

# Risk Factors Associated with HIV Counselling and Testing among Undergraduate Students at the College of Health Sciences at the University of Nairobi, Kenya

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## Abstract

**Background:** The human immunodeficiency virus infection and acquired immune deficiency syndrome epidemic remains a burden worldwide and young people constitute the majority of the burden. Establishing factors that influence the uptake of HIV counselling and testing among young people is mandatory to reduce HIV incidences, and hence help to prevent and control the epidemic.

**Objective:** The aim of this study was to determine factors associated with the uptake of HIV counselling and testing among undergraduate students at the University of Nairobi, College of Health Sciences.

**Methods:** An analytical cross-sectional study was conducted at the University of Nairobi, College of Health Sciences among undergraduate students. Multi-stage sampling technique was used to select participants and a mobile tablet device-based questionnaire on the Open Data Kit application was used to collect data. Univariable logistic regression was performed by using STATA software version 11.2.

**Results:** Factors that were independently associated with the uptake of HIV counselling and testing among the participants were; privacy of the location of the Voluntary Counselling and Testing center (AOR:8.1; 95%CI:2.7-24.6;  $p < 0.01$ ), peer influence (AOR:1.6; 95%CI:1.0-2.4;  $p = 0.05$ ), duration in the academic programme (AOR:0.77; 95%CI:0.25-2.28;  $p = 0.03$ ), and whether the participants were sexually active or not (AOR:2.1; 95%CI:1.3-3.2;  $p < 0.01$ ).

**Conclusion:** Privacy during counselling and peer influence are among the risk factors which need to be addressed to increase the uptake of HIV Counselling and Testing.

**Keywords:** risk factors, counselling, and testing, undergraduate

## 1. Introduction

On the report of the Joint United Nations Programme on HIV/AIDS, indicated that there are approximately 36.9 million people worldwide who are currently living with HIV/AIDS, includes 3.9 million young people aged 15–24 years (UNAIDS, 2017). However, 25% of these individuals do not know their HIV status (UNAIDS, 2017). In addition, in 2017 the WHO African Region was reported as the most affected region, with an estimated number of 25.7 million individuals living with HIV. In Africa, Sub-Saharan Africa (SSA) is the most affected region with the highest overall HIV prevalence being among adult populations aged 15–49 years. Kenya as part of the countries in SSA has been affected by a generalized HIV/AIDS epidemic with an estimated national HIV prevalence of 4.9%, in which females are 5.2% and males are 4.5%. There were an estimated 1.5 million individuals of all ages living with HIV in 2017, which included 12% of young people aged 15–24 years of age (females 2.6% and males 1.3%) as reported by Kenya HIV Estimates report (National AIDS and STI Control Programme [NASCO], 2018). HIV counselling and testing (HCT) is an important entry point to HIV prevention, treatment, care, and support services, and early treatment initiation greatly reduces AIDS-related symptoms and the rates of transmission (World Health Organization [WHO], 2015). According to WHO (2015), HIV/AIDS prevention interventions include HIV counselling and testing, which is known as the backbone and entry point to treatment, and comprehensive HIV/AIDS infection prevention programmes among infants, women, young people, and the whole population at

large. Access to HCT consequently aids in early HIV detection and minimizes incidents of HIV infection; hence preventing and controlling the transmission of the epidemic. Young adults are one of the most exposed populations to HIV infection and they significantly contribute to the high HIV prevalence in many countries which are deeply rooted in the epidemic. In Kenya, the report indicates that 33% of all new HIV infections in 2017 occurred among adolescents and young people aged 15–24 years [NAS COP], 2018). Age distribution plays a significant role in predicting the uptake of HCT and according to Sanga et al., (2015) the uptake of HCT increases as the age advances because of increased exposure to voluntary counselling and testing (VCT) and HIV education of young people as they grow. This makes them realise the significance of knowing their HIV status. In their study on predictors of HIV/AIDS Knowledge and Attitude among Young Women of Nigeria and Democratic Republic of Congo, Gebremedhin, Youjie, & Tesfamariam, (2017), concluded that HIV/AIDS knowledge does increase with age. The authors found that women of 20–24 years of age had more HIV knowledge compared to women of 15–20 years.

