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Walden University

College of Health Sciences and Public Policy

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Lilian Belole Motia Pencille

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Walden University
2023

Abstract

HIV Testing and Counseling Uptake Predictors Among University Students in Southwest Cameroon

by

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MSW, The University of Georgia, 2005

BA, Paine College, 2001

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Health

Walden University

February 2023

Abstract

Despite public health efforts to increase human immuno-deficiency virus testing and counseling (HTC) uptake, screening among college students remains low and understudied. The purpose of this cross-sectional correlational quantitative study was to explore the relationship between the constructs of the health belief model (perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy) and HTC uptake while controlling for age, sex settlement type, relationship status, area of residence, religious affiliation, and level of education. Four hundred and eighty-seven (N = 487) university students in Southwest Cameroon were recruited using a convenience sampling method. Data were collected using the Survey Monkey online platform. Bivariate and multivariate logistic regression analyses were conducted to explore the relationship between the dependent variable and the independent variables. The results indicated that perceived barriers (OR = 1.134; $p < 0.011$), cues to action (OR = 1.112; $p = 0.044$), and self-efficacy (OR = 1.405; $p < 0.001$) were statistically significant predictors of HTC uptake while perceived susceptibility (OR = 1.104; $p = 0.086$), perceived severity (OR = 1.043; $p = 0.500$), and perceived benefits (OR = 1.066; $p = 0.434$) were not statistically significantly associated with HTC uptake. Having knowledge of factors that impact university students' HTC uptake can assist in designing programs and interventions thereby creating public health policies. Potential positive social change impact of this study is to provide interventions to increase engagement in HTC and reduce the number of people infected with HIV/AIDS.

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Dedication

This dissertation is dedicated to the Almighty God for giving me strength and guidance through this process. I also dedicate this dissertation to my grandmother Frida Nyambako Nwanja who loved me unconditionally and established a strong foundation of who I am today, to my husband John Mark Pencille and our children Heaven Pencille, Trinity Pencille, John Mark Pencille II, and Ethan Pencille.

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Chapter 1: Introduction of the Study

Globally, human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS) continues to be a significant public health problem. The World Health Organization (WHO, 2022) reported that as of 2020, out of the 37.7 million people living with HIV (PLHIV) globally, 25.4 million of the population were living in Africa, and Africa accounted for 60% of new HIV infections in the world. The WHO (2016) also reported that in 2014, there were 924 HIV testing and counseling (HTC) facilities in Cameroon, with an estimated number of 27 HTC facilities per 100,000 adult population. Cameroon Population-Based HIV Impact Assessment (CAMPHIA; 2020) reported that in a study conducted between July 2017 and February 2018 in Cameroon, out of about 500,000 adults (37%) living with HIV, 5% were women, and 2.3% were men. UNAIDS (2017c) reported that in 2016, though there were 27 HTC facilities per 100,000 people, 63.2% of the Cameroon population between the age of 15 and 24 knew about HIV prevention.

The prevalence of HTC among university students of southwest Cameroon is crucial as it measures the percentage of the population in Southwest Cameroon who patronize HTC services. It is calculated by finding the percentage of people being tested for HIV within the past 12 months. According to President's Emergency Plan for AIDS Relief (PEPFAR; 2019), the prevalence rate for HIV in Cameroon in 2018 was 3.4%, while in Southwest Cameroon, the university where the study was conducted has a prevalence rate of 3.6% (CAMPHIA, 2020). Determining the prevalence of HTC in the study target population in SW Cameroon will enable researchers and decision-makers to

know the current status of the target population in SW Cameroon regarding achieving the 90-90-90 United Nations goals.

HTC among students in a southwest university in Cameroon focused on determining the prevalence and rate at which HTC is practiced among students in a Southwest university in Cameroon. The topic has a dependent variable as HTC uptake, and the constructs of the health belief model (HBM) are considered as the independent variables that influence the uptake of HTC. Identifying predictors of HTC uptake in Southwest Cameroon is paramount in the battle to reduce the high rates of HIV/AIDS within the study target population within this region. Therefore, the study examined the relationship between perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy to help interpret findings that play a role in the uptake of HTC. There was a need to conduct the current study, as Cameroon is still counted to have a high prevalence of HIV (Khalifa et al., 2019). Therefore, there is a need to put an end to the HIV epidemic and ultimately attain the Sustainable Development Goal (SDG) 3, specifically Target 3.3, which calls for an end to the AIDS epidemic by 2030 (UNAIDS, 2017a; World Health Organization [WHO], 2018).

In achieving this goal as a country, HTC is essential in identifying people with HIV so antiretroviral therapy (ART) can be initiated immediately and viral loads reduced to eliminate HIV transmission. Knowing the factors that influence HTC uptake among the study participants through the current study results, researchers and decision-makers will be aware of what motivates people to go for HTC services. They would also be aware of what deters others from going for HTC services. Based on this knowledge,

recommendations would therefore be made to address the underlying factors that lead to the reluctance in the uptake of HTC services. The study has also added to the literature as the current prevalence of HIV among students in a Southwest university in Cameroon has been determined. The study has informed decisions and educational interventions encouraging engaging in HTC services. The study has also influenced health-based educational activities on the need for university students to take up HTC services and has identified the barriers associated with HTC uptake.

HTC continue to be an advanced preventive strategy and the gateway to care, treatment, and rehabilitation of HIV/AIDS patients (De Cock et al., 2019). Cameroon being inclusive of the countries with the largest HIV prevalence (Khalifa et al., 2019) requires that intervention, including HTC, be put in place to achieve a reduction in the prevalence of HIV. Though HTC plays a vital role in HIV control, access to services for HTC in Sub-Saharan Africa (SSA) continues to be inadequate (Nnko et al., 2019). Desta et al. (2017) also stated that most youths do not express willingness or interest in engaging in HIV testing due to personal and psychological factors. Based on those reasons, I sought to determine the prevalence of HTC and the predictors of HTC using the constructs of the HBM. It was essential to ascertain the factors that motivated some and deterred others from going for HTC services; therefore, recommendations towards achieving the 90-90-90 United Nations goals were provided.

The findings also provided data for further research on HTC service uptake and predictors among university students, young people, and related issues. Again, the study added to the existing literature on HTC uptake among the youth. Chapter 1 includes the

HTC background, problem statement, purpose of the study, research questions, theoretical framework, nature of the study, definitions of the constructs of the HBM, assumptions, scope of delimitations, limitations, and significance of the study.

Background

Regarding the prevalence of HTC, Fang et al. (2019) conducted a cross-sectional study in China to investigate the prevalence of taking up any form of HIV testing in a lifetime and the past year. The authors found that 49.2% of the study participants had taken part in HIV testing in their lifetime, while 23.8% had been tested for HIV in the past year. Also, Erena et al. (2019) conducted a cross-sectional study to identify determinants associated with how HTC services are being used among adult women aged 15-49 in Ethiopia and found the overall prevalence of ever tested for HIV to be 53%. From MacQueen (2017) viewpoint, young people are usually less likely to be tested, treated, or continue HIV treatment.

Nweze et al. (2017) reported that when looking at the general population, SSA is the region most affected by HIV, with about 25.6 million people living with the virus. Their study discussed the current trends of HIV/AIDS in SSA, the factors that might have contributed to the high prevalence of the virus in the region, the effect of the HIV/AIDS scourge, the prevention programs, and the way forward. A study to identify factors associated with low utilization of HIV counseling and testing services among young Ethiopian women revealed that HTC plays a critical role in controlling and preventing the spread of the virus to improve the lives of PLHIV. Although Bekele and Fekadu (2020)

reported the risk of acquiring HIV is high, only 27% of young Ethiopian women aged 15 to 24 years old were tested and counseled for HIV (Bekele & Fekadu 2020).

The UNAIDS (2014) reported that 19 million (54%) out of 35 million PLHIV did not know their HIV status, which led to the implementation of a strategy that included defining ten targets. The implemented strategy was to be achieved over the 2016-2021 period, which is in line with the third SDG aiming to eradicate AIDS (UNAIDS, 2014). In 2016, 2,418,986 HIV tests were conducted in Cameroon, but the number of people that were tested was unknown (Meka et al., 2020). Also, PLHIV had ART coverage of 32%, which is far below the 60% objective that was set in the 2014-2017 National Strategic Plan (CAMPHIA, 2020). The UNAIDS in 2019 conducted a study that provided evidence that there has not been an increase in the number of people who know their HIV/AIDS status and those who are on antiretroviral therapy, thereby making it challenging for the country to end the HIV/AIDS epidemic by 2030 (UNAIDS, 2019).

A study by De Wet and Kagee (2018) to understand the factors that influenced seeking an HIV test among South Africans showed that stigma accounted for low uptake of HTC services. A cross-sectional study conducted to evaluate HIV testing practices among women in the rural Dominican Republic identified that low-risk perception attributed to the low uptake of HTC services (Montgomery et al., 2020). An in-depth interview conducted by Okal et al. (2020) to gain insights on motivations and drivers for HIV testing among men in the city of Nairobi found that high-risk perception and severe illness led to low uptake of HTC services.

No scientific studies have been conducted to determine individual predictors of HTC uptake in Cameroon. This study, therefore, provided current literature and information on what influenced the uptake of HTC among the youth and students in a Southwest university in Cameroon. The study was needed as the potential for influenced health-based educational activities on the need to take up HTC services, ensuring that barriers associated with HTC uptake are addressed during intervention planning. The study revealed the major reasons why people do not patronage HTC services and will inform decisions. Also, the study identified motivating factors to HTC services uptake.

Problem Statement

The commitment of the United Nations to ending the AIDS epidemic globally by 2030 places AIDS prevention at the center of the response as the disease continues to disproportionately affect young populations (United Nations General Assembly, 2015). According to the United Nations General Assembly (2015), the leading indicator for measuring the progress toward ending the AIDS epidemic lies in tracking HIV infections in all populations. West and Central Africa, of which Cameroon is inclusive, has the second-largest HIV prevalence relative to other countries, and ending HIV as a public health threat will be a major challenge (Khalifa et al., 2019).

As reported by Lalo et al. (2020), Odimegwu et al. (2020), and Woldeyohannes et al. (2017), studies conducted in some countries in Africa showed young people having low HTC uptake even with increasing sexual experience levels. Most youths did not express willingness or interest in HIV testing due to personal and psychological factors such as stigma and discrimination, confidentiality issues, fear of positive results, and the

distance to the facilities where testing is conducted (Desta et al., 2017). University students are usually young and sexually active and at risk of acquiring and transmitting HIV (Woldeyohannes et al., 2017). There has been slight progress toward the interest in HIV testing, as Meka et al. (2020) reported that 53% of their respondents repeated their HIV test at least once. However, there are still factors adversely impacting HIV testing uptake and service delivery, as adolescents 15 years of age and above had lower odds of getting tested for HIV (Meka et al., 2020). Cameroon achieved *56%-**93%-***80%; therefore, Cameroon did not meet the target in 2018 PEPFAR (PEPFAR, 2019).

According to UNAIDS (2015), the UN's 90-90-90 goals were:

- Goal 1: By 2020, *90% of all PLHIV will know their HIV status.
- Goal 2: By 2020, **90% of all people with diagnosed HIV infection will receive sustained antiretroviral therapy.
- Goal 3: By 2020, ***90% of all people receiving antiretroviral therapy will have viral suppression.

Also, the UN's 95-95-95 goals as reported by UNAIDS (2015) were:

- Goal 1: By 2030, *95% of all PLHIV will know their HIV status.
- Goal 2: By 2030, **95% of all people with diagnosed HIV infection will receive sustained antiretroviral therapy.
- Goal 3: By 2030, ***95% of all people receiving antiretroviral therapy will have viral suppression.

The UNAIDS (2015) reported that achieving the fast-track indicators (90-90-90 goals) by 2020 would have put the world on the right path to achieving the 95-95-95 goals and end the AIDS epidemic by 2030. To end the HIV epidemic by 2030 and achieve SDG 3, it is essential to have a broader understanding of factors influencing HTC uptake among the youth. Having a broader understanding may provide significant evidence that can aid in designing and scaling up programs and services geared to attain the targets that have been set (De Cock et al., 2019; Gyasi, & Abass, 2018). The 56%

achievement on the first 90 of the 90-90-90 United Nations goals indicates that most of the population in Cameroon are not tested for HIV, which could be attributed to the approachability, acceptability, availability, affordability, and appropriateness of HTC services (PEPFAR, 2019). I sought to determine the prevalence of HTC (of having been tested within the past 12 months and the predictors of being tested within the past 12 months) using a self-administered anonymous questionnaire based on HBM constructs. An existing questionnaire that was developed by Anwuri et al. (2017) was modified and used for data collection in the current study.

Purpose of the Study

The purpose of this cross-sectional correlational quantitative study was to explore the relationship between the constructs of the HBM (perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action and self-efficacy) and uptake of HTC while controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education. Analysis was conducted using descriptive and inferential analysis, specifically chi-square and logistic regression. Both male and female university students were included in the study. The dependent variable was HTC uptake (those who have been tested for HIV within the past 12 months), while the independent variables were the HBM constructs of perceived susceptibility, perceived severity, perceived benefits, cues to action, perceived barriers to HTC uptake, and self-efficacy. Also, participants who had not used HTC services were asked their reason for not using them and why they felt not using HTC services was important to them.

Further, the control variables consisted of age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education. All students who gave consent to participate in the study were included regardless of whether they had ever tested for HIV. This was important to ascertain the factors that motivated some to go for HTC services and deterred others. This was also required to estimate the prevalence of HTC use and HIV infection. Recommendations were made based on the findings of the study, which aimed to address underlying factors that led to reluctance in the uptake of HTC services.

Research Questions and Hypotheses

RQ1: Are there differences in the prevalence of HTC (having been tested within the past 12 months) in the college levels among university students in the Southwest Region of Cameroon?

$H_0$1: There are no differences in the prevalence of HTC (having been tested within the past 12 months) in the college levels among university students in the Southwest Region of Cameroon.

H_A1: There are differences in the prevalence of HTC (having been tested within the past 12 months) in the college levels among university students in the Southwest Region of Cameroon.

RQ2: What is the association between perceived susceptibility and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education among university students in the Southwest Region of Cameroon?

$H_0$2: There is no association between perceived susceptibility and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education among university students in the Southwest Region of Cameroon.

H_A2: There is an association between perceived susceptibility and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education among university students in the Southwest Region of Cameroon.

RQ3: What is the association between perceived severity and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education among university students in the Southwest Region of Cameroon?

$H_0$3: There is no association between perceived severity and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education among university students in the Southwest Region of Cameroon.

H_A3: There is an association between perceived severity and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education among university students in the Southwest Region of Cameroon.

RQ4: What is the association between perceived benefits and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship

status, area of residence, religious affiliation, and level of education among university students in the Southwest Region of Cameroon?

$H_0$4: There is no association between perceived benefits and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education among university students in the Southwest Region of Cameroon.

H_A4: There is an association between perceived benefits and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education among university students in the Southwest Region of Cameroon.

RQ5: What is the association between perceived barriers and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education among university students in the Southwest Region of Cameroon?

$H_0$5: There is no association between perceived barriers and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education among university students in the Southwest Region of Cameroon.

H_A5: There is an association between perceived barriers and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education among university students in the Southwest Region of Cameroon.

RQ 6: What is the association between cues to action and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education among university students in the Southwest Region of Cameroon?

$H_0$6: There is no association between cues to action and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education university students in the Southwest Region of Cameroon.

H_A6: There is an association between cues to action and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education among university students in the Southwest Region of Cameroon.

RQ7: What is the association between self-efficacy and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education among university students in the Southwest Region of Cameroon?

$H_0$7: There is no association between self-efficacy and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education among university students in the Southwest Region of Cameroon.

H_A7: There is an association between self-efficacy and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship

status, area of residence, religious affiliation, and level of education among university students in the Southwest Region of Cameroon.

RQ8: What is the association between perceived susceptibility, perceived severity, perceived benefits, cues to action, perceived barriers, self-efficacy, and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education among university students in the Southwest Region of Cameroon?

$H_0$8: There is no association between perceived susceptibility, perceived severity, perceived benefits, cues to action, perceived barriers, self-efficacy, and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education among university students in the Southwest Region of Cameroon.

H_A8: There is an association between perceived susceptibility, perceived severity, perceived benefits, cues to action, perceived barriers, self-efficacy, and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation and level of education among university students in the Southwest Region of Cameroon.

Theoretical Model for the Study

The HBM has six constructs that can aid in explaining (or predicting) health-related behaviors (Rosenstock, 1974; Rosenstock et al., 1988). The HBM constructs are

perceived susceptibility, perceived severity, perceived benefits, cues to action, perceived barriers, and self-efficacy. Perceived susceptibility is when individuals see themselves as being at risk or in danger of getting sick, whereas perceived severity is the seriousness of the condition and the consequences that come with it (Tarkang & Zotor, 2015). Also, engaging in a specific action lowers the risk factors associated with the condition (perceived benefits), and perceived barriers are when the individual becomes aware that taking action exceeds the cost of the barriers to-taking action.

The six HBM constructs are grouped into three categories: individual perception, modifying factors, and cues to action (Tarkang & Zotor, 2015). The individual perceptions (susceptibility and severity) affect the perception of illness or disease and the importance of health to the individual (Rosenstock, 1974; Rosenstock et al., 1988; Tarkang et al., 2016). The modifying factors are demographic and structural variables that either motivate or deter people from taking up preventive behaviors (Rosenstock, 1974; Rosenstock et al., 1988; Tarkang et al., 2016). The cues to action are factors that will increase the possibility of practicing a health-promoting behavior and reflects the likelihood of taking the recommended action (Rosenstock, 1974; Rosenstock et al., 1988; Tarkang et al., 2016).

In applying the HBM to HIV testing, it pertains to the likelihood of a person engaging in HTC, which is influenced by their perceived susceptibility to the health outcome (the subjective perception of the risk of contracting HIV) and the perceived seriousness of the health outcome (the feelings individuals have about the clinical, medical, and social consequences of living with HIV/AIDS; Anwuri et al. 2017; Tarkang

et al., 2016). Also, the perceived benefits of preventive actions (being tested for HIV), the perceived barriers or costs of taking a certain health action (tangible and psychological costs associated with getting HTC), cues to action, or cues that prompt one to take a certain action (information and media campaigns encouraging HTC); and self-efficacy or perceived competence in taking a particular health action to mitigate the health condition (Anwuri et al. 2017; Tarkang et al., 2016). Based on the HBM, the perceived benefits an individual has for undertaking HTC minus the perceived barriers to HTC uptake will enable a prediction of the likelihood the individual will take the desired public health actions to practice HTC.

Nature of the Study

In addressing the research questions in this quantitative study, the specific research design was cross-sectional, and primary data collection methods were used. As reported by Setia (2016), cross-sectional studies, through non-experimental, look at data from a population at one point in time. Furthermore, cross-sectional studies are appropriate, as they can provide information on the prevalence of exposures or outcomes and can be used to plan, monitor, and evaluate public health programs (Setia, 2016). The study design was used because it allowed the factors that contribute to the uptake of HTC among students at a Southwest University in Cameroon to be identified.

Quantitative methods are more objective and are consistent in understanding the research questions. To summarize the data, descriptive statistics and chi-square analysis were conducted to explore if an association existed between the variables. Additionally, logistic regression analysis was conducted to examine HTC Uptake Predictors Among

University Students in Southwest Cameroon. The analysis of data used in this research approach in the study was descriptive, which included the description of responses of respondents on HTC and used the constructs of the HBM in predicting the likelihood of the respondents to take up HTC.

