication containing the data; and using closed headphones if transcribing recordings;

Name _____

Address_____

Telephone number: _____

Signature_____ Date _____

Appendix VII: Research Assistant Confidentiality Agreement

Barriers to utilization of institutional voluntary HIV testing and counseling services among students aged 18-24 in Kenya's public Universities

I, _____, agree to assist the primary investigator with this study by _____

[List research tasks]. I agree to maintain full confidentiality when performing these tasks.

Specifically, I agree to:

4. Keep all research information shared with me confidential by not discussing or sharing the information in any form or format (e.g., disks, tapes, transcripts) with anyone other than the primary investigator;
5. Hold in strictest confidence the identification of any individual that may be revealed during the course of performing the research tasks;
6. Not make copies of any raw data in any form or format (e.g., disks, tapes, transcripts), unless specifically requested to do so by the primary investigator;
7. Keep all raw data that contains identifying information in any form or format (e.g., disks, tapes, transcripts) secure while it is in my possession. This includes:
    - Keeping all digitized raw data in computer password-protected files and other raw data in a locked file;
    - Closing any computer programs and documents of the raw data when temporarily away from the computer;
    - Permanently deleting any e-mail communication containing the data; and
    - Using closed headphones if transcribing recordings;
8. Give, all raw data in any form or format (e.g., disks, tapes, transcripts) to the primary investigator when I have completed the research tasks;

9. Destroy all research information in any form or format that is not returnable to the primary investigator (e.g., information stored on my computer hard drive) upon completion of the research tasks.

Name_____ Address_____

Telephone number_____

Signature of research assistant_____ Date _____

Name of primary investigator_____ Signature_____

Appendix VIII: Ethics Approval Letter

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

KNH-UON ERC
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Facebook: https://www.facebook.com/uonknh.erc
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KENYATTA NATIONAL HOSPITAL
P O BOX 20723 Code 00202
Tel: 726300-9
Fax: 725272
Telegrams: MEDSUP, Nairobi

Ref: KNH-ERC/A/205

June 8th 2018

KENYATTA NATIONAL HOSPITAL APPROVED 08 JUN 2018 KNH/UoN-ERC P.O. Box 20723-00202 NRB.

Alex Ndambuki Musyoka
Reg. No.TM 310-3144/2015
School of Public Health
College of Health Sciences
J.K.U.A.T

Dear Alex

RESEARCH PROPOSAL – RISK FACTORS OF MALNUTRITION AMONG CHILDREN AGED 6-59 MONTHS ATTENDING KAJIADO EAST SUB COUNTY HOSPITAL (P169/03/2018)

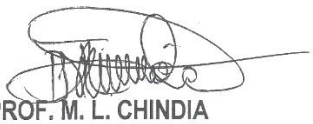
This is to inform you that the KNH- UoN Ethics & Research Committee (KNH- UoN ERC) has reviewed and **approved** your above research proposal. The approval period is from 8th June 2018 – 7th June 2019.

This approval is subject to compliance with the following requirements:

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

For more details consult the KNH- UoN ERC website **http://www.erc.uonbi.ac.ke**

Yours sincerely,



PROF. M. L. CHINDIA
SECRETARY, KNH-UoN ERC

c.c. The Principal, College of Health Sciences, UoN
The Deputy Director, CS, KNH
The Chairperson, KNH-UON ERC
The Assistant Director, Health Information, KNH
Supervisors: Prof. Gideon M. Kikuvi, Dr.Florence M. Kyallo