In addition, studies done by Abiodun et al., (2014); Chimoyi et al., (2015); Hadish et al., (2017), suggested that older individuals are more likely to use HCT services as opposed to the younger ones. It might be that older people perceive themselves to be at high risk of acquiring HIV virus and will therefore readily access HCT service. However, with advanced age, individuals may also become more educated hence increasing the awareness and economic stability to go for HIV testing (Hadish et al., 2017). Many studies have found sex to be associated with the uptake of HCT as alluded to by Asaolu et al., (2016); Khawcharoenporn, Chunloy, & Apisarnthanarak, (2016); Woldeyohannes et al., (2017), who reported that male youth had lower odds of HCT uptake as compared to females. This concurred with findings from a study by Chimoyi et al., (2015) to the effect that females were more likely to be tested for HIV as compared to males. This may be attributed to the fact that females have a window opportunity for HCT uptake during Antenatal Care (ANC) and hence this increases their odds ratio for HCT uptake. Therefore, this study seek to determining the factors that influence young people to uptake HCT is important for early HIV detection hence avoiding increased HIV prevalence (Kenya AIDS Strategic Frame Work [KASFW], 2014).

## 2. Materials and Methods

The study employed analytic cross-sectional design study, this method was used to provide facts about risk factors which influence HIV counselling and testing uptake among 4732 undergraduate students aged 17–26 years at the College of Health Sciences of University of Nairobi, Kenya. The calculated sample size using sample size calculator by Raosoft® was 390. Multi-stage sampling technique was used in selecting participants for the study. The study participants were then systematically sampled, in which every 12<sup>th</sup> student was picked up from the list of the students from each of the school by year of study. The consent forms were given to all, and the questionnaire was then loaded onto the Open Data Kit (ODK) phone-based software for data collection and STATA software was used to analyse collected data, at significance level (p-value) = 0.05

## 3. Results

### 3.1 Socio-Demographic Characteristics

From the total of 390 study participants required for the study, 386 were interviewed, resulting in a response rate of 99.0%, other demographic characteristic is show in Table 1

Table 1. Socio-demographic characteristics of study participants (N=386)

Characteristics	Mean $\pm$ (SD)	Frequency n (%)
<b>Age (years)</b>	21.57 (2.0)	
<b>Sex</b>		
Male		189 (48.9)
Female		197 (51.1)
<b>Marital status</b>		
Never married		368 (95.3)
Married		10 (2.6)
Others		8 (2.1)

<b>Religion</b>	
Non-Christian	80 (20.7)
Christian	290 (75.1)
Not religious	16 (4.2)
<b>Residence of origin</b>	
Urban	222 (57.5)
Rural	164 (42.5)
<b>Family head income/month</b>	
<50,000 KES	111 (28.8)
50,000KES to 100,000 KES	146 (37.8)
>100,000KES	129 (33.4)
<b>Field of study</b>	
Nursing	35 (9.1)
Dental	23 (6.0)
Pharmacy	55 (14.3)
Medicine and Surgery	221 (57.3)
Biochemistry	29 (7.5)
Medical lab	23 (6.0)
<b>Year of study</b>	
1 <sup>st</sup>	74 (19.2)
2 <sup>nd</sup>	112 (29.0)
3 <sup>rd</sup>	96 (24.9)
4 <sup>th</sup>	52 (13.5)
5 <sup>th</sup>	32 (8.3)
6 <sup>th</sup>	20 (5.2)

*SD (standard deviation).*

### 3.2 Health Service Delivery Related Factors Influencing Participants Visit to HCT

Most participants reported that their decision to visit HCT was influenced by the privacy and location of VCTs (92.0%), confidentiality and privacy at the VCT site (87.6%), the quality of health services (85.5%), and waiting time at the VCT site (83.2%) as seen on Table 2.