Definitions

Explanation of the HBM Constructs

Cues to action: Cues to action refer to the evidence or experiences usually referred to as precipitating forces, which can be either personal, interpersonal, or environmental, that motivate a person to initiate an action (Rosenstock, 1974; Rosenstock et al., 1988; Tarkang et al., 2016). In the study, cues to action were defined as events, strategies, or awareness initiatives that increase the motivation of university students or influence university students to undertake HTC. Cues to action could be internal such as bodily state perception or external such as postcards from health workers, interpersonal interactions, and mass media communication (Rosenstock et al., 1988).

Perceived barriers: Perceived barriers are the beliefs an individual has about the tangible and psychological cost of an advised behavior (Rosenstock, 1974; Rosenstock et al., 1988; Tarkang et al., 2016). In this study, it was referred to as a university student's evaluation of the difficulty of an advised action regarding HTC in getting tested for HIV, the knowledge of the student on HIV prevention, and barriers in condom use, including socially, as using condoms seems to be insulting to partners (Lalo et al., 2020). Students can be deterred from taking up HTC services even though they believe that it is effective in reducing the threat of HIV (Agamlor et al., 2019)

Perceived benefit: Perceived benefit is an individual's belief in the efficacy of the advised action to reduce risk or seriousness of impact that could occur as a particular behavior (Rosenstock, 1974; Rosenstock et al., 1988; Tarkang et al., 2016). For the purpose of this study, it was referred to as the evaluation university students had on the effectiveness of a recommended action in reducing the risk of being HIV positive or the impact of the disease, such as in knowing their HIV status through HTC (Woldeyohannes et al., 2017).

Perceived severity: Perceived severity is the belief that an individual has about the seriousness of a condition and its consequences (Rosenstock, 1974; Rosenstock et al., 1988; Tarkang et al., 2016). An individual may not be motivated to take steps such as engaging in actions that prevent HIV until after realizing that there are serious consequences that come with getting the condition. As reported by Ayosanmi et al. (2020), it was related to how the university students evaluated the seriousness of HIV, the consequences associated with the disease, and the severity of the disease in terms of avoiding it.

Perceived susceptibility: Perceived susceptibility is the belief a person has about the chances of contracting a health condition (Rosenstock, 1974; Rosenstock et al., 1988; Tarkang et al., 2016). It also involves the subjective belief of a person about reaching a harmful state as a result of a health behavior (Hong et al., 2021). In the present study, it was defined as the evaluation of university students' chances or likelihood of getting HIV/AIDS. The perception of susceptibility varies among individuals.

Regarding HTC in this study, a group of people completely denied the possibility of getting HIV even though they did not engage in HIV preventive behaviors such as having multiple sexual partners and not using a condom during sex (Woldeyohannes et al., 2017). There are also a group of people who may believe getting HIV is possible, but also believed that they were unlikely to contract the disease (Woldeyohannes et al., 2017). Further, there are groups that are so afraid of getting HIV and believe that they will acquire it (Woldeyohannes et al., 2017). According to the HBM, if a person feels more susceptible, there is a greater chance of taking preventive measures not to acquire the disease. Some people might recognize the disease from a purely medical view and be concerned with the signs and symptoms and the potential of the disease leading to death. Other people might view contracting HIV from contacts in relations to their jobs as Reeves et al. (2017) in a multinational study in 27 European countries found that there have been multiple research studies showing high prevalence of HIV among female sex workers where their main source of income is earned through sexual relations with paying customers.

Perceived self-efficacy: Self-efficacy refers to the confidence level of an individual in their ability to successfully act (Rosenstock, 1974; Rosenstock et al., 1988; Tarkang et al., 2016). The current study referred to the confidence level of university students in their ability to undertake HTC to know their HIV status.

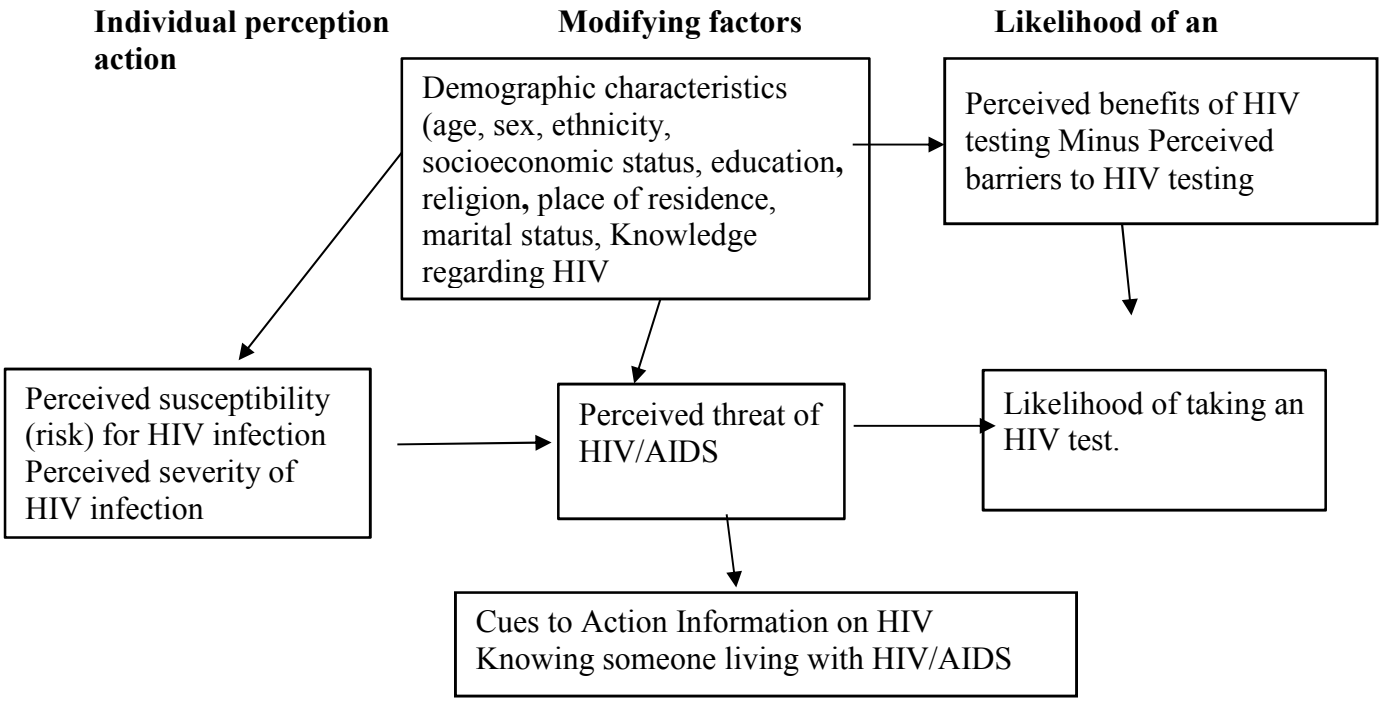
Individual perception: As posited by Tarkang et al. (2016), individual perceptions pertain to the beliefs a person has about how severe a disease is, how vulnerable the individual is in contracting the disease, and how the threat of the disease is regarded. In

the current study, the individual perceptions were concerned with what the university students believed were the risk of contracting HIV and how serious the disease can be if contracted. However, once an individual gains new knowledge, views about the perceived risk of the disease can be reduced.

Modifying factors (demographic characteristics): Modifying factors are variables that can influence the perceptions of an individual while indirectly influencing health-related behaviors (Rosenstock, 1974; Rosenstock et al., 1988; Tarkang et al., 2016). These factors (see Figure 1) can affect a person's perception of susceptibility to contracting HIV, the severity of suffering from HIV/AIDS and its complications, and the perceived benefits the individual expects from knowing their HIV status. Religion was identified by Tarkang et al. (2016) as a strong predictor of HIV risk perception. Also, Tarkang et al. reported that Muslim respondents were found to most likely perceived to be at higher risk than Christians.

Figure 1

Health Belief Model (HBM) Conceptual Framework



Note. Adapted from Social Learning Theory and the Health Belief Model," by I. M. Rosenstock, V. J. Strecher, & M. H. Becker, 1988, *Health Education Quarterly, 15*(2), pp. 175-183 (https://doi.org/10.1177/109019818801500203).

Assumptions

I assumed that the study participants would understand the questionnaire. Furthermore, I assumed that the HBM was the appropriate theoretical framework for predicting engagement in HTC among university students in Southwest Cameroon. It was also assumed that the participants would provide honest answers to the sensitive questions regarding HTC. Another limitation was that participants who met the criteria for the study would be the representative sample of the target population as a non-random

convenience sample was used. Further, findings from the sample population may differ from non-students, limiting the external validity.

Scope and Delimitations

The sample used for the research was limited to individuals living in Cameroon and attending a university in the Southwest region of Cameroon. Also, participants had to be at least 18 years of age, could read English, and were willing to participate in a study about HTC. I assumed that the participants would provide honest and complete responses to the survey questions. In terms of delimitations, the study did not include all of the variables in the analysis, such as religion, marital status, and geographic location, as those were the test variables.

Limitations

Limitations are issues that are beyond the control of the researcher. Greener (2018) recommended that limitations be added as part of a research study. Limitations included sensitivity based on the questions, as students could provide answers they felt were socially desirable instead of choosing responses that reflected their true feelings. Limitations also consisted of the recruitment process for the study subjects while assuring their anonymity and limitations due to identifying all university students a Southwest University in Cameroon.

Also, this study contains limitations of generalizability due to not being able to determine representativeness relative to the study target population and the general population of university students throughout Cameroon. Limitations in research can be part of the design, methodology, or findings. Also, limitations may influence the reported

data and the research findings. Another limitation of the current research was that the data were collected in a particular university in the Southwest region of Cameroon, and the results cannot be generalizable to other regions in the country. Further, correlation studies cannot determine cause and effect, only associations.

Significance of Study

This study is significant for Cameroon to put an end to the HIV epidemic and ultimately attain the SDG3, specifically target 3.3, which calls for an end to the AIDS epidemic by 2030 (UNAIDS, 2015, 2017a; WHO, 2018); HTC are essential for identifying people with HIV, so ART can be initiated and viral loads reduced to eliminate HIV transmission. This study intended to assist in getting a better understanding of the uptake by university-aged persons in Southwest Cameroon of HTC and the prevalence and potential predictors of HTC uptake for use in planning and optimizing the participation of university students in future HTC activities. The study also intended to assist in explaining behaviors such as the predictors of HTC among university students in Southwest Cameroon based on perceived susceptibility, perceived severity, perceived benefits, cues to action, perceived barriers to HTC uptake, and self-efficacy (Anwuri et al., 2017; Rosenstock et al. 1988). Findings from the study will assist in providing baseline information that will be used to help design HTC services among students in a Southwest university in Cameroon to help in striving to achieve the UNAIDS target and the SDGs by 2030. The findings will hopefully provide novel data that will support further research on HTC service uptake and predictors among university students in Cameroon. The study will add to the existing literature on HTC uptake among the youth

in SSA. Recommendations have been provided to relevant public health bodies to improve HTC based on research findings on factors affecting the uptake of HTC services among the study population.

Summary and Transition

In conclusion, the focus of the study was to examine the relationship between perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy to assist in interpreting findings that play a role in the uptake of HTC. This chapter focused on the problem statement, the purpose of the study, the theoretical framework, the nature of the study, assumptions, delimitations, limitations, and significance of the study. Background information was provided to identify factors preventing HTC among students in a Southwest university in Cameroon. The constructs of the HBM were the theoretical framework and independent variables, while HTC was the dependent variables. Chapter 2 includes the literature search strategy, theoretical foundation, epidemiology of HIV/AIDS, HTC, predictors of HTC, review of the proposed methodology, and description of the gap in the literature.

Chapter 2: Literature Review

Introduction

This study aimed to identify predictors of HTC uptake among university students in Southwest Cameroon. A correlational quantitative study was conducted using primary data. The study aimed to use the HBM to help to interpret findings that played a role in the uptake of HTC. There are four sections in this chapter. The first section summarizes the strategy used to conduct the literature review. The second section describes the HBM,

which is the study's foundation, and the rationale for using the HBM. The following section examines previous and current peer-reviewed articles on factors that prevent HTC. The fourth section summarizes of the literature, including identified gaps in the literature, and presents a transition to the next chapter.

Literature Search Strategy

The literature review of this study was carried out based on the study objectives. A thorough literature search was conducted using search engines such as Google and Google Scholar. Journals and databases explored included PubMed, Hindawi, Biomed Central, dissertation and theses relevant to the topic, MEDLINE, ScienceDirect, CINHAL, ProQuest Central, ProQuest Health & Medical Collection, SAGE journals, and APA PsycArticles. Keywords and sentences used during the literature search included HTC, Health Belief Model (HBM), predictors of HTC, modifying factors affecting HTC uptake, perception, youth, and young people.

Furthermore, the reference lists from other peer-reviewed articles were also reviewed for articles related to this study. Although commentaries and case studies were retrieved during the search, they were discarded as not reflecting primary research findings. Narrowing down the years for the literature search was important such as excluding articles published before 2017. There were some exceptions to the year of publication, as foundation literature and historical contexts published prior to 2017 were not discarded.

Theoretical Foundation

The study adopted the HBM as the foundation for the study. The HBM is a widely used conceptual framework in health behavior research to explain change and maintenance of health-related behaviors and as a guiding framework for health behavior intervention (Hong et al., 2021). The HBM is a psychological model that was developed in the 1950s by social psychologists working at the United States public health service who wanted to get a better understanding of the widespread failure of free tuberculosis health screening program (Hochbaum et al., 1952; Rosenstock et al., 1988). The constructs of the HBM are perceived susceptibility, perceived severity, perceived benefits, cues to action, perceived barriers, and self-efficacy.

The HBM has since then been widely used in a variety of situations with attempts to explain and predict health behaviors (Hong et al., 2021; Rosenstock et al., 1988). The HBM has also been used to guide disease prevention and health promotion programs. In the current study on HTC, the individual can engage in HTC services depending on their perception of susceptibility or risk of acquiring the disease, understanding the severity of the disease and what the person perceives as a barrier or benefit in taking the health action. Self-efficacy is having confidence to successfully engage in the health action, which in this case, is engaging in HTC. Figure 1 shows a graphic representation of the HBM.

Literature Review Related to Key Variables and Constructs

Epidemiology of HIV/AIDS

HIV continues to be a global problem, as Jacobi et al. (2020) reported that developing countries continue facing social, economic, developmental, and health problems related to HIV. The Centers for Disease Control and Prevention (CDC) reported that although interventions and preventative measures are in place, HIV/AIDS continues to increase because the intervention and treatments do not reach those who can benefit from them (CDC, 2018). The CDC (2020) reported that in 2018, about 37.9 million people lived with HIV globally, with 61% comprising new infections from SSA.

A study conducted by CAMPHIA from 2017-2018 indicated that out of the 500,000 adults living with HIV, 31,000 were newly infected annually (CAMPHIA, 2020). Though CAMPHIA (2020) reported that the HIV/AIDS rate in Cameroon is 3.7%, Jacob et al. (2020) indicated that Buea, which is a city in Southwest Cameroon, has a population of 86,000 and a prevalence rate of 5.7%. According to the UNAIDS (2015), by 2020, 90% of all PLHIV will know their HIV status, 90% of all people diagnosed with HIV infection will receive sustained antiretroviral therapy, and 90% of all people receiving antiretroviral therapy will have viral suppression. Cameroon did not achieve the 90-90-90 target in 2020 set by UNAIDS (UNAIDS, 2015), as CAMPHIA (2020) indicated in a 2017-2018 report that 55.6% of adults were aware of their HIV status, 51.7% were on treatment for HIV, and 41.4% had viral load suppression. This research identified factors contributing to student reluctance to engage in HTC to aid public health

efforts to increase HTC among young people in Cameroon. This is important if Cameroon is to end the HIV epidemic by 2030 (UNAIDS, 2017b).

The commitment of the United Nations to ending the AIDS epidemic globally by 2030 places AIDS prevention at the center of the response as the disease continues to disproportionately affect young populations (United Nations General Assembly, 2015). West and Central Africa, including Cameroon, has the second-largest HIV prevalence relative to other countries, which makes ending HIV as a public health threat a challenge (Khalifa et al., 2019). Jacobi et al. (2020) conducted and completed a pilot study in Cameroon and reported that developing countries, including Cameroon, continue facing social, economic, developmental, and health problems related to HIV. According to the United Nations General Assembly (2015), the leading indicator for measuring the progress toward ending the AIDS epidemic lies in tracking HIV infections in all populations through HTC.

To end the HIV epidemic by 2030 and achieve SDG 3, it is essential to have a broader understanding of factors influencing HTC uptake among the youth, for it may provide significant evidence that can aid in designing and scaling up program and services geared to attain the targets that have been set (Gyasi, & Abass, 2018). The 56% achievement on the first 90 of the 90-90-90 United Nations goals indicated that most of Cameroon's population had not been tested for HIV, which could be attributed to the approachability, acceptability, availability, affordability, and appropriateness of HTC services (PEPFAR, 2019). I sought to determine the prevalence of HTC (of having been tested within the past 12 months) and the predictors of HTC (of having been tested within

the past 12 months) using a self-administered anonymous survey based upon HBM constructs.

The burden of new HIV infections is likely to increase in Africa and is expected to reach 293 million by 2025 as the increasing number of youths compounds the burden. Reducing the infections in this group is integral to ending the HIV epidemic by 2030 (Wong et al., 2017).

Studies from other African countries showed that though young people had high HTC knowledge, their HTC uptake is still low even though they have increasing levels of sexual experience (Lalo et al., 2020; Odimegwu et al., 2020; Woldeyohannes et al., 2017). Cameroon could not achieve the 90-90-90 target in 2018 set by UNAIDS and only achieved 56%-93%-80% of the UNAIDS 90-90-90 goals* PEPFAR (PEPFAR, 2019). Knowing the predictors that contribute to the uptake of HTC will help increase HTC uptake in Cameroon and hence tracking the cases of HIV (Gyasi, & Abass, 2018; United Nations General Assembly, 2015). The constructs of the HBM assisted in interpreting findings that played a role in assessing factors limiting or preventing HTC use.

HIV Testing and Counseling (HTC)

The study problem being poor uptake of HTC services among young people in Cameroon was approached by determining and relying on the possible predictors of poor uptake of HTC services in the country. Literature on predictors of HTC uptake was reviewed to provide evidence and an empirical layout of the study approach. The study again applied the HBM as a theoretical basis for determining the individual factors that influence the uptake of HTC. Knowing these predictors will aid in developing successful

interventions to improve the uptake of HTC among young people in Cameroon and hence the country achieving the 95-95-95 goals by 2030. The study was based on a quantitative descriptive cross-sectional design, and data were collected from participants using a structured questionnaire adapted from similar studies. A cross-sectional study allows variables (predictors of HTC uptake based on the HBM and prevalence of HTC) to be collected at a point in time (Anwuri et al., 2017).

Prevalence of HTC

The prevalence of HTC is essential as it measures the percentage of the population who should have access to HTC services. In a cross-sectional study conducted by Fang et al. (2019) in China to investigate the prevalence of taking up any form of HIV testing, the results showed that 49.2% and 23.8%, respectively, had taken a form of HIV in a lifetime or the previous year before the study. This shows a low prevalence that Cameroon can relate to, as Ngangue et al. (2017) indicated in a study conducted in Cameroon that confidentiality was a barrier to HTC utilization. Also, Wulandari et al. (2019), Meka et al. (2020), Hlongwa et al. (2020), and Laprise and Bolster-Foucault (2021) reported that fear of breach of confidentiality was a preventing factor in getting tested for HIV. Low prevalence calls for implementing health education programs emphasizing the need to use HTC services to prevent HIV. Also, in a cross-sectional study conducted by Desta et al. (2017) among teachers in Northwest Ethiopia, the authors reported that 53.6% of the respondents had ever tested for HIV.

Another cross-sectional study conducted by Khatoon et al. (2018) in refugee camps in Eastern Nepal showed that HTC services are used by less than a third (29%) of

the population. Additionally, Khatoon et al. (2018) reported that other ways of looking at the gaps need to be viewed so that available resources can be better utilized in increasing the usage of HTC services or in locating interventions. Also, a cross-sectional study conducted among youth aged 15-39 years in Kumasi, Ghana, showed that 38.0% of the study respondents had previously used HIV testing services (Gyasi & Abass, 2018). Agamlor et al. (2019) reported that 30.6% of tertiary students in Hohoe Municipality of Ghana had received HIV testing, while Odimegwu et al. (2019) revealed a low prevalence of HTC in Nigeria.

Furthermore, a cross-sectional study was conducted by Ajayi et al. (2019) among adolescents and adults in two Nigerian universities to determine the effects that HIV risk perception and discussing HIV status with a partner has on the uptake of HIV testing. Ajayi et al. (2019) furthermore researched the impact that knowing the HIV status of a partner will have on the uptake of HIV testing. The results showed that though there were no differences in gender, only 50.6% of the research participants had ever received an HIV test, with 30.7% receiving the test in the past year (Ajayi et al., 2019) and found that there were no differences in gender. These were influenced by the knowledge of the partner's HIV status, HIV discussion with the partners, and concern about getting HIV. The study by Ajayi et al. assisted with the current study in answering the question of having been tested for HIV within the past 12 months. The questions determined the prevalence of both responses: a) prevalence of having ever been tested for HIV and b) prevalence of having been tested for HIV within the past year. They also enabled considerations of the prevalence of HTC and predictors of HTC based on the constructs

of the HBM and based on the modifying factors of the HBM. A similar study in Nigeria among young adults and adolescents showed that less than a quarter (23.7%) of the study population had ever received an HIV test, with only 12.4% who had received the test in the year before the survey (Ajayi et al., 2020). These results fell short of the first 90 of the UNAIDS target for ending the HIV epidemic by 2030. This calls for intensive health education programs to be designed and implemented to enhance the uptake of HTC services.

HTC as an HIV Prevention Strategy

Literature was reviewed on the age, sex, religion, education and knowledge, and marital status of participants in various studies. Ofori (2019) reported that modifying factors such as age, sex, religion, marital status, and education can affect an individual's decision to perform activities to prevent the disease. As reported by Meka et al. (2020), HTC is the gateway to primary prevention, such as in preventing HIV infection, thereby assisting in preventing others from becoming infected, reducing risks of transmitting HIV, and therefore conferring community and public health benefits. Currently, there are low rates of HIV diagnosis and treatment initiation among adolescents and young people between the ages of 15 and 24, posing a significant challenge to the control of HIV (Wong et al., 2017). Though HTC plays a vital role in HIV control (Nnko et al., 2019), access to HTC in SSA continues to be inadequate. With Cameroon being one of the countries in a region with the second largest HIV prevalence (Khalifa et al., 2019), HTC services can play a vital role in the prevention of HIV if people are aware of the services

and are receptive to the resources. Predictors of HTC based on the perception constructs of HBM were also reviewed.

Predictors for HTC

Age

Age is an important modifying factor in the HBM, as it determines the preventive health behaviors individuals take at each stage of life. In six European cities, a multi-level analysis revealed that age is a significant factor in HIV testing behaviors. The model used in the study predicted that HIV test-seeking behaviors increase with age (Mirandola et al., 2017).

Also, in Thai, a study conducted to determine the relationships between HIV/AIDS beliefs and HIV risk behaviors among young people who have sex with men and found an association between people aged 18 to 21 and HIV risk behaviors (Khumsaen & Stephenson, 2017). This result is pertinent as it can help develop tailored messages for this age group to help implement measures to improve HIV prevention behaviors. A study in SSA revealed that the likelihood of HIV testing uptake was reduced significantly in males aged 15 to 24 years than the rest of the population. This suggests the need for the prioritization of HIV programs to this age group to increase their chances of testing for HIV in the future (Makusha et al., 2017).

A cross-sectional study conducted in Tanzania among adults 50+ years to estimate socio-demographic inequalities in HIV testing showed that the HIV testing rate was lower for older people (Mtowa et al., 2017). A study conducted in Nigeria showed that people aged 20–24 years had higher odds of getting an HIV test than those ages 15-

19 (Ajayi et al., 2020). Another study conducted in Burkina Faso by Kirakoya-Samadoulougou et al. (2017) to examine the influence of both individual and community-level determinants of HIV testing uptake showed that there was an association between HIV testing and preventive behavior and age.

Sex

Sex is another significant predictor of healthy and preventive behavior uptake in matters related to HIV. A study was conducted by Nigatu et al. (2021) using the 2016 Ethiopia Demographic and Health Survey to evaluate the rates of uptake and the determining factors in engagement. The authors found that being a male had a negative association with using HIV counseling and testing services. In a cross-sectional study conducted by Perkins et al. (2018) in rural Uganda using population-based data, the authors found that more than half of the men and women in the village wrongfully thought the majority of the village population had never been tested for HIV when most of the population across all the villages had been a test for HIV. Also, Perkins et al. (2018) found that among the male population who viewed that HIV testing was not normative, was associated with never testing for HIV (AOR = 2.6).

A study conducted in Burkina Faso to examine the influence of both individual and community-level determinants of HIV testing uptake discovered that respondents reported that there is an association between sex and HIV testing and preventive behavior. Further analysis showed that one-third of women (36%) stated that they have ever tested for HIV compared to (26%) men (Kirakoya-Samadoulougou et al., 2017). Also, Gyasi and Abass (2018) found in their study, which was carried out in Kumasi,

Ghana, among youth that there was a significant association between HTC utilization and being female. According to Montgomery et al. (2020), 73% of women stated that if an HIV test were offered, they would be very likely to take it while only 68% reported a preceding HIV test, including 47% who were tested over two years earlier.

Furthermore, regional disparities in behavioral changes exist between female and male youths. A study conducted by Odimegwu et al. (2020) in Nigeria using the 2013 Nigeria Demographic and Health Survey data showed a protective factor for female youths using condoms during their last sexual encounter was voluntary HTC. Odimegwu et al. (2020) also found that voluntary HTC significantly reduced the likelihood of primary sexual abstinence for females and males, as well as having a single sexual partner for female youths. In a similar study conducted in Nigeria, the uptake of HIV testing services is high in females at 25.4% compared to males at 20.8% (Ajayi et al., 2020). A study conducted in Ghana by Sambah et al. (2019) to examine the determinants of utilizing HTC among trainee nurses and midwives in public nursing and midwifery training colleges showed that when compared to females, males were less likely to use HTC services.

Religion

Religious beliefs and preventive behaviors for HIV prevention overlap as some religious groups deter their members from undertaking such behaviors. A cross-sectional study conducted by Erena et al. (2019) based on data taken from the Ethiopian Demographic Health Survey of 2016 showed that being Muslims in urban and protestants in rural areas were factors significantly and negatively associated with HTC services

utilization. Religion is also associated with HIV testing behavior. A cross-sectional study conducted by Mtowa et al. (2017) in Tanzania showed a higher prevalence for other Christians than Muslim participants, but a lower prevalence in Catholics compared to Muslims. Another study conducted by Nigatu et al. (2021) showed that following the Muslim religion and other non-orthodox religions or protestant religions had a negative relationship with the uptake of HTC.

HTC, HIV Education, and Knowledge

Education and knowledge regarding HIV/AIDS and HTC are modifiable factors that can determine how individuals perceive their risk or threat to HIV and subsequently the likelihood of the person taking up HTC services and practicing the advised action or behavior. A multi-level analysis conducted in six (6) European cities among men who have sex with men revealed that educational status positively impacted HIV test-seeking behaviors (Mirandola et al., 2017). Another cross-sectional study conducted in China found that HTC knowledge was associated with HIV testing among college students (Fu et al., 2018). Dagne et al. (2017) assessed factors that students from the University of Arba Minch in South Ethiopia associated with when receiving HIV voluntary counseling and testing (VCT) services. They found that students who had a better chance of being tested for HIV were those with knowledge about HIV, students who stated they were willing to have VCT, those who heard about testing being confidential, and those who were sexually active. Also, fear of having a positive test result, fear of being stigmatized, and feeling at risk were obstacles to using VCT. In another study conducted in Ghana by Gyasi and Abass (2018), the authors found that knowledge on HIV transmission and the

availability of HTC services were factors associated with promoting HIV testing. Similar to the University of Arba Minch in the South of Ethiopia study, Onyemachi et al. (2021) conducted a study among undergraduate students in Nigeria on reasons for not engaging in voluntary HIV counseling and testing (VCT). The authors found that though most participants knew about VCT services and considered it necessary to know their HIV status, fear of positive test results, ignorance, stigma, and discrimination were reasons for not getting tested.

Further, a study conducted by Nigatu et al. (2021) using the 2016 Ethiopian Demographic Survey indicated that a higher education level was associated with receiving voluntary HTC services. A similar cross-sectional study carried out in Northwest Ethiopia showed that knowledge about VCT services was positively associated with VCT service utilization. Thus, respondents with good knowledge utilized VCT services more than those with poor knowledge (Desta et al., 2017).

Gyasi and Abass (2018) conducted a study in Ghana about risky sexual behavior and the utilization of HIV counseling and testing among youth in Metropolitan Kumasi, Ghana. The authors found that being aware of available HCT services is associated with the utilization of the services. Another cross-sectional study conducted in Tanzania among adults showed that those who graduated from higher education had higher HIV testing behaviors than those with no formal education (Mtowa et al., 2017). Qiao et al. (2018) conducted a study and found that higher education was associated with the promotion of HIV testing. There is a need to make HIV education inclusive of the

indigenous communities and the informal sector and delivered in the languages that the people best understand.

A cross-sectional study conducted in Addis Ababa using a semi-structured self-administered questionnaire revealed that the overall mean score of HTC knowledge was 66%. Further, students who enrolled in health science departments had almost three times more knowledge (AOR = 2.83) of HIV risk reduction strategies than students in non-health-related departments (Woldeyohannes et al., 2017). The study suggested that HIV prevention and control strategies, including education in the areas of HIV/AIDS, should be part of a university programs curriculum, especially for non-health students, and strengthening health institutions to provide youth-friendly HTC services for HIV with "know your HIV status" campaigns are strongly recommended (Woldeyohannes et al., 2017). Additionally, a cross-sectional study conducted by Lalo et al. (2020) showed that students in the first academic year were less likely to use HTC services. The survey has provided evidence to suggest that creating awareness about HIV prevention among the student community, especially those from non-health sciences, could contribute to increased uptake of voluntary counseling and testing services, condom use, and to reduce the identified stigmatizing barriers (Lalo et al., 2020).

Additionally, a study conducted by Gyasi and Abass (2018) in Kumasi, Ghana, showed that respondents who were knowledgeable or aware of HTC were more likely to uptake HCT. A study conducted in Ghana to investigate the educational achievement of women and HTC during ANC in Ghana showed that women with secondary or higher academic achievement had greater chances of going for HTC and getting the results

(Sambah et al., 2020). Adeleye and Yalma (2020) conducted a study to evaluate the level of understanding among undergraduate students at the University of Abuja in Nigeria about HIV counseling and testing (HCT). The researchers found that though 80.4% of the students were knowledgeable about HCT, the rate of students using HCT services was poor at 43.5%. The study revealed that though students can be aware of HCT services, other interventions may be needed to promote HCT utilization.

Agamlor et al. (2019) wanted to determine the reasons students at a university in Hohoe, Ghana, get tested for HIV. The authors found that uptake of HTC rates among university students was low because of the school the students were attending, the age of the students, and their year of study. The authors also found that the rate at which the students accepted to use of HTC services at school was high because students were willing to use HTC services when other students were around when the services were being offered. This provides insight as to factors affecting HTC and steps taken to increase the uptake of HIV testing.

Marital Status

A study conducted in Nigeria discovered that married (AOR 2.42) respondents had higher odds of testing for HIV than those who were never married (Ajayi et al., 2020). In Malawi, a cross-sectional study conducted to assess the determinants of HIV testing in the male population showed that marital status was a significant predictor of HIV testing behavior, and those who were married were more likely to have been tested for HIV. The study suggests that HIV prevention behaviors should target the young and unmarried population. This is seen to be crucial as it is a step towards the achievement of

the UNAIDS goal of ending the HIV epidemic and also reducing the transmission to others in the population (Mandiwa, & Namondwe, 2019).

A similar cross-sectional study conducted in Ghana using Demographic and Health Survey (DHS) data showed that being married was positively associated with HIV testing Nigatu et al. (2021). However, a study conducted in Kumasi, Ghana, revealed that being single was associated with HIV testing (Gyasi & Abass, 2018). Nigatu et al. (2021) also reported in their study conducted among Ethiopian youths that being married was associated with using voluntary HIV testing and counseling services.

Health Belief Model and HTC

The HBM hypothesizes that an individual's belief about whether or not they are at risk of a negative health outcome and are in danger of severe consequences resulting from the practice of health behavior, and their awareness of the benefits of taking action to elude it can overcome possible barriers, stimulates their willingness to take action (Dickerson, 2019). The HBM was chosen for this current study as it is one of the theories used to change the health behavior of individuals and can be applied to HTC educational services. Also, HBM can assist in determining how the constructs relate to engaging in HTC services (Ofori, 2019). Furthermore, Ofori (2019) provided an excellent and succinct description of how the HBM was used with a 30-question survey to assess health beliefs so they could be correlated with the use of HTC services.

Perceived Susceptibility of HIV Infection

In a study to determine the factors associated with the willingness to utilize HTC services among college students in China, Fu et al. (2018) found that risk perception was

positively associated with HTC uptake. The authors further reported that respondents with a higher perception or high risk of HIV infection were more likely to utilize HTC services (Fu et al., 2018). A study conducted among college students in the United States indicated that non-regular types of partners were related to test intention through perceived susceptibility, while knowledge was found not to be a significant predictor of perceived susceptibility (James et al., 2019).

Furthermore, Thai, Khumsaen, and Stephenson (2017) conducted a study to determine the relationships between HIV/AIDS beliefs and HIV risk behaviors among young who have sex with men and found an association between perceived susceptibility to HIV and HIV risk behaviors. A study conducted in Sudan revealed that perceived susceptibility was weakly associated with using HTC services and hence had low relevance for intervention (Idris et al., 2021). In Ghana, a cross-sectional study conducted among youth aged 15-24 years in Kumasi showed that youth's perceived susceptibility to HIV infection influences their chances of getting tested to know their status (Ofori, 2019).

Perceived Severity of HIV/AIDS

A study conducted in the United States showed that perceived severity of HIV was associated with HIV testing (Anwuri et al., 2017). The authors further revealed that respondents who perceived HIV as associated with high costs to themselves, their relationship, and their families were more likely to undertake HIV testing. The perceived severity of HIV was also found to be associated with HIV risk behaviors, according to a study conducted by Khumsaen and Stephenson (2017) in Thai among men who have sex

with men in Thai. This information could be used to develop tailored messages to help improve HIV-preventive behaviors in young men.

A study conducted in Spain to examine the psychosocial determinants of HIV testing as a function of the decision or change stage concerning this health behavior revealed that perceived severity of HIV was related to the decision not to be tested (Fuster-RuizdeApodaca et al., 2017). The authors added that there are socio-cognitive issues that affect the decision to test or not test for HIV. Fuster-RuizdeApodaca et al. (2017) reported understanding these issues could give room for the design of interventions to influence the psychological determinants that influence HIV testing and improve the uptake of HTC and HIV prevention services.

Perceived Benefits of HIV Testing

Anwuri et al. (2017) studied factors that cause U.S. college students to receive testing and counseling services for HIV. They found that all the constructs of the Health Belief Model (HBM) were strongly associated with students wanting to get tested for HIV -- perceived benefits being the strongest. A study conducted in the United Kingdom using an online survey to assess employers' attitudes about general health checks and HIV testing in the workplace indicated that the perceived benefits to HTC were high (Blake et al., 2018). Anwuri et al. (2017) conducted a cross-sectional study among 186 college students in the United States to ascertain the factors that determined voluntary counseling and screening or testing for HIV showed the strongest association between perceived benefits and HIV testing. Anwuri et al. (2017) also reported that respondents who perceived HIV testing as beneficial were more likely to use HTC and VCT services.

The results imply that understanding that perceived benefits influence the intention to test for HIV is important for designing programs and interventions to propagate the benefits of getting tested for HIV.

A cross-sectional study conducted by Fang et al. (2019) in China investigated the prevalence of taking up any form of HIV testing in a lifetime and the past year. Fang et al. (2019) found that perceived benefits had a significantly positive relationship with the uptake of HIV self-testing among the study population. This emphasizes the need for health education and promotion programs. Perceived benefits of HIV testing have been reported to be associated with the intention to willingly utilize HTC services in a study conducted in Northwest Ethiopia among high school students.

Ofori (2019) conducted a cross-sectional study in Ghana intending to predict HTC behavior of youth of selected rural communities among 424 youth, revealed that perceived benefits were a high predictor of HTC. It was added that an increase in a person's perceived benefits could positively influence one perceived barrier to taking part in HTC. This shows the need to design educational programs to sensitize the youth to the benefits of HTC. A similar study conducted to explore the motivators of couple HTC uptake in Uganda showed that perceived benefits such as prevention of sickness in partner or child and suspicion of infidelity motivate the couple to go for HTC services (Nannozi et al., 2017). This is important as it will eventually reduce HIV naïve cases in infants and children.

Perceived Barriers of HIV Testing

A cross-sectional study conducted by Blake et al. (2018) in the United Kingdom indicated that perceived barriers to HTC among companies were not having enough knowledge about HIV and testing, not having trained staff to undertake HIV testing, and not knowing how to access HIV testing kits. The study further revealed that 57.14% of the companies would consider HIV testing a future provision at their organization. Also, 68.37% would like further guidance on workplace HIV testing (Blake et al., 2018). Blake et al. (2018) conducted a study in the United Kingdom to determine employers' attitudes toward HIV testing in the workplace. The authors found perceived barriers to be limited HIV testing knowledge, lack of trained staff to be in charge of HIV testing, and lack of knowledge in accessing HIV testing kits. Mokgatle and Madiba (2017) conducted research to determine how acceptable HIV self-testing and counseling (HIVST) is among students in two South African provinces. The authors found that less than half of the students did not know about HIVST prior to taking part in the survey, and three-quarters of the students had taken an HIV test in the previous year. Though HIVST is currently not common in Cameroon, research conducted by the Johns Hopkins School of Public Health and Metabiota Cameroon (2018) among men who have sex with men (MSM) and female sex workers (FSW) using HIVST showed that it is possible to expand HIV testing access thereby expanding HIV status knowledge among key population in Cameroon.