Table 2. Reported health service delivery related factors influencing HCT uptake (N=386)

Characteristic	Influenced n (%)	Not influenced n (%)
Private location of VCT	355 (92.0)	31 (8.0)
Confidentiality and privacy at VCT site	338 (87.6)	48 (12.4)
Quality of health services	330 (85.5)	56 (14.5)
Waiting time at VCT site	321 (83.2)	65 (16.8)
Availability of ART at VCT site	296 (76.7)	90 (23.3)
Distance to the health facility	288 (74.6)	98 (25.4)
Financial cost involved	286 (74.1)	100 (25.9)

Table 3. Univariable logistic regression analysis of health service delivery related factors affecting HCT uptake among undergraduate students (N=386)

Variable	Crude	95% CI	LRT
	Odds Ratio	Lower- Upper	p-value
<b>Availability of ART at VCT site</b>			
Influenced	1.30	0.80 - 2.10	0.28
Not influenced	ref		
<b>Waiting time at the VCT site</b>			
Influenced	1.46	0.84 - 2.51	<b>0.17*</b>
Not influenced	ref		
<b>Quality of health services at VCT site</b>			
Influenced	1.07	0.61 - 1.89	0.81
Not influenced	ref		
<b>Confidentiality and privacy at VCT site</b>			
Influenced	1.49	0.80 - 2.79	<b>0.19*</b>
Not influenced	ref		
<b>Distance to the VCT site</b>			
Influenced	1.13	0.71 - 1.79	0.61
Not influenced	ref		
<b>Private location of the VCT</b>			
Influenced	6.49	2.22 - 18.93	<b>0.001*</b>
Not influenced	ref		
<b>Financial cost involved</b>			
Influenced	1.25	0.79 - 1.98	0.34
Not influenced	ref		

\*Significant variable at  $p < 0.05$ . Likelihood Ratio Test (LRT).

The seven variables: *age, year of study, peer influence to go for HCT, waiting time at the VCT site, confidentiality, and privacy at the VCT site* and *private location of the VCTs* were statistically significantly associated with HCT uptake in the univariable analysis were fed into the multivariable logistic regression model.

The rate of HCT uptake increased with VCT site being privately located. Participants whose decision making to go for HCT was influenced by the private location of the VCT site were 8.09 times more likely to go for HCT (AOR:8.09; 95%CI:2.66-24.57;  $p < 0.01$ ) compared to those who were not influenced by the location of VCT, controlling for year of study, sexually active and peer influence to undergo HCT.

#### 4. Discussion

The main objective of this study was to determine risk factors associated with the uptake of HIV counselling and testing among undergraduate students at the College of Health Science at the University of Nairobi. The prevalence of HCT uptake in the last 12 months prior the study among university students at the College of Health Science in this study was only 46.1%. Majority of participants (93.0%), however knew where to go for HCT services. A study on HCT uptake among students at the universities of Nairobi, Egerton, Daystar, and African Nazarene in Kenya reported a HCT uptake prevalence of 50.7% (Mwangi et al., 2014). The reported prevalence of HCT uptake in this study is slightly high compared to 35.4% among undergraduate students at Bahidar University in Ethiopia (Fikadie et al., 2014), 34.6% among health care professional students in Tanzania (Charles et al., 2009), and 30.4% among university students in Nigeria (Abiodun et al., 2014). The poor uptake of HCT may imply that the university students have the potential to unknowingly infect others with HIV related diseases. Although fear associated with knowing the HIV test results was not significantly associated with HCT uptake, participants in this

study mentioned it as one of the main barriers to HCT uptake. Similar findings on fear and HCT uptake were reported from Zimbabwe (Sambisa, 2008).

In this study, factors that were independently associated with the uptake of HIV counselling and testing among undergraduate students at the College of Health Science at the University of Nairobi were privacy of the location of VCTs, peer influence, the duration in the academic programme, and whether the participants were sexually active or not. Participants were more likely to go for HCT if the VCT location was privately located. These findings on the privacy of the VCT location could be attributed to fear of stigmatization by peers (Sanga et al., 2015). In this study, however, there was no statistically significant association between stigmatization and HCT uptake. It is therefore possible that students in this study preferred private VCT location compared to the public facilities within the university where they also conduct their clinical practices. These findings are supported by systematic review study work in Sub-Saharan Africa by Musheke et al., (2013) which explained that perceived poor location of HIV testing site is associated with low HCT uptake as it brings negative connotations such as being labelled HIV positive, sexually active or being infected by other STIs.