A perceived barrier is a key determinant of an individual’s likelihood of taking a recommended action. For instance, a study conducted in China showed that a less discriminatory attitude increases HTC willingness (Fu et al., 2018). Also, a study

conducted in Eastern Nepal found that stigma about HIV, fear, discrimination, and the lack of knowledge about HTC services were some of the barriers that prevented people from using HTC services in refugee camps (Khatoon et al., 2018). Similar to the finding from Eastern Nepal study are studies conducted in Ethiopia, which revealed that being discriminated against by family and people with high levels of stigma towards PLHIV significantly lowered the respondents' willingness to get tested (Desta et al., 2017). Other studies conducted by Desta et al. (2017) in Ethiopia and Rainer et al. (2021) in Zimbabwe found that discrimination contributed to not getting tested for HIV. Abdu et al. (2017) conducted a study a Wolkite University in Ethiopia to determine the factors associated with voluntary counseling and testing (VCT) for HIV. The authors found that stigma and fear of HIV test results were factors affecting VCT testing. Furthermore, other studies conducted by Desta et al. (2017), Nnko et al. (2019), Mika et al. (2020), and Hlongwa et al. (2020) showed that being stigmatized was a factor associated with the prevention of HIV testing.

A review of synthesized articles conducted by Hlongwa et al. (2020) showed key barriers to HIV testing among men in SSA: knowledge of HIV, fear of testing positive for HIV, stigma associated with HIV, healthcare providers' services, confidentiality, and clinic setting. The study suggested that structural and individual factors present barriers to HIV testing uptake among men in SSA. Hence community and home-based initiatives have the potential to improve the uptake of HIV testing among men in SSA, considering the confidentiality concerns posed by clinic settings (Hlongwa et al., 2020). Other barriers that have been reported to prevent the utilization of voluntary HIV counseling

and testing services include fear of being seen at testing sites, fear of positive results, and fear of negative consequences or testing positive for HIV (Cheruiyot et al., 2019; Desta et al., 2017; Hlongwa et al., 2020 & Onyemachi et al., 2021).

There are interrelated barriers at the individual, healthcare system, and interpersonal levels hindering access to testing services. Specifically, barriers to testing included perceived provider attitudes, facility location and setup, wait time/ inconvenient clinic times, low perception of risk, limited HIV knowledge, stigma, discrimination, and fear of having a test. To achieve the desired impact nationally and attain the 90-90-90 targets, multiple interventions addressing barriers to testing are needed to increase testing uptake and link the positive to care (Kujawski et al., 2017).

Barriers to HIV testing, according to Montgomery et al. (2020), from a study conducted among women in the rural Dominican Republic, included low-risk perception, distance or requisite travel, and discomfort being tested. The study further revealed that women report willingness to have an HIV test, and many engage in routine health care, indicating that this population may benefit from incorporating HIV testing and other sexual health promotion activities into routine medical care (Montgomery et al., 2020). In Cameroon, a study conducted by Ngangue et al. (2017) revealed that concerns about confidentiality and privacy were barriers to the uptake of HTC services. This was attributed to inadequate and limited space at the facilities. In their study, Rainer et al. (2021) also found that lack of privacy was a barrier to getting tested for HIV.

Cues to Action for HIV Testing

Ayosanmi et al. (2020) conducted a pilot study on international students at Western Illinois University in the United States to find the relationship between HBM and being tested for HIV and which of the constructs of the HBM play an essential role as to whether or not to get tested. The authors conducted a pilot test with 18 students and validated their instrument. Though the authors completed the study with 185 participants and cautioned about generalizing the research findings as the sample size was limited, they reported confidence in reproducing the research findings in a larger population. Ayosanmi et al. (2020) reported cues to action as one of the factors associated with students wanting to get tested for HIV. Nigatu et al. (2021), in their study among Ethiopian youths from the 2016 Ethiopian Demographic and Health Survey, identified factors such as being educated, being employed, and being rich that reportedly cause individuals to want to get tested for HIV.

Fu et al. (2018) wanted to find the prevalence rate of college students in China willing to use HIV testing and counseling (HTC) services and also the barriers to getting/using HTC services. The authors found that 77.9% of college students reportedly were willing to use HTC services, lower than the 90% recommended 2020 goal by the Joint United Nations Program on HIV/AIDS (UNAIDS) (UNAIDS, 2015, 2017a, b). Also, factors such as stigma and discrimination towards PLHIV and knowing the location of testing sites were associated with the students wanting to use HTC services (Fu et al., 2018).

A cross-sectional study conducted in Thai among men who have sex with men found that cues to action for HIV prevention were associated with HIV risk behaviors (Khumsaen & Stephenson, 2017). Nigatu et al. (2021) conducted a study in Ethiopia and found that having a mobile device and having access to media had a positive relationship with getting voluntary HIV counseling and testing uptake. A study conducted in some SSA countries (Kenya, Nigeria, Zambia) using demographic and health surveys to investigate the relationship between mass media exposure and HIV testing showed a significant relationship, except for Zambia. The findings showed a rise in the number of youths who have been exposed to media messages getting tested for HIV. The researchers suggested that there should be continuous media activities to help diffuse HIV ideas among the youth, as this may eventually lead to HIV testing (Somefun et al., 2019).

A study conducted in Burkina Faso by Kirakoya-Samadoulougou et al. (2017) to examine the influence of individual and community-level determinants of HIV testing uptake discovered that respondents who reported high media exposure were more likely to have tested for HIV. This implies that exposure to media information on HIV influences one to test for HIV and take preventive measures (Kirakoya-Samadoulougou et al., 2017). Also, Montgomery et al. (2020), in their research conducted among women in the rural Dominican Republic, reported that having had a sexually transmitted infection (STI) was associated with the utilization of voluntary HIV testing and counseling services.

Perceived Self-Efficacy

A study conducted in China to investigate the prevalence of behavioral intention to take up HIV testing showed that perceived self-efficacy in taking up HIV testing was significantly associated with behavioral intention to take up any HIV testing (Wang et al., 2018). It is important to design and implement health promotion programs that are targeted toward increasing the self-efficacy of the population, especially those who have never tested for HIV.

According to Khumsaen and Stephenson (2017) in a study conducted among young men who have sex with men in Thai showed that self-efficacy for AIDS preventive behaviors, thus the confidence in refusing sexual intercourse, confidence in questioning potential sex partners about HIV preventive behaviors, and confidence in condom use to prevent HIV was associated with sexual risk behaviors. The researchers suggested that the results have the potential to inform decisions on HIV prevention interventions for young people.

The Review of the Proposed Methodology

This section included reviews of past research that discussed research methods related to the current study. Cross-sectional design was used for this study and most of the research studies used the same approach by examining research and methods related to HIV testing and counseling among college students. Abdu et al. (2017) conducted a study among university students in Ethiopia to examine knowledge, attitude, practice and factors that are related to HIV voluntary counseling and testing. In the study, 336 students self-administered a questionnaire. The authors found that having a good attitude was

significantly associated with a higher rate of having HIV test. The authors suggested that the university should have plans and interventions such as peer education and counseling services in HIV voluntary counseling and testing (VCT) to improve the attitudes and practice of students about VCT for HIV with emphasis on freshmen students.

Lliyasu et al. (2020) conducted a cross-sectional study among university students in Northern Nigeria. The authors looked at HTC uptake and the willingness of students to get self-test for HIV and their predictors. There were 399 university students who completed the self-administered questionnaire. The authors found that though most of the students were willing to self-test for HIV, engaging in HTC was low among the students. Also, the authors found that the willingness of the students to engage in self-testing for HIV was associated with age, ethnicity, the program of study, and the length of time the student had been in the university. The authors recommended the increase of HIV self-testing among students in the northern part of Nigeria to include services such as training peer educators, creating counseling hotlines, having test kits, and establishing strong resource linkages with university students

The Gap in the Literature

The literature review shows that there are no current studies conducted in Cameroon that reveal the prevalence of HTC uptake in a southwest university or that show possible predictors and factors that influence HTC service uptake. Tianyi et al. (2018) conducted a study among healthcare facilities from 10 regions in Cameroon. The study aimed to determine if the healthcare facilities were following the recommended procedures for HIV counseling and testing (HCT) and the impact it may have on how

reliable the test results were. Yumo et al. (2019) also conducted a study among children and adolescents in Cameroon between 6 weeks and 19 years old in three health facilities. The purpose of the study was to compare the effectiveness of concurrently implementing blanket-based provider-initiated testing and counseling (bPITC) and targeted provider-initiated testing and counseling (tPITC) with symptom-based diagnostic HIV testing (DHT), getting tested for HIV, case detection and starting ART. The authors found that there the number of children/adolescents who received an HIV test showed a significant in the mean, while those who tested positive for HIV did not show a significant increase in the mean monthly number. Also, Although multiple studies have been conducted, including a scoping review, there has not been research conducted on uptake predictors of HTC among students in a Southwest University in Cameroon. This study, therefore, seeks to fill this gap by providing current evidence on the prevalence rate of HTC uptake in Southwest Cameroon. The study will therefore add to the literature and thereby filling the knowledge gap on the current prevalence and predictors of HTC uptake in Southwest Cameroon.

Summary

HIV continues to be a health problem in Cameroon and though Cameroon has a prevalence rate of 3.7%, Buea, particularly, has a prevalence rate of 5.7% (CAMPHIA, 2022; Jacobi et al., 2020). The study used the Health Belief Model to help interpret findings that play a role in the uptake of HIV testing and counseling. This current study adopted a descriptive cross-sectional study design where the data was collected from participants using a structured questionnaire at a point in time. Findings based on this

descriptive cross-sectional study will add to the literature and bridge the knowledge gap. The findings from the study will serve as a pathway to ending HIV/AIDS BY 2030. Knowledge gaps in public health will be filled as more interventions are expected to be developed and add to the literature. Chapter 2 provided an overview of the Health Belief Model as the theoretical framework for this study. Also, peer-reviewed literature was used to get a better understanding of the topic, and identify the gap in the literature. Chapter 3 includes the research method, threats to validity, research design and rationale, and the methodology.

Chapter 3: Research Method

Introduction

The purpose of this cross-sectional correlational quantitative study was to explore the relationship between the constructs of the HBM (perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy) and uptake of HIV testing and counseling while controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education. This chapter contains a description of the research design and rationale, the research methodology (including subject recruitment and the informed consent process), data collection instruments, data analysis, results dissemination plan, and ethical issues.

Research Design and Rationale

A cross-sectional quantitative correlation design was used to explore the association between the constructs of the HBM and HTC uptake. This design was appropriate for measuring the prevalence of health outcomes and describing features of a

population. A cross-sectional study design is relatively inexpensive, and the data collection takes a relatively shorter period when compared to alternative designs (Setia, 2016).

The following research questions were addressed in this study:

RQ1: Are there differences in the prevalence of HTC (having been tested within the past 12 months) in the college levels among university students in the Southwest Region of Cameroon?

$H_0$1: There are no differences in the prevalence of HTC (having been tested within the past 12 months) in the college levels among university students in the Southwest Region of Cameroon.

H_A1: There are differences in the prevalence of HTC (having been tested within the past 12 months) in the college levels among university students in the Southwest Region of Cameroon.

RQ2: What is the association between perceived susceptibility and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education among university students in the Southwest Region of Cameroon?

$H_0$2: There is no association between perceived susceptibility and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education among university students in the Southwest Region of Cameroon.

H_A2: There is an association between perceived susceptibility and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education among university students in the Southwest Region of Cameroon.

RQ3: What is the association between perceived severity and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education among university students in the Southwest Region of Cameroon?

H_03: There is no association between perceived severity and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education among university students in the Southwest Region of Cameroon.

H_A3: There is an association between perceived severity and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education among university students in the Southwest Region of Cameroon.

RQ4: What is the association between perceived benefits and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education among university students in the Southwest Region of Cameroon?

H_04: There is no association between perceived benefits and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type,

relationship status, area of residence, religious affiliation, and level of education among university students in the Southwest Region of Cameroon.

H_A4: There is an association between perceived benefits and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education among university students in the Southwest Region of Cameroon.

RQ5: What is the association between perceived barriers and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education among university students in the Southwest Region of Cameroon?

H_05: There is no association between perceived barriers and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education among university students in the Southwest Region of Cameroon.

H_A5: There is an association between perceived barriers and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education among university students in the Southwest Region of Cameroon.

RQ 6: What is the association between cues to action and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education among university students in the Southwest Region of Cameroon?

$H_0$6: There is no association between cues to action and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education university students in the Southwest Region of Cameroon.

H_A6: There is an association between cues to action and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education among university students in the Southwest Region of Cameroon.

RQ7: What is the association between self-efficacy and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education among university students in the Southwest Region of Cameroon?

$H_0$7: There is no association between self-efficacy and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education among university students in the Southwest Region of Cameroon.

H_A7: There is an association between self-efficacy and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education among university students in the Southwest Region of Cameroon.

RQ8: What is the association between perceived susceptibility, perceived severity, perceived benefits, cues to action, perceived barriers, self-efficacy, and HTC

(having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education among university students in the Southwest Region of Cameroon?

$H_0$8: There is no association between perceived susceptibility, perceived severity, perceived benefits, cues to action, perceived barriers, self-efficacy, and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education among university students in the Southwest Region of Cameroon.

H_A8: There is an association between perceived susceptibility, perceived severity, perceived benefits, cues to action, perceived barriers, self-efficacy, and HTC (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation and level of education among university students in the Southwest Region of Cameroon.

The data collection was guided by the research questions. The dependent variable of the study was HIV testing and counseling uptake, while the independent variables were based on the six constructs and the demographic characteristics of the HBM. The survey questions relative to the six constructs (perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy) are independent variables. The control variables of age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education and the test variables

of religion, marital status, and geographic location were used to assess their effect on the dependent variable. This was important to ascertain the factors that motivate university students in Southwest Cameroon and deter others from going for HTC services.

The study design was necessary for answering the research questions for this quantitative correlational study with both descriptive and inferential statistical analyses. A cross-sectional study using logistic regression models enabled the identification of predictors in HTC while also enabling the disproving or validation of predictors previously identified by other researchers. This made the design appropriate for answering the second and third research questions. This research assisted in establishing preliminary evidence needed for planning future advanced studies on HTC uptake among this high interest population in Southwest Cameroon.

A quantitative cross-sectional study design was the best choice to answer the research questions, as it allowed for the collection and analyzation of primary data that pertains to the independent and dependent variables. As posited by Creswell (2009), quantitative research designs are deductive and use surveys or questionnaires in non-experimental approaches to provide numerical data from a subgroup of the research participants. Furthermore, a quantitative study design was chosen due to its potential to provide information on HIV testing and counseling uptake predictors among university students in Southwest Cameroon. A questionnaire (survey) was used in the collection of data from a convenience sample of participants who are students at a Southwest University in Cameroon in their first, second, and third year at the university.

Methodology

Figure 2*: Country Profile And Population. Map of Cameroon and Neighboring Countries Adapted From the Cameroon Demographic and Health Survey Summary Report (2018).*

Study Population

Cameroon is an African Country located in the west and central part of Africa covering a total area of 475.442 square milometers (BUCREP, 2014). On the West of

Cameroon is Nigeria, Central African Republic on the East, Chad in the Northeast, Congo on the South and on the Southwest by the Atlantic Ocean is Gabon and Equatorial Guinea (BUCREP, 2014). English and French are the official languages. Cameroon comprises of 10 regions, 58 divisions, 360 sub-divisions and 360 councils with a total population of 23,344,000. 40% of the population are Christians, 40% associate themselves with indigenous beliefs while 20% are Islam (BUCREP, 2014). There are currently six universities in the Southwest region (English speaking part) of Cameroon where five are private higher institutions of learning and one public university. Some of the privately owned higher institutions have lower student population with some less than 200 due to increase tuition rates. The public university which has a representation of diverse group of students and is more representative of university students in Southwest Cameroon, was the site for the study. The public university was chosen as the study site because access to the public data is more accessible including study participants compared to the private universities. Also, some of the students in the private universities are there for less time before transitioning to another university thereby making the data not to be reliable as the data from the government university. The study population did include university students in Southwest Cameroon which consisted of both male and female students. At the time of the study, the public university had a student population of 12,400.

Sample Size Calculations

The assumptions of calculating the appropriate sample size for the study based on the research design, research questions and the hypotheses. An alpha (α) or probability of

Type I error of 0.05 was chosen as it indicates that there is a 5% chance of a significant difference taking place which occurs as a result of chance. The G*Power Statistical Program was used in determining the appropriate sample size (Faul et al, 2009). The population size of 12,400, the G*Power calculation tool was used to calculate sample size. With an alpha of 0.05, power of 95 using logistic regression and odds ratio (effect size) of 2.33, the minimum required size for this study is 312. Though the minimum required sample size is 312, a sample size of 500 was used to make up for non-response rate. Below figure shows how the sample size calculation was determined.

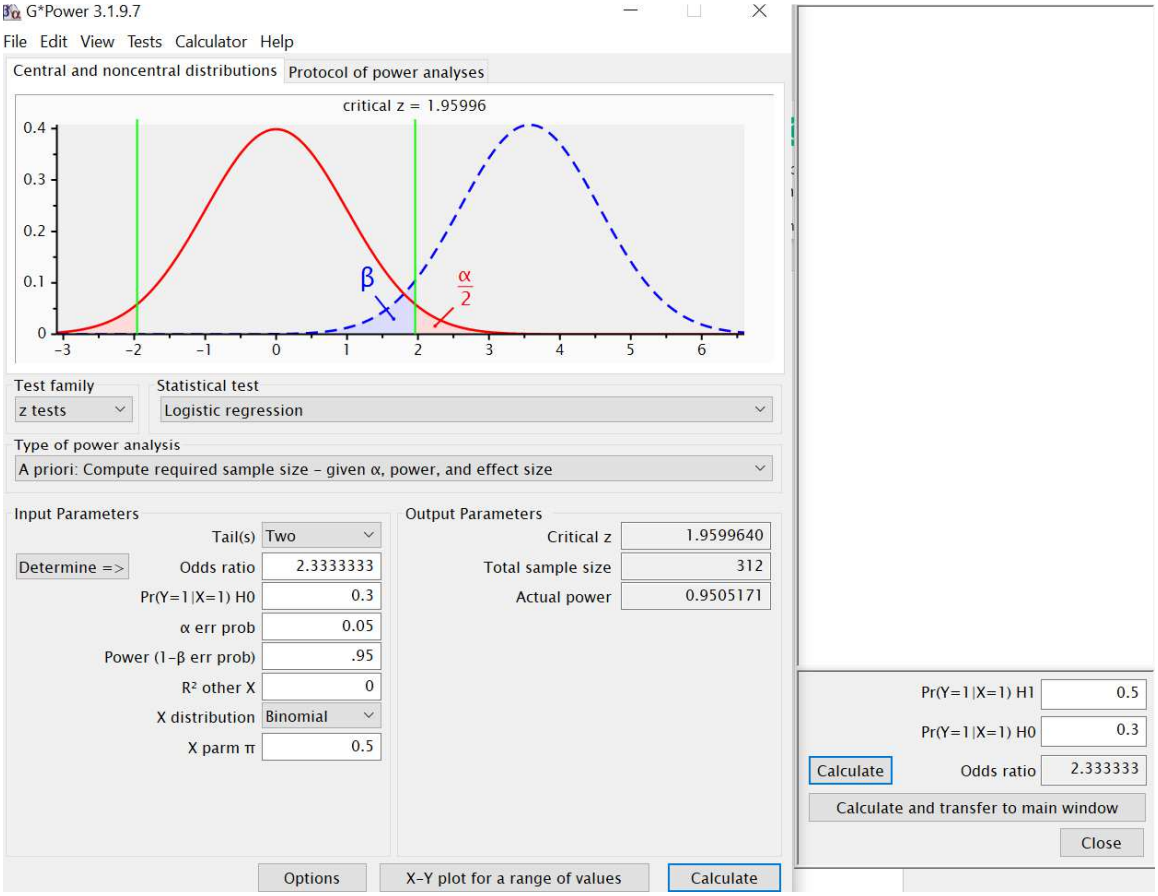


Figure 3: Power Analysis, Sample Size Calculations

Participant Recruitment

Prior to the recruitment process, flyers were developed to introduce the study and an explanation of what the study entailed (Appendix C). The flyers also included the inclusion and exclusion criteria and a link to the study. Flyers were posted on social media platforms and through WhatsApp online platform. The sampling frame consisted of a list of university students in levels 200 (first year), 300 (second year) and 400 (third year) and convenience sampling was used to select the students to be part of the study while ensuring that each participant who attended the university prior to the compilation of the list for the survey was given an equal opportunity of being selected thereby minimizing bias and simplifying the results of the analysis. This sampling method was employed by students going to the Survey Monkey Website and completing the volunteer form if interested in participating. Students who pick a "Yes" were recruited to be part of the study, likewise those who pick a "No" were excluded from the study. This sampling method was preferred as it gave more students opportunities to be part of the study. Being an English teaching university in the Southwest region of Cameroon, personal social media platform including WhatsApp was used to recruit 3-5 students interested in research about the predictors of HIV testing and counseling among university students. The interested participants were then directed to complete the survey on the Survey Monkey website. Also, audio and video surveys are available through Survey Monkey for those who are impaired visually or auditorily. The recruitment email and flyer included a recruitment flyer (Appendix C). Survey Monkey is a safe yet simple online platform which survey novices or survey experts can use. Also, in transmitting study documents

over the internet, Survey Monkey uses Secure Sockets Layer (SSL) which provide a secure connection by encrypting all sensitive information transmitted through the web. Only the students who met the inclusion criteria participated in the study by completing a survey (Appendix D). All data collected was exported to a Statistical Package for the Social Sciences (SPSS) version 28.

Data Collection

A recruitment flyer (Appendix C) seeking volunteers to participate were placed on various social media platforms including WhatsApp. Students interested in participating in the survey clicked on the recruitment flyer (Appendix C) link. The recruitment form informed the students of their right to terminate the survey, that their responses were anonymous, that no identifiable information were collected and also the associated risks and benefits for participation in the study.

Prior to students completing the study questionnaire, they were informed that the information provided was used for the research only and not disclosed to any person. Also, study participants were made aware that recommendations would be made from the results to inform policy decisions regarding HTC uptake and associated factors in the university, Cameroon, and the world at large. The recommendations would be provided through reports and publications in peer-reviewed journals. Furthermore, results and information will be disseminated to the university and also stakeholders for a repeat of the current study to see if there was an impact.

Data from this cross-sectional study was collected through the completion of an online survey (Appendix D) by self-consenting eligible university students who met the

inclusion criteria. The termination link included the Walden University's Research Institutional Review Board (IRB) contact information at 612-312-1210 or email at IRB@mail.waldenu.edu if there were any questions or concerns about the research and that upon request, all data that was been collected would not be included in the study. It was estimated that it would take participants about 20 minutes to complete the questionnaire.

The self- administered questionnaire (Appendix D) was adopted from a similar study conducted on the topic by Vermeer et al. (2009) (Appendix B). The sections of the questionnaire consisted of demographic characteristics/modifying factors (age, sex, settlement type, relationship status, area of residence, religious affiliation and level of education), and factors associated with utilization of HIV testing and counseling services based on the constructs of the Health Belief Model (perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action and perceived self-efficacy).

Data collection protocol

Data was collected using a questionnaire that was administered to prospective study participants. Prior to completing the survey, participants who provided consent completed the questionnaire while those who do not provide consent were not able to participate. The questionnaire consisted of Likert-scaled responses pertaining to uptake predictors of HIV testing and counseling among university students in Southwest Cameroon. The study questionnaire was hosted on Survey Monkey using computer or mobile phone technology and links to the survey were distributed through various social

media sites to make it easier for participants to use their mobile phones to complete the questionnaire. Data was collected until the desired number of participants was reached. Participants who did not qualify for the study were disqualified using Survey Monkey's skip logic design methodology.

The Pilot Study

The adapted questionnaire (survey) for this study was reviewed for content, order and format of the survey questions (consensus validity). Also, with Walden IRB approval, a pilot study was conducted where 7 students were recruited to evaluate the effectiveness of the study recruitment, enrollment and implementation process. Students who participated in the pilot study were from another university and were not drawn from the main study participant pool. Data collected from the pilot study was included in the main study analysis. If there were any changes to the study procedures and/or survey, changes would have been resubmitted for review to the IRB before proceeding to the main study. Therefore, since no changes are made, IRB was notified for permission to proceed with the main study.

Instrumentation and operationalization of constructs

The HBM aspect of the data collection instrument was adapted from Vermeer et al. (2009) who conducted a study about the social and cognitive variables that predict voluntary HIV counseling and testing among Tanzanian medical students in Tanzania. The current study was also conducted in Africa like the Vermeer et al. (2009) but specifically, in Cameroon, West Africa and adapted the instrument by Vermeer et al. (2009) to suit my study. The data collection instrument was appropriate for this current

study as the above study employed the HBM constructs to deduce the various factors that influences VCT. Vermeer et al. (2009) reported that self-efficacy, fear of being HIV-positive and fear of being stigmatized against had an association with the research participants' intention for voluntary counseling and testing (VCT) participation or past VCT-participation. The questions from the above study were adapted by this current study to suit the differences in culture, language, religion, stigma of the respondents of this current study.

The questionnaire was pre-tested and the differences in the study population from the previous study by Vermeer et al. (2009) were taken into consideration and identified and refined/modified before the actual data collection. The Cronbach's Alpha was used to determine the reliability of the data collection instrument. As reported by Emerson (2019), Cronbach's Alpha is used to the internal consistency of a group of questions on a questionnaire, particularly within group questions. With this, the reliability of the items under each construct was tested to ensure that they could be used to measure the construct adequately. Also, the reliability of the whole instrument was tested using the Cronbach's Alpha. The general rule of Cronbach's Alpha as reported by Emerson (2019) is that 0.70, 0.80 and or above is acceptable. Furthermore, Emerson (2019) reported having a high value is not an indication that the items measured the same thing but rather there was a correlation with how the participants answered the questions. Evidence for construct validity was provided through the pilot study and reliability test.

Operationalization

There are specific questions and responses under each variable in the data collection instrument (Appendix D) and (Table # 5 Data Analysis Matrix) these responses measured each variable. After the data collection, composite scores (logistic regression) were therefore generated to answer each of the research questions.

For the constructs of the HBM, composite scores were also be generated for each, a score of the median mark and above was considered high, while below the median mark was considered low. The scale of measurement for each construct and variable in this study was nominal, only the level of study (part of the demographic variables) was ordinal. The questionnaire from this study was adapted from Vermeer et al. (2009) and was used in a previous study that evaluated the attitude toward HIV screening of medical students in Tanzania. Vermeer and colleagues designed the questionnaire based on the constructs of the HBM to predict voluntary HIV counseling and testing among Tanzanian medical students. Permission to use the questionnaire was granted through email correspondence (Appendix A). Vermeer et al. (2009) through their questionnaire, were able to gain information from the Tanzanian medical students on their intention to screen for HIV counseling and testing. The questionnaire for this study consists of 44 items including information on demographics, intention to screen or test for HIV and the constructs of the HBM (Appendix D). For instance, the prevalence of HCT uptake would be calculated using “Have you ever tested for HIV and know your status?”. This has “Yes” and “No” responses, indicating that the percentage of “Yes” that has been reported after the data analysis measured the prevalence of HCT.

Furthermore, some of the questionnaire used for this study were designed using Likert style questions. The purpose of a Likert or Likert-type scale is to understand the opinions or views of participants as it relations to a situation or problem of interest (Joshi et al., 2015). With Likert scales, the types of questions that are used fall into ordinal categories such as "strongly disagree, disagree, agree, strongly agree, prefer to not answer and don't know".

Data Preparation

Missing Data

Prior to analyzing the research data, frequencies were used to screen for missing data. The cases with missing data were removed from the sample and were not used. Additionally, only university students participating in the study who meet the research criteria were included in the analysis. Creswell (2014) reported that handling missing data in the data analysis process allows the researcher to minimize the negative effects of the missing data when the research is being interpreted. In SPSS, missing data was handled using the replace missing data value function. The SPSS program was used to conduct descriptive statistics and to produce frequency tables. Missing or incomplete dataset that was not consistent with the coding (Appendix D) was excluded from the analysis.

Outliers

Outliers are scores in the variables with extreme values that are either lower or higher than the total scores for that variable or a score that more than three standard deviations from the mean. Outliers can lead to Type 1 and Type 2 errors if left unchecked

which leads to unreliable results. During the data preparation process, outliers were removed prior to the data analyzation process.

Coding of Data

The data was coded (Appendix D) ensuring it was ready for analysis. All data was exported to SPSS once the data collection process had ended. The names of the research participants were not written on the questionnaire and all linking personal details of participants were not recoded to ensure anonymity (Appendix D). The data included constructs of the Health Belief Model which was the independent variable (perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action and self-efficacy) and the dependent variable uptake of HIV testing and counseling (yes or no) controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation and level of education. The variable was measured on a quantitative scale and inputted as nominal and categorical. Each variable was defined by name and entered in SPSS version 28 under data view. The variable names included age (24-29, 30 and older with 18-23 years of age as reference category), sex (female with male as reference category); settlement type (Semi-rural, Rural with urban as reference category), current relationship status (Married, Cohabitating, other- single, dating, engage with never married as reference category), area of residence (Northwest, Littoral with Southwest as reference category); Religious affiliation (other - Islam, African traditional with Christianity as reference category) and education level (Second year, Third year with first year as reference category).

Data Analysis

Descriptive Statistical Analysis

The analysis of data employed were descriptive and inferential which included description of responses of respondents on HTC and the use of the constructs of the HBM to predict the likelihood of the respondents to take up HTC for early diagnosis and initiation of ART. All data collected were imported to a Statistical Package for the Social Sciences (SPSS) version 28. Data was analyzed by the principal investigator using SPSS version 28. Frequency distribution tables and percentages were used to determine the proportion in attributes of categorical variables. The study population consisted of students at a university in the Southwest of Cameroon. The students were their first year, second year or third year of study. Their ages ranged from 18 years old to 30 plus. I also looked at the mean and median ages of the study participants. A Chi-square test was used to determine the association between the dependent (HIV testing and counseling) and independent variables (perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action and self-efficacy).

Inferential Statistics

Logistic regression models were used to assess the strength of the association. To test the significance of the results, odds ratio and 95% confidence interval was considered based on a level of significance set at $p<0.05$. Results have been presented in tables and graphs. The results of the bivariate analysis provided information on the relationship between the constructs of the HBM and voluntary HIV testing and counseling among university students in Southwest Cameroon. I conducted a descriptive statistic for

demographics for the study population (Table 1). For the Bivariate analysis, the SPSS command analyze, descriptive statistics and bivariate correlations were used to analyze and examine the relationship between the dependent and the independent variables. I also provided information on the descriptive of HIV/AIDS knowledge among university students in Southwest Cameroon (Table 2) and descriptive of HTC knowledge and usage among university students in Southwest Cameroon (Table 3). Additionally, a descriptive demographic of constructs of the HBM and HTC among university students in Southwest Cameroon were also provided (Table 4). For RQ1, I conducted an ANOVA to investigate the differences in the prevalence of HTC in the college levels (first year, second year and third year) among university students. For RQ2, RQ3, RQ4, RQ5, RQ6 and RQ7, I conducted a logistic regression and tested the associations between each of the six constructs of the health belief model and HIV testing and counseling. A logistic regression analysis was also performed to test the associations between the control variables (age, sex, settlement type, relationship status, area of residence, religious affiliation and level of education) and HIV testing and counseling among university students in Southwest Cameroon (see Table 3). The results indicated the correlation between the variables as to strength of the relationship whether or not it was statistically significant. The multivariate analysis, logistic regression was performed to test the association between perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, self-efficacy and HIV testing and counseling with age, sex, settlement type, relationship status, area of residence, religious affiliation and level

of education as control variables. Odds ratios and 95% confidence intervals were obtained and the level of significance was set at alpha ≤ 0.05.

Data Assumptions

According to Menard (2010) and Osborne (2015), multiple assumptions are to be met for a binomial logistic regression to be performed. Some of those assumptions are that the dependent variable is dichotomous (uptake of HIV testing and counseling yes/no) and that no outliers are to be present. Also, Menard (2010) and Osborne (2015) reported other assumptions include one or more independent variables that are measured on a categorical or continuous scale and there should be 15 cases per independent variable (Menard, 2010; Osborne, 2015).

Threats of Validity

Threats to Internal Validity

In addressing some potential concerns in completing the survey, instructions provided on the consent form for students to answer all the survey questions and to answer them honestly. Although the survey was not scientifically validated, I used consensus validity with experts. Also, another threat to internal validity was how the study was implemented which was through online surveys which is a limitation due to limited response rate and higher chances of bias including selective memory. Although study participants were selected for the study based on certain criteria, study participants may have provided inaccurate answers to the questions which potentially could influence the data provided on the survey. It was assumed that study participants would answer the questions honestly.

Threats to External Validity

Patino and Ferreira (2018) reported lack of external validity is an indication that study results may not be applicable to individuals who are different from the population that is being studied. Generalization can only happen when a probability sampling technique is used to sample the accessible population. Therefore, due to the usage of convenience sampling for the current study, it posed a threat to the external validity of the study and thus limited generalization of the findings to the target population.

Ethical Procedures

Permission was obtained from Walden University before the commencement of the data collection for the pilot as well as the main study. Approval to conduct the study was sorted from the Walden University's Research Institutional Review Board (IRB). Walden University's approval number for this study is 06-10-22-0825387. Upon completion of the online surveys, collected data was stored in electronic format and only the principal investigator had access to the anonymous data. Data for the study was stored on a password protected laptop and the encrypted data will be kept for five years and will be destroyed.

The findings from this study will be de-identified prior to dissemination. Dissemination will be through the completion of a dissertation manuscript, through publications associated with Public Health, HTC predictors among university students. Other possible dissemination avenue is through public health conferences. Furthermore, additional dissemination options will be considered upon study completion.

Summary and Transition

The purpose of this cross-sectional correlational quantitative study was to explore the relationship between the constructs of the HBM (perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action and self-efficacy) and uptake of HIV testing and counseling while controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation and level of education. The cross-sectional design was used for the data collection and participants were recruited using a convenience sampling design. Data was collected from a minimum of 312 university students using Survey Monkey online. Data analysis included descriptive and inferential statistics. Approval to conduct the pilot and the main study were obtained from the Walden University's Research Institutional Review Board (IRB). The results/findings from this study are presented in chapter 4.

Chapter 4: Results

Introduction

The purpose of this cross-sectional correlational quantitative study was to explore the relationship between the constructs of the HBM (perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy) and uptake of HIV testing and counseling while controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education. There were eight research questions and eight hypotheses that were tested. Primary data were collected to examine factors associated with HTC uptake among university students in the Southwest region of Cameroon.

This chapter presents an overview of the findings and results of the research. The chapter describes the data collection process, participant recruitment, response rate, and study results including descriptive and inferential statistics. Furthermore, the research questions based on the analysis were answered, and a summary including the transition to Chapter 5 is also provided.

Pilot Study

I conducted a pilot study that consisted of seven participants on June 11, 2022. The purpose was to evaluate the effectiveness of the study recruitment, enrollment, and implementation process for the study on the relationship between the constructs of the HBM and uptake of HTC. The results of the questionnaire were reviewed and validated ensuring the respondents and I had similar understanding of the content. At the end, no changes were made to the questionnaire, as the participants answered the questions in the allotted time and did not have any write in questions on the questionnaire.

Data Collection

The survey was posted on various social media sites including Facebook and WhatsApp groups from June 2022 to August 2022. An active SurveyMonkey link https://www.surveymonkey.com/r/3GKHLJN was posted on various social media sites including my social media profiles. In addressing the research questions and to test the hypotheses, logistic regression and multivariate regression analyses were conducted. As described in Chapter 3, the minimum sample size for the study was calculated at 312, and a total number of 487 participants completed the questionnaire. The study population consisted of university students in Southwest Cameroon, who were 18 years of age or

older, able to read English, and were in their first year, second year, and third year of study at the university. With a population of 12,400, I used the G*Power Statistical Program to determine the appropriate sample size (Faul et al., 2009). The sampling technique used was convenience sampling. This sampling method is preferred, as it provided more students the opportunity to be part of the study.

Data Analysis

To analyze all of the data that was collected from the study participants, I used SPSS 28. Data was transferred from SurveyMonkey for the 503 participants into an excel spreadsheet for cleaning. After cleaning, data were then transferred to SPSS 28. While analyzing the data, there were 74 participants who did not provide their age, therefore their ages were imputed giving a mean age of 23 years. According to Kleinke et al. (2020), reported data imputation is when estimated values are substituted for data that are inconsistent or missing. After cleaning, the total number of participants was 487. To analyze all of the data that were collected from the study participants, SPSS 28 was used. Data were transferred from excel to SPSS for analyzation.

Results

The descriptive statistics of the study variables are presented in this section. The dependent variable was HTC uptake, and the independent variables were the constructs of the HBM, which are perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy. The HBM was chosen, as it has been used as a guiding framework for health behavior intervention (Hong et al., 2021), health promotion, and disease prevention programs (Hong et al., 2021; Rosenstock et al., 1998).

Furthermore, HBM has also been used in attempts to predict and explain health behaviors (Hong et al., 2021; Rosenstock et al., 1998). The HBM can assist in determining factors that motivate individuals or deter them from utilizing HTC services. For all the constructs of the HBM, the responses 'strongly agree' and 'agree' were combined into 'Agree' while the responses 'strongly disagree' and 'disagree' were combined into 'disagree.' The covariates consisted of age (24-29, 30 and older with 18-23 years of age as reference category), sex (female (1) with male as reference category); settlement type (Semi-rural, Rural with urban as reference category), current relationship status (Married, Cohabitating, other- single, dating, engage with never married as reference category), area of residence (Northwest, Littoral with Southwest as reference category), Religious affiliation (other - Islam, African traditional with Christianity as reference category), and education level (Second year, Third year with first year as reference category).

Descriptive Statistics

Study Population

Descriptive statistics were used to summarize the demographics and the general characteristics of the study participants. Included in the analysis were the frequency distribution and the distribution of the percentages of the study participants. To analyze all of the data that were collected from the study participants, SPSS 28 was used. Descriptive statistic variables consisted of age, sex, settlement type, relationship status, area of residence, religious affiliation, and education level.