Being sexually active was also significantly associated with HCT uptake in this study. These findings suggest that individuals who are sexually active perceived themselves to be at a higher risk of contracting HIV infection, hence they are more likely to go for HCT. Participants who were sexually active were 2.05 times more likely to have undergone HCT in the last 12 months prior to the study compared to those who were not. Similar findings were reported from Sub-Saharan Africa and Ethiopia (Asaolu et al., 2016; Tsegay et al., 2013).

The HCT uptake among participants also increased with the year of study. Participants from the final year (6<sup>th</sup> year) were more likely to go for HCT visits than those at the beginning of the academic programme. Although these findings might be attributed to the increase in source and access to HIV related information, there was no statistically significant association between HIV-related awareness and HCT uptake, despite the reported high level of awareness about HIV/AIDS modes of transmission, preventions, and treatment. The increase in HCT uptake with the students' duration in the medical education programme could therefore be attributed to independence, freedom, as well as sexual maturity accompanied by possibility of more relations with opposite sex may lead to heightened sexual activities which tend to increase with the length of stay on campus, subsequently increasing perceived risk to HIV infection. Similar findings were reported from Ethiopia, which show that as students stay longer on campus, the HIV exposure risk perception increases and thus senior students are likely to have increased access to VCT related information compared to first year students (Fikadie et al., 2014).

Although only slightly more than half of participants (57.3%) indicated that they would not seek approval from anyone when going for HCT services, peer influence was positively associated with HCT uptake in this study. It is possible that peer pressure or family influence may help one to gather courage and strength to go for VCT. Individuals with supportive families and friends have been known to have a higher HCT uptake compared to those who lack support from families and friends (Fikadie et al., 2014). Peers have also been known to be the primary sources of information on HIV infection and HCT (Fikadie et al., 2014; Lubogo et al., 2015). Hence, individuals whose family members and friends have previously visited VCT sites are more likely to go for HCT.

There was no statistically significant association between HCT uptake and participants' demographic and socio-economic factors of age, sex, religion, residence, socio-economic status, and marital status. These findings are almost similar with previous studies conducted in Tanzania, Ethiopia, and Thailand among university students (Charles et al., 2009; Khawcharoenporn et al., 2016; Tsegay et al., 2013). Furthermore, specific disciplines were not associated with HCT uptake, and probably because participants had the same medical educational background. Similar observations have been made in Tanzania (Charles et al., 2009).

Among the health service delivery factors, only privacy of the VCT location was significantly associated with HCT uptake. Perceived confidentiality and privacy at the VCT site and HCT uptake were not significantly associated. However, 87.7% of the participants were influenced by confidentiality and privacy at VCT site, this indicates that lack of confidentiality and privacy at VCT site could be an obstacle to HCT uptake. Similar findings were reported from Ethiopia (Tsegay et al., 2013). The influence of quality of HIV testing services offered at the VCT site was also not associated with the uptake of HCT. Most of participants (85.5%) indicated that they were influenced by the perceived quality of health services offered at the VCTs. This may stipulate that poor quality of health services offered at VCTs could cause a reduction on the number of participants' turn up for HCT. Similar results were observed in a related systematic review study conducted in Sub-Saharan Africa (Musheke et al., 2013). Furthermore, majority of participants (83.2%) self-reported that short waiting time at VCT determined their desire to go for HCT, however the influence did not make a difference in the uptake of HCT. This may suggest that perceived long waiting time at the VCTs could result in low uptake of HCT. These findings are in sync with

findings from Tanzania and Zimbabwe (Meremo et al., 2016; Sambisa, 2008). Knowing that ART was available at the VCT site was also not associated with HCT uptake in this study. However, majority of participants (76.7%) appeared to have been influenced by the knowledge of the availability of ART. This may show that lack of ART availability at the VCT site, may result in the reduction of HCT uptake. Similar results were noted in Ethiopia (Tsegay et al., 2013).

## 5. Conclusion

According to the findings, the factors that were independently associated with HCT uptake were: privacy of the location of VCT centers, peer influence and the duration in the academic programme. Therefore, findings from this study suggested that privacy of the VCT location was the most significant factor that facilitated the HCT uptake among the study participants.

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## Competing Interests Statement

The authors declare that there are no competing or potential conflicts of interest.

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