Of the 487 participants, 290 (60.0%) were between 18 and 23 years of age, 158 (32.0%) were 24-29 years of age, and 39 (8.0%) were 30 years of age and above. There

were 240 (49.4%) male and 246 (50.6%) female with a total of 486. Settlement type was categorized as living in urban, semi-rural, or rural areas. Of the total of 483 respondents, 384 (79.5%) lived in urban areas, 56 (11.6%) lived in semi-rural areas, and 43 (8.9%) lived in rural areas. There were 349 (73.2%) who were never married, 32 (6.7%) who were married, 46 (9.6%) who were cohabiting, and 50 (10.5%) who fell in the other category for single, dating, or engaged, making it a total of 477 respondents for the question. Area of residence was categorized as Southwest, Northwest, Littoral, or other (Centre, South, North, or West). There was a total of 486 respondents with 359 (73.9%) from Southwest, 51 (10.5%) from Northwest, 53 (10.9%) from Littoral, and 23 (4.7%) categorized as other, which consisted of Centre, South, North or West. Religious affiliation consisted of 484 respondents with Christianity 471 (97.7%) and other 11(2.3%), which consisted of Islam and African traditional. Of the 484 respondents for education level, 103 (21.0%) were first year, 207 (43.0%) were second year, and 174 (36.0%) were third year. Results of the descriptive statistics for demographics are presented in Table 1 below.

Table 1

Selected Study Population Demographics and HIV Testing and Counseling Among University Students in Southwest Cameroon.

Variables	HIV testing and counseling (N-487), (n=*x*)		
	(n)	(N) N=487	%
Age group			
18-23	290		60.0
24-29	158		32.0
30+	39		8.0

Table 1 continued
Selected Study Population Demographics and HIV Testing and Counseling Among University Students in Southwest Cameroon.

Variables	HIV testing and counseling (N-487), (n=*x*)		
	(n)	(N)	%
What is your sex?	n=486		
Male	240		49.4
Female	246		50.6
What is your settlement type?	n=483		
Urban	384		79.5
Semi-rural	56		11.6
Rural	43		8.9
Current relationship status?	n=477		
Never married	349		73.2
Married	32		6.7
Cohabiting	46		9.6
Other (single, dating, engaged)	50		10.5
What area of Cameroon do you live in?	n=486		
Southwest	359		73.9
Northwest	51		10.5
Littoral	53		10.9
Other (Centre, South, North, West)	23		4.7
What is your religious affiliation?	n=484		
Christianity	473		97.7
Other (Islam, African traditional)	11		2.3
What is your current level of education?	n=484		
First year	103		21.0
Second year	207		43.0
Third year	174		36.0

Note. (N = total number completed) (n = total completed in each subgroup area). (N = 487)

HIV/AIDS Knowledge

Out of 487 respondents, 481 (98.2%) indicated having heard about HIV/AIDS while 479 (99.2%) of the 483 respondents reported that a healthy person can have the HIV/AIDS virus. Out of 473 respondents, 436 (92.2%) reported that consistent condom during vaginal and/or anal sex use reduces one's chances of getting HIV while 441 (92.5%) of 477 respondents reported that having a person with one uninfected faithful

sexual partner reduces one's chances of getting the HIV. Out of 473 respondents, 401 (84.8%) reported that HIV virus cannot be transmitted by the bite of mosquito. Also, 380 (85%) of 447 respondents indicated that the HIV virus cannot be transmitted by supernatural means while 423 (89.2%) of 474 respondents indicated that a person cannot become infected by sharing food with a person who has HIV/AIDS. The data indicated that the respondents are knowledgeable about HIV/AIDS. Table 2 contains detailed information on descriptive of HIV/AIDS knowledge.

Table 2
HIV/AIDS Knowledge Among University Students in Southwest Cameroon

Variables	HIV/AIDS knowledge *(N = total number completed) (n = subgroup completed in each area)* N = 487, n= *x*		
	(n)	(N)	%
Have you heard about HIV/AIDS?		N=487	
Yes		481	98.8
No		6	1.2
Can a healthy person have the HIV/AIDS virus?	n=483		
Yes		479	99.2
No		4	0.8
Can consistent condom during vaginal and/or anal sex use reduce one's chances of getting HIV?	n= 473		
Yes		436	92.2
No		37	7.8
Can having a person with one uninfected faithful sexual partner reduces one's chances of getting the HIV?	n=477		
Yes		441	92.5
No		36	7.5
Can the HIV virus be transmitted by the bite of mosquito?	n=473		
Yes		72	15.2
No		401	84.8
Can the HIV virus be transmitted by supernatural means?	n=447		
Yes		67	15.0
No		380	85.0
Can a person become infected by sharing food with a person who has HIV/AIDS?	n=474		
Yes		51	10.8
No		423	89.2

Note. (N = total number completed) (n = total completed in each subgroup area). (N = 487)

HIV Testing and Counseling Knowledge and Usage

Out of the 483 respondents, 316 (65.4%) indicated hearing about HIV voluntary testing and counseling. Of the 312 respondents, 145 (46.5%) indicated hearing about HTC while 145 (46.5%) reported hearing about HTC from health facilities, 117 (37.5%) from mass media and 29 (9.3%) from friends and 6.7% from family. Out of 476 respondents, 247 (51.9%) reported knowing where HTC services were provided. Also, 172 (69.1%) out of 249 respondents indicated HTC services were provided in government clinic/hospital. There were 249 (51.85%) out of 481 respondents who reported being tested for HIV by a health professional. Furthermore, 60 (26.3%) out of 228 respondents reported being tested within 6 months to a year at time of survey completion, and 56 (24.6%) had been tested within 3 to 6 months. There were 190 (86.8%) out of 219 respondents who reported getting tested in order to know their status while 84 (38.2%) out of 220 indicated that not being sexually active was another reason for not being tested. Additionally, 59 (26.8%) of 200 respondents reported that someone seeing them was also a reason for not being tested. Results of the demographic statistics for HTC knowledge and usage are presented in Table 3.

Table 3

HTC Knowledge and Usage Among university students in Southwest Cameroon

Variables	HIV/AIDS knowledge *(N = total number completed) (n = subgroup completed in each area)* N = 487, n= *x*		
	(n)	(N)	%
Have you heard about HIV voluntary testing and counseling?	n=483		
Yes		316	65.4
No		167	34.6
If Yes, where did you hear about HIV testing and counseling?	n=312		
Family		21	6.7
Friends		29	9.3
Health facility		145	46.5
Mass media		117	37.5

Table 3 continued

HTC Knowledge and Usage Among university students in Southwest Cameroon

Variables	HIV/AIDS knowledge *(N = total number completed) (n = subgroup completed in each area)* N = 487, n= *x*		
	(n)	(N)	%
Do you know where HIV testing and counseling services are provided?	n=476		
Yes		247	51.9
No		229	48.1
If yes, where is the HIV testing and counseling service provided?	n=249		
Government clinic/hospital		172	69.1
Private clinics/hospitals		24	9.6
Voluntary testing center		53	21.3
Have you ever been tested for HIV by a health professional?	n=481		
Yes		232	48.2
No		249	51.8
When was the last time you had the test?	n=228		
Less than 3 months		43	18.9
3-6 months		56	24.6
6 months-1 year		60	26.3
1-2 years		32	14.0
More than 2 years ago		37	16.2
Why did you undertake an HIV test?	n=219		
To know my status		190	86.8
Pregnancy or prenatal requirement		13	5.9
Blood donation requirement		16	7.3
Why did you not undertake an HIV test?	n=220		
Do not know where to go for the test		38	17.3
Not sexually active		84	38.2
Cost of test		39	17.7
Someone might see me		59	26.8

Note. (N = 487)

Health Belief Model Constructs

I conducted descriptive statistics of the HBM constructs. Of the 472 respondents who answered the perceived susceptibility questions, 196 (41.5%) indicated being at high risk of contracting HIV. Also, 355 (73.8%) of the 481 respondents indicated that it is possible to contract HIV at some point in time if they do not protect themselves while 261 (54.3%) of the 481 respondents reported worrying a lot about getting HIV. The

above information showed that the respondents agreed that they are susceptible to contracting HIV.

For perceived severity, 340 (70.5%) of the 482 respondents indicated that HIV is a severe health problem while 296 (62.7%) of the 472 respondents reported HIV being a serious condition that they will live with their entire life. Also, 332 (69.3%) of the 479 respondents indicated that HIV would interfere with their social life. The data showed that the respondents were very knowledgeable of the perceived severity of HIV.

For perceived benefits, of the 484 respondents, 383 (79.1%) indicated that it is important to know your HIV status, so that if you are positive, you will not infect others while 318 (70.6%) of the 450 respondents reported that it is easy for people with HIV to get AIDS medication. Of the 467 respondents, 346 (74%) reported being confident that they would receive adequate treatment if diagnosed HIV positive.

For perceived barriers, 309 (65.1%) of the 475 respondents reported being stigmatized or discriminated against if family or friends were to know that they HIV positive, while 315 (66.9%) of 471 respondents indicated that health workers cannot be trusted as they would leak out results of HIV. Also, 244 (54.5%) of the 448 respondents indicated that the HIV testing center was far away from their place of residence. Additionally, 350 (74.8%) of the 468 respondents indicated that they were afraid of HIV positive test results and while 253 (55.8%) of the 453 respondents reported the location of the HIV testing center was not convenient for them.

For cues to action, 262 (57.6%) of the 455 respondents indicated that knowing someone who had tested for HIV motivated them to get an HIV test while 258 (56%) of

the 464 respondents reported that hearing about HIV voluntary testing and counseling from friends and family made them to get an HIV test. Also, of the 469 respondents, 279 (59%) indicated that knowing someone who died of HIV made them get tested to know their status while 329 (70.3%) of the 468 respondents reported that social media was where they often heard about HIV testing in order to know their status.

For self-efficacy, 325 (69.9%) of the 465 respondents indicated being confident of being able to use HIV testing services while 372 (80%) of the 465 respondents reported being able to arrange for an HIV test if they wanted. Furthermore, 218 (47%) of the 467 respondents indicated finding it difficult to attend an appointment if they were interested in getting an HIV test. Of the 468 respondents, 303 (65%) indicated that they were able to openly discuss HIV matters with their family. Detailed information of the descriptive statistics of the HBM constructs are listed in Table 4.

Table 4

Constructs of the Health Belief Model (HBM) and HIV Testing and Counseling (HTC)Among University Students in Southwest Cameroon. (N = 487)

Variables	HBM constructs and HTC *(N = total number completed) (n = subgroup completed in each area)* (N = 487, n= *x*)		
	(n)	(N)	%
Perceived susceptibility			
I am at high risk of contracting HIV	n=472		
Disagree	175		37.1
Neutral	101		21.4
Agree	196		41.5
It is possible that I can contract HIV at some point in time if I do not protect myself	n=481		
Disagree	55		11.4
Neutral	71		14.8
Agree	355		73.8
I worry a lot about getting HIV	n=481		
Disagree	128		26.6
Neutral	92		19.1
Agree	261		54.3

Table 4 continued

Constructs of the Health Belief Model (HBM) and HIV Testing and Counseling (HTC)Among University Students in Southwest Cameroon. (N = 487)

Variables	HBM constructs and HTC *(N = total number completed) (n = subgroup completed in each area)* (N = 487, n= *x*)		
	(n)	(N)	%
Perceived severity			
I believe HIV is a severe health problem	n=482		
Disagree	58		12.0
Neutral	84		17.5
Agree	340		70.5
HIV is a serious condition that I will live with my entire life.	n=472		
Disagree	95		20.1
Neutral	81		17.2
Agree	296		62.7
HIV will interfere with my social life	n=479		
Disagree	84		17.5
Neutral	63		13.2
Agree	332		69.3
Perceived benefit			
It is important to know your HIV status, so that if you are positive, you will not infect others	n=484		
Disagree	35		7.2
Neutral	66		13.7
Agree	383		79.1
It is easy for people with HIV to get AIDS medication	n=450		
Disagree	39		8.7
Neutral	93		20.7
Agree	318		70.6
I am confident I will receive adequate treatment if I am diagnosed positive	n=467		
Disagree	46		10.0
Neutral	75		16.0
Agree	346		74.0
Perceived barriers			
I will be stigmatized or discriminated against if family or friends get to know that am HIV positive	n=475		
Disagree	68		14.3
Neutral	98		20.6
Agree	309		65.1
Health workers cannot be trusted as they can leak out your results	n=471		
Disagree	76		16.1
Neutral	80		17.0
agree	315		66.9

Table 4 continued

Constructs of the Health Belief Model (HBM) and HIV Testing and Counseling (HTC)Among University Students in Southwest Cameroon. (N = 487)

Variables	HBM constructs and HTC *(N = total number completed) (n = subgroup completed in each area)* (N = 487, n= *x*)		
	(n)	(N)	%
The HIV testing center is far away from my place of residence	n=448		
Disagree	101		22.5
Neutral	103		23.0
Agree	244		54.5
I am afraid of HIV positive test results	n=468		
Disagree	50		10.7
Neutral	68		14.5
Agree	350		74.8
The location of the HIV testing center is not convenient for me.	n=453		
Disagree	109		24.1
Neutral	91		20.1
Agree	253		55.8
Cues to action			
Knowing someone who had tested for HIV motivated me to undertake HIV test	n=455		
Disagree	82		18.0
Neutral	111		24.4
Agree	262		57.6
Hearing HIV voluntary testing and counseling from friends and family made me undertake HIV test	n=464		
Disagree	97		21.0
Neutral	109		23.0
Agree	258		56.0
Knowing someone died of HIV made me to undertake a test to know my status	n=469		
Disagree	103		22.0
Neutral	87		19.0
Agree	279		59.0
I often hear about HIV testing to know your status on mass media	n=468		
Disagree	47		10.0
Neutral	92		19.7
Agree	329		70.3
Perceived self-efficacy			
I am confident I can use HIV testing services	n=465		
Disagree	30		6.4
Neutral	110		23.7
Agree	325		69.9

Table 4 continued

Constructs of the Health Belief Model (HBM) and HIV Testing and Counseling (HTC)Among University Students in Southwest Cameroon. (N = 487)

Variables	HBM constructs and HTC *(N = total number completed) (n = subgroup completed in each area)* (N = 487, n= *x*)		
	(n)	(N)	%
I could arrange to have an HIV test if I want to	n=465		
Disagree	15		3.2
Neutral	78		16.8
Agree	372		80.0
If I want an HIV test, I will find it difficult to turn up for the appointment	n=467		
Disagree	150		32.0
Neutral	99		21.0
Agree	218		47.0
I can openly discuss HIV matters with my family.	n=468		
Disagree	76		16.0
Neutral	89		19.0
Agree	303		65.0

I conducted a chi-square and crosstabulation between prevalence of HIV testing and counseling in the college levels among university students in the Southwest region of Cameroon. Of the 102 first year students who completed the survey, 46(45.1%) stated they had been tested for HIV by a health care professional while 56 (54.9%) stated they had not. There were 203 second year students who completed the survey and 74 (36.5%) reported being tested by a health care professional while 129 (63.5%) reported not being tested. Additionally, out of the 173 third year students who completed the survey, 110 (63.6%) reported being tested by a health care professional while 63 (36.4%) reported not being tested. Based on the chi-square test, the p-value was $p.<0.001$ which is less than 0.005 indicating there is a significance between the two values. Based on the data, there are differences in the prevalence of HTC in the college levels among university students

in the Southwest region of Cameroon therefore the null hypothesis is rejected and the alternative hypothesis is accepted. More detailed information on crosstabulation is listed in Table 5 and for chi-square in Table 6.

Table 5

Crosstabulation of Education Level, Being Tested for HIV by a Health Professional.

*What is your current level of education? * Have you ever been tested for HIV by a health professional? Crosstabulation*

			Have you ever been tested for HIV by a health professional?		
			Yes	No	Total
What is your current level of education?	First year	Count	46	56	102
		Expected Count	49.1	52.9	102.0
		% within What is your current level of education?	45.1%	54.9%	100.0%
		% within Have you ever been tested for HIV by a health professional?	20.0%	22.6%	21.3%
		% of Total	9.6%	11.7%	21.3%
	Second year	Count	74	129	203
		Expected Count	97.7	105.3	203.0
		% within What is your current level of education?	36.5%	63.5%	100.0%
		% within Have you ever been tested for HIV by a health professional?	32.2%	52.0%	42.5%
		% of Total	15.5%	27.0%	42.5%
	Third year	Count	110	63	173
		Expected Count	83.2	89.8	173.0
		% within What is your current level of education?	63.6%	36.4%	100.0%
		% within Have you ever been tested for HIV by a health professional?	47.8%	25.4%	36.2%
		% of Total	23.0%	13.2%	36.2%
Total		Count	230	248	478
		Expected Count	230.0	248.0	478.0
		% within What is your current level of education?	48.1%	51.9%	100.0%
		% within Have you ever been tested for HIV by a health professional?	100.0%	100.0%	100.0%
		% of Total	48.1%	51.9%	100.0%

Table 6

Chi-Square Tests of Education Level, Being Tested for HIV by a Health Professional.

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	28.013[a]	2	<.001
Likelihood Ratio	28.324	2	<.001
Linear-by-Linear Association	13.456	1	<.001
N of Valid Cases	478		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 49.08.

Research Questions and Hypotheses

Research Question 1

Are there differences in the prevalence of HIV testing and counseling (having been tested within the past 12 months) in the college levels among university students in the Southwest Region of Cameroon?

Null Hypothesis (H0): There are no differences in the prevalence of HIV testing and counseling (having been tested within the past 12 months) in the college levels among university students in the Southwest Region of Cameroon.

Alternative Hypothesis (HA): There are differences in the prevalence of HIV testing and counseling (having been tested within the past 12 months) in the college levels among university students in the Southwest Region of Cameroon.

A one-way ANOVA (Table 2) was conducted to investigate the differences in the prevalence of HTC in the college levels among university students. The dependent

variable was HTC while the independent variables were the college levels which were nominal and consisted of first year, second year and third year. Results of the ANOVA showed a significant difference in ever being tested for HIV by a health professional between at least two groups F(2, 475)=14.785, p<0.001, (Table 8).The significance level of the ANOVA is p<0.001 which is below 0.05. The mean score for first year college students (M=1.55, SD 0.500) was significantly different than third year students (M=1.36, SD 0.483). However, second year students (M=1.64, SD 0.482), did not differ significantly from first year and third year students (Table 7). There were more second year students who had been tested for HIV by a health professional compared to first year and third year students with a statistically significant level p<0.001. Therefore, the null hypothesis that there are no differences in the prevalence of HIV testing and counseling (having been tested within the past 12 months) in the college levels among university students in the Southwest Region of Cameroon will be rejected (Frankfort-Nachmias and Leon-Guerrero, 2018). More detail information can be found below on ANOVA descriptive (Table 7) and ANOVA (Table 8).

Table 7

ANOVA Descriptive of HIV Testing by a Health Professional.

ANOVA Descriptives

Have you ever been tested for HIV by a health professional?

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
First year	102	1.55	.500	.050	1.45	1.65	1	2
Second year	203	1.64	.482	.034	1.57	1.70	1	2
Third year	173	1.36	.483	.037	1.29	1.44	1	2
Total	478	1.52	.500	.023	1.47	1.56	1	2

Table 8
ANOVA of Been Tested by a Health Professional.

ANOVA
Have you ever been tested for HIV by a health professional?

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	6.993	2	3.497	14.785	<.001
Within Groups	112.337	475	.236		
Total	119.331	477			

Logistic Regression Statistical Assumptions

There are several implied assumptions implied of binary logistic regression. The first assumption requires the independent variable to be binary (dichotomous) which the dependent variable (Have you ever been tested for HIV by a health professional?) has a yes or no. The second assumption is for observations to be independent of each other, which was achieved as this is a cross-sectional study.

Research Question 2

What is the association between perceived susceptibility and HIV testing and counseling (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation and level of education among university students in the Southwest Region of Cameroon?

Null Hypothesis (H0): There is no association between perceived susceptibility and HIV testing and counseling (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious

affiliation and level of education among university students in the Southwest Region of Cameroon.

Alternative Hypothesis (HA): There is an association between perceived susceptibility and HIV testing and counseling (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation and level of education among university students in the Southwest Region of Cameroon.

Logistic regression analysis was performed to examine the association between perceived susceptibility as the independent variable and HIV testing and counseling (HTC) as the dependent variable while controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation and level of education among university students in the Southwest Region of Cameroon. As shown in Table 9, the omnibus tests for the model coefficients were significant at $p<0.001$ with a chi-square value of 76.537 and df (15). The model summary in Table 10 shows a -2 Log likelihood of 540.665, Cox & Snell R^2 of 0.158, and a Nagelkerke R^2 of 0.210. Thus, per the Nagelkerke R^2 21% of the variation in the perceived susceptibility is due to the confounding variables, while Cox & Snell R^2 reports an 15.8% variation. The results of the analysis of the variables in the equation Table 11 showed that those who believed to be at risk of HIV (perceived susceptibility), had 1.104 times the odds of utilizing HTC services (OR=1.104, 95% CI [0.986, 1.236], p=0.086. Therefore, the null hypothesis is retained as there is no association between perceived susceptibility and HIV testing and counseling. Additionally, females were statistically significant at p-0.012 and had 0.578

times the odds of using HTC services than males, age group 24-29 was statistically significant at p<0.001 and 30 years of age or older were also statistically significant at p=0.008. Also, being married was statistically significant at p=0.019 and other (single, dating and engaged) was also statistically significant at p=0.047. Furthermore, being a second-year university student was statistically significant at p=0.013. Though the constant of -0.827 is not statistically significant at p=0.180 and S.E. 0.617, 24–29-year-old, 30-year-old and above, females, being married, other (dating, single, engage) and being a second-year student were all statistically significant indicating they had an effect. Also, for the statistically significant variables, the effect of perceived susceptibility is weaker than the age of the respondents, those who were married, those who were categorized as other (single, dating, engaged) and those who were third year university students.

Table 9

Omnibus Tests of Model Coefficients for HTC and Perceived Susceptibility

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	76.537	15	<.001
	Block	76.537	15	<.001
	Model	76.537	15	<.001

Table 10

Model Summary for HTC and Perceived Susceptibility

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	540.665[a]	.158	.210

[a]. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Table 11

Variables in the Equation for HTC and Perceived Susceptibility

Variables in the Equation

								95% C.I.for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1[a]	Perceived susceptibility	.099	.058	2.949	1	.086	1.104	.986	1.236
	Age group of respondents			13.798	2	.001			
	Age group of respondents(1)	.775	.240	10.412	1	.001	2.170	1.356	3.474
	Age group of respondents(2)	1.089	.413	6.951	1	.008	2.970	1.322	6.673
	Sex of respondent(1)	-.548	.218	6.299	1	.012	.578	.377	.887
	What is your settlement type?			1.083	2	.582			
	What is your settlement type?(1)	.343	.334	1.054	1	.305	1.409	.732	2.713
	What is your settlement type?(2)	-.014	.385	.001	1	.971	.986	.464	2.097
	Current relationship status?			9.331	3	.025			
	Current relationship status?(1)	-1.026	.436	5.528	1	.019	.358	.152	.843
	Current relationship status?(2)	.128	.379	.114	1	.736	1.136	.541	2.389
	Current relationship status?(3)	-.736	.371	3.942	1	.047	.479	.232	.991
	What area of Cameroon do you live in?			4.031	3	.258			
	What area of Cameroon do you live in?(1)	.618	.368	2.816	1	.093	1.855	.901	3.816
	What area of Cameroon do you live in?(2)	.257	.348	.547	1	.459	1.293	.654	2.558
	What area of Cameroon do you live in?(3)	.653	.562	1.351	1	.245	1.922	.639	5.782
	What is your religious affiliation?(1)	-.088	.727	.015	1	.904	.916	.220	3.808
	What is your current level of education?			16.389	2	<.001			
	What is your current level of education? (1)	.254	.277	.841	1	.359	1.289	.749	2.218
	What is your current level of education? (2)	-.737	.297	6.180	1	.013	.478	.268	.856
	Constant	-.827	.617	1.796	1	.180	.437		

a. Variable(s) entered on step 1: Perceived susceptibility, Age group of respondents, Sex of respondent, What is your settlement type?, Current relationship status?, What area of Cameroon do you live in?, What is your religious affiliation?, What is your current level of education? .

Research Question 3

What is the association between perceived severity and HIV testing and counseling (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation and level of education among university students in the Southwest Region of Cameroon.

Null Hypothesis (H0): There is no association between perceived severity and HIV testing and counseling (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation and level of education among university students in the Southwest Region of Cameroon.

Alternative Hypothesis (HA): There is an association between perceived severity and HIV testing and counseling (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation and level of education among university students in the Southwest Region of Cameroon.

Logistic regression was performed to observe if there is an association between perceived severity and HIV testing and counseling (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation and level of education. The combined effort as shown by the omnibus tests for the model coefficients, was significant at the p-value of <.001 with a chi-square value of 74.085 and df (12), Table 12**.** The model summary in Table 13 shows a -2 Log likelihood of 540.132, Cox & Snell R^2 of 0.154, and a Nagelkerke R^2 of 0.205. Thus, per

the Nagelkerke R^2, 20.5 percent of the variation in the perceived severity is due to the confounding variables, while Cox & Snell R^2 reports a 15.4% variation.

Furthermore, the variables in the equation table shows the regression coefficients as per table number 14, perceived severity had a standard error S.E of 0.063, Wald statistics of 0.454, df of 1 and a beta constant (B) of 0.042. Also respondents age 24-29 had a p<0.001, 30 years of age and above with p=0.006, females with p=0.021, being married with p=0.011, other (single, dating, engaged) with p=0.028 and being a third year student with p=0.009 were all statistically significant indicating they all had an effect. Furthermore, Table 14 showed that those who believed HIV to be a serious condition (perceived severity), had 1.043 times the odds of using HTC services (OR=1.043, 95% CI [0.922, 1.180], p=0.500 which is not statistically significant. Therefore, the null hypothesis is retained. Although the constant of -0.289 is not statistically significant at p=0.678 and S.E. 0.697, respondents age 24-29, individuals 30 years or older, females, being married, other (single, dating, engaged) and being a third year student were all statistically significant and had an effect. Furthermore, for the statistically significant variables, the effect of perceived severity was weaker than the age group of the respondents, females respondents, those who were married, those who were categorized as other (single, dating, engaged) and those who were third year university students.

Table 12

Omnibus Tests of Model Coefficients for HTC and Perceived Severity.

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	74.085	15	<.001
	Block	74.085	15	<.001
	Model	74.085	15	<.001

Table 13

Model Summary for HTC and Perceived Severity.

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	540.132[a]	.154	.205

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Table 14

Variables in the Equation for HTC and Perceived Severity

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B) Lower	Upper
Step 1[a]	Perceived Severity	.042	.063	.454	1	.500	1.043	.922	1.180
	Age group of respondents			15.273	2	<.001			
	Age group of respondents(1)	.819	.240	11.614	1	<.001	2.268	1.416	3.632
	Age group of respondents(2)	1.139	.414	7.557	1	.006	3.125	1.387	7.041
	Sex of respondent(1)	-.504	.219	5.305	1	.021	.604	.393	.928
	What is your settlement type?			1.272	2	.530			
	What is your settlement type?(1)	.380	.339	1.257	1	.262	1.462	.753	2.839
	What is your settlement type?(2)	.011	.379	.001	1	.976	1.011	.482	2.124
	Current relationship status?			11.071	3	.011			
	Current relationship status?(1)	-1.107	.434	6.516	1	.011	.330	.141	.773
	Current relationship status?(2)	.111	.379	.086	1	.769	1.118	.532	2.348
	Current relationship status?(3)	-.812	.369	4.851	1	.028	.444	.215	.914
	What area of Cameroon do you live in?			4.407	3	.221			
	What area of Cameroon do you live in?(1)	.641	.367	3.046	1	.081	1.899	.924	3.901
	What area of Cameroon do you live in?(2)	.153	.341	.201	1	.654	1.166	.597	2.276
	What area of Cameroon do you live in?(3)	.736	.556	1.752	1	.186	2.088	.702	6.209
	What is your religious affiliation?(1)	-.040	.727	.003	1	.956	.960	.231	3.989

Table 14 continued

Variables in the Equation for HTC and Perceived Severity

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B) Lower	Upper
What is your current level of education?			17.805	2	<.001			
What is your current level of education? (1)	.261	.276	.898	1	.343	1.299	.756	2.230
What is your current level of education? (2)	-.773	.295	6.877	1	.009	.462	.259	.823
Constant	-.289	.697	.172	1	.678	.749		

a. Variable(s) entered on step 1: Perceived Severity, Age group of respondents, Sex of respondent, What is your settlement type?, Current relationship status?, What area of Cameroon do you live in?, What is your religious affiliation?, What is your current level of education? .

Research Question 4

RQ 4 - What is the association between perceived benefits and HIV testing and counseling (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation and level of education among university students in the Southwest Region of Cameroon?

Null Hypothesis (H0): There is no association between perceived benefits and HIV testing and counseling (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation and level of education among university students in the Southwest Region of Cameroon.

Alternative Hypothesis (HA): There is an association between perceived benefits and HIV testing and counseling (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation and level of education among university students in the Southwest Region of Cameroon.

Logistic regression was performed to observe if there is an association between perceived benefits and HIV testing and counseling (having been tested within the past 12

months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation and level of education of respondent. The omnibus tests for the model coefficients were significant at the p-value of <0.001 with a chi-square value of 72.905 and df (15), Table 15. The model summary in Table 16 shows a -2 Log likelihood of 502.167, Cox & Snell R^2 of 0.161, and a Nagelkerke R^2 of 0.215. Thus, per the Nagelkerke R^2, 21.5 percent of the variation in the perceived benefits is due to the confounding variables, while Cox & Snell R^2 reported a 16.1 percent variation.

Furthermore, the variables in the equation table shows the regression coefficients as per table number 17 for perceived benefits standard error for S.E of 0.082, Wald statistics of 0.613, df of 1 and odds ratio Exp(B) of 1.066. Perceived benefits was not statistically significant at p=0.434 and the null hypothesis was retained. Though perceived benefits with p=0.434 and alpha constant with a p=0.546 were not statistically significant, respondents age 24-29 p=0.001, 30 years or older with p=0.008, females with p=0.008, being married with p=0.014, other (single, dating, engaged) with p=0.041 and being a third year student with p=0.012 were all statistically significant. This is an indication that age, sex, relationship status and level of education of the respondents did have an effect. Also, for those variables that were statistically significant, the effect of perceived benefits was weaker than the age group of the respondents, females respondents, those who were married, those who were categorized as other (single, dating, engaged) and those who were third year university students.

Table 15

Omnibus Tests of Model Coefficients for HTC and Perceived Benefits.

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	72.905	15	<.001
	Block	72.905	15	<.001
	Model	72.905	15	<.001

Table 16

Model Summary for HTC and Perceived Benefits.

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	502.167[a]	.161	.215

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Table 17

V*ariables in the Equation for HTC and Perceived Benefits.*

Variables in the Equation

								95% C.I.for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1[a]	Perceived Benefits	.064	.082	.613	1	.434	1.066	.908	1.253
	Age group of respondents			14.022	2	<.001			
	Age group of respondents(1)	.807	.247	10.693	1	.001	2.241	1.382	3.635
	Age group of respondents(2)	1.152	.437	6.943	1	.008	3.166	1.343	7.460
	Sex of respondent(1)	-.606	.227	7.126	1	.008	.546	.350	.851
	What is your settlement type?			1.875	2	.392			
	What is your settlement type?(1)	.445	.344	1.671	1	.196	1.561	.795	3.066
	What is your settlement type?(2)	.261	.416	.395	1	.530	1.298	.575	2.932
	Current relationship status?			9.929	3	.019			
	Current relationship status?(1)	-1.086	.440	6.092	1	.014	.338	.142	.800
	Current relationship status?(2)	.082	.392	.044	1	.833	1.086	.504	2.342
	Current relationship status?(3)	-.787	.386	4.162	1	.041	.455	.214	.970

Table 17 continued

V*ariables in the Equation for HTC and Perceived Benefits.*

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B) Lower	Upper
What area of Cameroon do you live in?			4.291	3	.232			
What area of Cameroon do you live in?(1)	.697	.378	3.400	1	.065	2.008	.957	4.213
What area of Cameroon do you live in?(2)	.200	.358	.312	1	.577	1.222	.605	2.466
What area of Cameroon do you live in?(3)	.641	.588	1.188	1	.276	1.899	.599	6.017
What is your religious affiliation?(1)	-.153	.832	.034	1	.854	.858	.168	4.387
What is your current level of education?			18.733	2	<.001			
What is your current level of education? (1)	.360	.285	1.594	1	.207	1.433	.820	2.505
What is your current level of education? (2)	-.762	.304	6.274	1	.012	.467	.257	.847
Constant	-.553	.916	.365	1	.546	.575		

a. Variable(s) entered on step 1: Perceived Benefits, Age group of respondents, Sex of respondent, What is your settlement type?, Current relationship status?, What area of Cameroon do you live in?, What is your religious affiliation?, What is your current level of education? .

Research Question 5

What is the association between perceived barriers and HIV testing and counseling (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation and level of education among university students in the Southwest Region of Cameroon?

Null Hypothesis (H0): There is no association between perceived barriers and HIV testing and counseling (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation and level of education among university students in the Southwest Region of Cameroon.

Alternative Hypothesis (HA): There is an association between perceived barriers and HIV testing and counseling (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious

affiliation and level of education among university students in the Southwest Region of Cameroon.

Logistic regression analysis was performed to observe if there is an association between perceived barriers and HIV testing and counseling (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation and level of education among university students in the Southwest Region of Cameroon. A 95% confidence and a 0.05 significance level was used. The Omnibus tests of model coefficients was significant at the p-value of <.001 with a chi-square value of 80.008 and df (15), Table 18. The model summary in Table 19 shows a -2 Log likelihood of 492.526, Cox & Snell R^2 of 0.176, and a Nagelkerke R^2 of 0.235. Thus, per the Nagelkerke $R^{2,}$ 23.5 percent of the variation in the perceived benefits is due to the confounding variables, while Cox & Snell R^2 reports a 17.6% variation. The logistic regression model was statistically significant at p=0.011, Table 20. Therefore, the null hypothesis was rejected. Additionally, respondents age 24-29 with p=0.001, 30 years of older with p=0.025, females with p=0.011, being married with p=0.018 were all statistically significant indicating they all had an effect. For the statistically significant variables, the effect of perceived barriers was weaker than the age group of the respondents and with those who were married. Furthermore, though perceived barriers had the same statistical significance and the same effect as the female respondents, it had a stronger effect than the respondents who were age 30 and above and those who were married.

Table 18

Omnibus Tests of Model Coefficients for HTC and Perceived Barriers

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	80.008	15	<.001
	Block	80.008	15	<.001
	Model	80.008	15	<.001

Table 19

Model Summary for HTC and Perceived Barriers

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	492.526[a]	.176	.235

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Table 20

Variables in the Equation for HTC and Perceived Barriers

Variables in the Equation

								95% C.I.for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1[a]	Perceived Barriers	.126	.050	6.466	1	.011	1.134	1.029	1.250
	Age group of respondents			12.573	2	.002			
	Age group of respondents(1)	.819	.251	10.596	1	.001	2.267	1.385	3.711
	Age group of respondents(2)	.957	.427	5.020	1	.025	2.603	1.127	6.010
	Sex of respondent(1)	-.580	.229	6.392	1	.011	.560	.357	.878
	What is your settlement type?			1.282	2	.527			
	What is your settlement type?(1)	.384	.344	1.244	1	.265	1.468	.748	2.884
	What is your settlement type?(2)	-.017	.415	.002	1	.967	.983	.436	2.216
	Current relationship status?			8.599	3	.035			
	Current relationship status?(1)	-1.021	.433	5.560	1	.018	.360	.154	.842
	Current relationship status?(2)	-.105	.424	.061	1	.804	.900	.392	2.066

Table 20 continued

Variables in the Equation for HTC and Perceived Barriers

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B) Lower	Upper
Current relationship status?(3)	-.740	.377	3.847	1	.050	.477	.228	.999
What area of Cameroon do you live in?			2.760	3	.430			
What area of Cameroon do you live in?(1)	.506	.378	1.788	1	.181	1.659	.790	3.482
What area of Cameroon do you live in?(2)	.265	.367	.523	1	.469	1.304	.635	2.677
What area of Cameroon do you live in?(3)	.581	.580	1.004	1	.316	1.788	.574	5.572
What is your religious affiliation?(1)	-.473	.746	.402	1	.526	.623	.144	2.690
What is your current level of education?			12.343	2	.002			
What is your current level of education? (1)	.354	.291	1.473	1	.225	1.424	.805	2.521
What is your current level of education? (2)	-.562	.309	3.303	1	.069	.570	.311	1.045
Constant	-2.046	.899	5.181	1	.023	.129		

a. Variable(s) entered on step 1: Perceived Barriers, Age group of respondents, Sex of respondent, What is your settlement type?, Current relationship status?, What area of Cameroon do you live in?, What is your religious affiliation?, What is your current level of education? .

Research Question 6

What is the association between cues to action and HIV testing and counseling (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation and level of education among university students in the Southwest Region of Cameroon?

Null Hypothesis (H0): There is no association between cues to action and HIV testing and counseling (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation and level of education university students in the Southwest Region of Cameroon.

Alternative Hypothesis (HA): There is an association between cues to action and HIV testing and counseling (having been tested within the past 12 months), controlling

for age, sex, settlement type, relationship status, area of residence, religious affiliation and level of education among university students in the Southwest Region of Cameroon.

Logistic regression was performed to observe if there is an association between cues to action and HIV testing and counseling (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation and level of education. The combined effort as shown by the omnibus tests for the model coefficients, was significant at the p-value of <0.001 with a chi-square value of 74.710 and df (15), Table 21. The model summary in Table 22 shows a -2 Log likelihood of 506.161, Cox & Snell R^2 of 0.163, and a Nagelkerke R^2 of 0.218. Thus, per the Nagelkerke R^2, 21.8% of the variation in cues to action is due to the confounding variables, while Cox & Snell R^2 reports an 16.3% variation. Furthermore, the variables in the equation table shows the regression coefficients as per Table 23 cues to action had a standard error S.E of 0.052, Wald statistics of 4.061, df of 1 and a beta constant (B) of 0.106. Additionally, respondents 24-29 years of age with p=0.003, 30 years or older with p=0.012, female with p=0.041, being married with p=0.011 and being a third-year student with p=0.017 were all statistically significant. Also, Table 23 showed that those who received reminders, cues or saw posters (cues to action), had 1.112 times the odds of using HTC services (OR=1.112, 95% CI [1.003, 1.232], p=0.044 which is statistically significant. Therefore, the null hypothesis is rejected. Though the constant of -1.304 was not statistically significant at p=0.089 and S.E. 0.768, age, sex, relationship status, and level of education of the respondents were statistically significant and did have an effect. In addition, for the variables that were statistically significant, the effect of perceived

cues to action was weaker than the age group of the respondents, female respondents, those who were married, those who were categorized as other (single, dating, engaged) and those who were third year university students.

Table 21
Omnibus Tests of Model Coefficients for HTC and Cues to Action

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	74.710	15	<.001
	Block	74.710	15	<.001
	Model	74.710	15	<.001

Table 22
Model Summary for HTC and Cues to Action

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	506.161[a]	.163	.218

[a]. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Table 23
Variables in the Equation for HTC and Cues to Action

Variables in the Equation

								95% C.I.for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1[a]	Cues to Action	.106	.052	4.061	1	.044	1.112	1.003	1.232
	Age group of respondents			11.701	2	.003			
	Age group of respondents(1)	.718	.245	8.606	1	.003	2.050	1.269	3.312
	Age group of respondents(2)	1.058	.422	6.278	1	.012	2.881	1.259	6.591
	Sex of respondent(1)	-.465	.227	4.194	1	.041	.628	.403	.980
	What is your settlement type?			1.194	2	.551			
	What is your settlement type?(1)	.371	.343	1.167	1	.280	1.449	.739	2.838
	What is your settlement type?(2)	.121	.384	.100	1	.752	1.129	.532	2.395
	Current relationship status?			12.307	3	.006			

Table 23 continued

Variables in the Equation for HTC and Cues to Action

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B) Lower	Upper
Current relationship status?(1)	-1.114	.438	6.473	1	.011	.328	.139	.774
Current relationship status?(2)	.051	.411	.015	1	.901	1.052	.470	2.357
Current relationship status?(3)	-1.022	.403	6.420	1	.011	.360	.163	.793
What area of Cameroon do you live in?			3.192	3	.363			
What area of Cameroon do you live in?(1)	.562	.370	2.313	1	.128	1.754	.850	3.619
What area of Cameroon do you live in?(2)	.210	.369	.324	1	.569	1.233	.599	2.540
What area of Cameroon do you live in?(3)	.609	.583	1.091	1	.296	1.839	.586	5.769
What is your religious affiliation?(1)	-.051	.725	.005	1	.944	.950	.230	3.934
What is your current level of education?			15.685	2	<.001			
What is your current level of education? (1)	.282	.284	.988	1	.320	1.326	.760	2.313
What is your current level of education? (2)	-.732	.306	5.728	1	.017	.481	.264	.876
Constant	-1.304	.768	2.887	1	.089	.271		

a. Variable(s) entered on step 1: Cues to Action, Age group of respondents, Sex of respondent, What is your settlement type?, Current relationship status?, What area of Cameroon do you live in?, What is your religious affiliation?, What is your current level of education? .

Research Question 7

RQ 7- What is the association between self-efficacy and HIV testing and counseling (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation and level of education among university students in the Southwest Region of Cameroon?

Null Hypothesis (H0): There is no association between self-efficacy and HIV testing and counseling (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation and level of education among university students in the Southwest Region of Cameroon.

Alternative Hypothesis (HA): There is an association between self-efficacy and HIV testing and counseling (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation and level of education among university students in the Southwest Region of Cameroon.

Logistic regression analysis was performed to observe if there is an association between self-efficacy and HIV testing and counseling (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation and level of education among university students in the Southwest Region of Cameroon. A 95% confidence and a 0.05 significance level was used. The Omnibus tests of model coefficients was significant at the p-value of <0.001 with a chi-square value of 94.916 and df (15), Table 24. The model summary in Table 25 shows a -2 Log likelihood of 483.646, Cox & Snell R^2 of 0.203, and a Nagelkerke R^2 of 0.271. Thus, per the Nagelkerke $R^{2,}$ 27.1 percent of the variation in self-efficacy is due to the confounding variables, while Cox & Snell R^2 reports a 20.3% variation. The logistic regression model was statistically significant at p<0.001, Table 26. Therefore, the null hypothesis was rejected. Additionally, respondents 24-29 with p=0.008, those 30 years or older with p=0.022, females with p=0.021, being married with p=0.008 and university students with were in their third year with p=0.022 were statistically significant. This is an indication that age, sex, relationship status, and level of education of the respondents did have an effect. Also, for the statistically significant variables, the effect of perceived self-efficacy is stronger than the age group of the respondents, female respondents, those who were married, and those who were third year university students.

Table 24
Omnibus Tests of Model Coefficients of HTC and Self-Efficacy

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	94.916	15	<.001
	Block	94.916	15	<.001
	Model	94.916	15	<.001

Table 25 *Model Summary for HTC and Self-Efficacy*

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	483.646[a]	.203	.271

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Table 26
Variables in the Equation for HTC and Self-Efficacy

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B) Lower	Upper
Step 1[a]	Self-Efficacy	.340	.075	20.374	1	<.001	1.405	1.212	1.628
	Age group of respondents			9.771	2	.008			
	Age group of respondents(1)	.679	.255	7.058	1	.008	1.971	1.195	3.252
	Age group of respondents(2)	1.009	.440	5.269	1	.022	2.743	1.159	6.493
	Sex of respondent(1)	-.548	.237	5.351	1	.021	.578	.364	.920
	What is your settlement type?			2.730	2	.255			
	What is your settlement type?(1)	.553	.360	2.353	1	.125	1.738	.858	3.522
	What is your settlement type?(2)	.341	.403	.718	1	.397	1.407	.639	3.099
	Current relationship status?			10.333	3	.016			
	Current relationship status?(1)	-1.188	.451	6.944	1	.008	.305	.126	.738
	Current relationship status?(2)	.126	.404	.098	1	.754	1.135	.514	2.503
	Current relationship status?(3)	-.736	.390	3.567	1	.059	.479	.223	1.028
	What area of Cameroon do you live in?			2.782	3	.426			

Table 26 continued

Variables in the Equation for HTC and Self-Efficacy

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B) Lower	Upper
What area of Cameroon do you live in?(1)	.468	.394	1.411	1	.235	1.596	.738	3.454
What area of Cameroon do you live in?(2)	.224	.377	.353	1	.552	1.251	.597	2.621
What area of Cameroon do you live in?(3)	.700	.570	1.512	1	.219	2.014	.660	6.151
What is your religious affiliation?(1)	.028	.736	.001	1	.970	1.028	.243	4.354
What is your current level of education?			14.317	2	<.001			
What is your current level of education? (1)	.280	.293	.919	1	.338	1.324	.746	2.349
What is your current level of education? (2)	-.710	.309	5.281	1	.022	.492	.268	.901
Constant	-4.578	1.097	17.420	1	<.001	.010		

a. Variable(s) entered on step 1: Self-Efficacy, Age group of respondents, Sex of respondent, What is your settlement type?, Current relationship status?, What area of Cameroon do you live in?, What is your religious affiliation?, What is your current level of education? .

Research Question 8

RQ 8 - What is the association between perceived susceptibility, perceived severity, perceived benefits, cues to action, perceived barriers, self-efficacy and HIV testing and counseling (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation and level of education among university students in the Southwest Region of Cameroon?

Null Hypothesis (H0): There is no association between perceived susceptibility, perceived severity, perceived benefits, cues to action, perceived barriers, self-efficacy and HIV testing and counseling (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation and level of education among university students in the Southwest Region of Cameroon.

Alternative Hypothesis (HA): There is an association between perceived susceptibility, perceived severity, perceived benefits, cues to action, perceived barriers, self-efficacy and HIV testing and counseling (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation and level of education among university students in the Southwest Region of Cameroon.

Logistic regression analysis was performed to examine the association between the constructs of the Health Belief Model as the independent variable and HIV testing and counseling (HTC) as the dependent variable while controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation and level of education among university students in the Southwest Region of Cameroon.

As shown in Table 27, the omnibus tests for the model coefficients was significant at $p<0.001$ with a chi-square value of 68.175 and df (15). The model summary in Table 28 shows a -2 Log likelihood of 401.729, Cox & Snell R^2 of 0.181, and a Nagelkerke R^2 of 0.242. Thus, per the Nagelkerke R^2 24.2 percent of the variation in the HBM constructs is due to the confounding variables, while Cox & Snell R^2 reports an 18.1% variation. The results of the analysis of the variables in the equation Table 29 showed that the HBM constructs provided 1.053 times the odds of utilizing HTC services (OR=1.053, 95% CI [1.017, 1.092], p=0.004. Therefore, the null hypothesis was rejected as there is an association between the HBM constructs and HIV testing and counseling (having been tested within the past 12 months), controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation and level of education among

university students in the Southwest Region of Cameroon. Additionally, respondents 24-29 years of age with p=0.004, 30 years or older with p=0.011, being married with p=0.018 were all statistically significant. This is an indication that age and relationship status did have an effect. Furthermore, for those variables that were statistically significant, the effect of HBM constructs had a stronger effect than the age of the respondents and those who were married.

Table 27

Omnibus Tests of Model Coefficients for HTC and Constructs of HBM

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	68.175	15	<.001
	Block	68.175	15	<.001
	Model	68.175	15	<.001

Table 28

Model Summary of HTC and Constructs of HBM

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	401.729[a]	.181	.242

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Table 29

Variables in the Equation for HTC and Constructs of HBM

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B) Lower	Upper
Step 1[a]	HBM constructs	.052	.018	8.185	1	.004	1.053	1.017	1.092
	Age group of respondents			10.123	2	.006			
	Age group of respondents(1)	.713	.279	6.511	1	.011	2.039	1.180	3.525
	Age group of respondents(2)	1.192	.470	6.426	1	.011	3.293	1.310	8.277

Table 29 continued
Variables in the Equation for HTC and Constructs of HBM

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B) Lower	Upper
Sex of respondent(1)	-.480	.256	3.531	1	.060	.619	.375	1.021
What is your settlement type?			1.996	2	.369			
What is your settlement type?(1)	.404	.386	1.093	1	.296	1.497	.703	3.191
What is your settlement type?(2)	.513	.471	1.184	1	.277	1.670	.663	4.207
Current relationship status?			7.729	3	.052			
Current relationship status?(1)	-1.089	.459	5.629	1	.018	.337	.137	.828
Current relationship status?(2)	-.024	.462	.003	1	.959	.977	.395	2.415
Current relationship status?(3)	-.702	.429	2.676	1	.102	.496	.214	1.149
What area of Cameroon do you live in?			.856	3	.836			
What area of Cameroon do you live in?(1)	.294	.398	.543	1	.461	1.341	.614	2.929
What area of Cameroon do you live in?(2)	.212	.404	.274	1	.601	1.236	.559	2.730
What area of Cameroon do you live in?(3)	.336	.688	.238	1	.625	1.399	.364	5.382
What is your religious affiliation?(1)	-.100	.827	.015	1	.904	.905	.179	4.579
What is your current level of education?			14.554	2	<.001			
What is your current level of education? (1)	.520	.316	2.708	1	.100	1.682	.905	3.124
What is your current level of education? (2)	-.613	.342	3.209	1	.073	.542	.277	1.059
Constant	-3.949	1.418	7.757	1	.005	.019		

a. Variable(s) entered on step 1: HBM constructs, Age group of respondents, Sex of respondent, What is your settlement type?, Current relationship status?, What area of Cameroon do you live in?, What is your religious affiliation?, What is your current level of education? .

Summary

I conducted this quantitative study to explore the relationship between the constructs of the health belief model (perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action and self-efficacy) and uptake of HIV testing and counseling while controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation and level of education. A structured online questionnaire was used to collect data from university students. The data was then cleaned, evaluated and analyzed so the research questions and hypotheses could be tested.

The results of the study indicated that the relationships between the constructs of the HBM, except for perceived severity and perceived benefits, were statistically significant and were associated with participation in HTC services. Perceived barriers had a significance of $p=0.011$, cues to action $p=0.044$ and self-efficacy $p<0.001$. Though they were statistically significant, self-efficacy had the strongest association. Furthermore, perceived susceptibility ($p=0.086$), perceived severity ($p=0.500$) and perceived benefits ($p=0.434$) were not statistically significant, and the associations were weak. Chapter 5 consists of the interpretation of the study findings, limitations, implications for social change and provided recommendations for future research.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this cross-sectional correlational quantitative study was to explore the relationship between the constructs of the HBM and uptake of HTC while controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation, and level of education. The HBM constructs consist of perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy. The HBM is one of the theories used in public health to guide health promotion and disease prevention programs (Hong et al., 2021; Rosenstock et al., 1988). Additionally, the HBM has also been used in attempts to explain and predict health behaviors (Hong et al., 2021; Rosenstock et al., 1988). Concerning the HBM, HTC uptake was higher among second year students at 42.47% compared to first year and third year students. Also, HTC uptake was 48.2% where perceived susceptibility, perceived barriers, cues to action, and self-efficacy were statistically significant and were predictors of HTC uptake. Furthermore,

perceived severity and perceived benefits were not statistically significant therefore were barriers to HTC uptake. In this chapter, I provide an interpretation of findings, discuss limitations, recommendations, and implications for social change, and present a conclusion.

Interpretation of the Findings

To test the research questions and the hypotheses, I conducted descriptive statistics, Chi-Square, ANOVA, logistic regression, and multiple logistic regression analyses. For Research Question 1, the prevalence rate of HTC was higher among second year students at 202 (42.47%) compared to third year students at 173 (36.19%) and first year students at 102 (21.34%) (Table 7). This is an indication that students at the university who were in their second year had utilized HTC services more than those in their first year or third year. These findings are similar to Dagne et al. (2017), who conducted a study among university students and the results showed that students in their second year 127 (65.1%) utilized HIV voluntary counseling and testing services compared to 108 (60%) first year and 113 (59.2%) third year students. However, a study conducted by Tshivhase et al. (2022) among university students and HIV testing services (HTS) utilization revealed that students in their third and fourth year utilized HTS more than students in their first and second year. The authors concluded that the rate at which university students use HTS tend to increase with their education level.

For Research Question 2, findings of the logistic regression and perceived susceptibility to HTC indicated that individuals who believed to be at risk of HIV had 1.104 times the odds of using HTC services. There was no association between perceived

susceptibility and HTC, p=0.086. Therefore, the null hypothesis was retained. Also, though 73.8% of 481 respondents indicated it was possible to contract HIV without protection, 54.3% of 481 worried about getting HIV compared to 41.5% of 196 who reported being at risk (Table 4). In a study conducted by Woldeyohannes et al. (2017), the authors found that out of 560 students, 199 (35.5%) of the study respondents believed to be at risk of contracting HIV and out of 589 respondents, 457 (77.6%) were willing to get tested if asked. Furthermore, Woldeyohannes et al. reported that out of 581 respondents, 479 (82.4%) agreed that getting an HIV test would provide safety for others. Additionally, Licata et al. (2022) conducted a study and found that engaging in high-risk sexual behaviors were strongly associated with HIV testing. Therefore, it is imperative that education about HTC services be provided to university students on a continuous basis as a reminder of the availability of the resources for increased utilization.

For Research Questions 3 and 4, perceived severity (p=0.500) and perceived benefits (p=0.434) were not statistically significant therefore the null hypothesis was retained. For perceived severity, the results showed that respondents who believed HIV to be a serious condition had 1.043 times the odds of using HTC services. The findings are not consistent with a study conducted by Anwuri et al. (2017) among college students in the United States. Anwuri et al. reported that the study participants who viewed HIV as having a significant impact on themselves, their families, or their relationships were more likely to get tested for HIV (Anwuri et al., 2017). Furthermore, the findings were also not consistent with a study by Ayosanmi et al. (2020) where the authors found that college students who believed HIV was a serious condition, were not accepting of getting tested

for HIV due to fear of being stigmatized against. It is therefore imperative that the severity of HIV to individuals, family members and society as a whole be made a focal point in health promotion interventions so that university students would be urged to utilize HTC services.

With regards to perceived benefits, the results indicated that respondents who saw the benefits of getting tested had 1.029 times the odds of using HTC. The findings are also not consistent with Anwuri et al. (2017), who reported a strong association between perceived benefits and getting tested for HIV. This is consistent with a study by Nannozi (2017) where the author found that a benefit of getting tested was that it can lead to receiving HIV care and treatment in the early stages which can then prevent infecting those who are negative.

The findings of the logistic regression analysis for perceived barriers showed a significant association between perceived barriers and HTC, $p<0.011$. The null hypothesis was rejected. This is consistent with a study by Cheruiyot et al. (2019) among university students. In the study, Cheruiyot et al. reported that accessibility, testing hours, and mobility of testing facilities were barriers to testing. This is consistent with the current study, as out of 220 respondents who reported not using HTC services, 26.8% indicated it was due to not wanting to be seen by someone, 17.7% reported that it was due to the cost of the test, while 17.3% reported the reason for not using HTC services was due to not knowing the location of the test sites. Also, Gyasi and Abass (2018) conducted a study and found that social stigma affects HIV counseling and testing (HCT) utilization. Furthermore, fear of testing positive, embarrassment, shyness, and fear of the

public's reaction were all associated with barriers to HCT usage (Gyasi & Abass, 2018). The findings from the current calls for intervention to explore and dispel the fears and barriers associated with engaging in HTC.

The findings of the logistic regression analysis for cues to action and HTC was statistically significant at $p<0.044$. Therefore, the null hypothesis was rejected. The study results showed that 70.3% of 468 respondents received HTC information through social media, and 56% of 464 heard about HTC from family and friends. The findings are consistent with a study conducted by Dagne et al. (2017), who reported that university students' primary source of voluntary counseling and testing was social media. Also, Nigatu et al. (2021) reported that social media access had a positive relationship with using HTC. Furthermore, exposure to media information about HIV influences individuals to get tested (Kirakoya-Samadoulougou et al., 2017). A study by Clarke et al. (2021) does not support the current research as the authors reported that out of 1,406 respondents, 45.3% indicated receiving information on testing from printed flyers, while 44.9% indicated receiving information from lawn signs from campus. Therefore, it is imperative to consider other methods of disseminating information about HTC to maximize the utilization of HTC services.

The findings of the logistic regression analysis for self-efficacy and HTC was statistically significant at $p<0.001$. Therefore, the null hypothesis was rejected. The study results showed that 69.9% of 46 respondents were confident of their ability to use HIV testing services, 80% of 465 respondents could arrange to get tested, while 65% of 468 reported their ability to discuss with family members matters pertaining to HIV. In a

study by Lin et al. (2017), the authors found that low emotional self-efficacy created barriers to motivation or in looking for information on HIV testing. Additionally, the authors reported that low self-efficacy, associated with HIV testing, caused anxiety and stress among the study participants (Lin et al., 2017). The current study is consistent with a study conducted by Ramirez-Ortiz et al. (2022), where the authors reported that respondents who reported having higher self-efficacy levels were more likely to engage in HTC services. This is an indicator that self-efficacy is a predictor of HTC uptake. Therefore, increasing the confidence level of university students in HIV testing is recommended to improve the uptake of HTC services.

Overall, the multiple logistic regression analysis findings for the HBM constructs were statistically significant at $p<0.004$. Therefore, the null hypothesis was rejected. Regarding the HBM constructs, the study revealed that 41.5% of the respondents were susceptible to contracting HIV. Also, most respondents 70.5%, perceived high severity of HIV, which is an indication that the respondents viewed HIV to be a serious health problem. Furthermore, 79.1% believed it was beneficial to get a test, while 69.9% believed in their ability to utilize HTC services. The study showed that perceived barriers, perceived cues to action, and perceived self-efficacy were factors that significantly influenced HTC uptake. Therefore, the HBM was appropriate for the current study as it is one of the most widely used conceptual frameworks in health behavior research and has also been applied to previous research studies by Anwuri et al. (2017) and Ayosanmi et al. (2020) on HTC uptake.

Limitations of the Study

The use of a convenience sampling method was a limitation of the current study as the respondents did not represent the entire student population of first-year, second-year, or third-year students. Therefore, the study's results cannot be generalized to the entire population of university students in the Southwest Region of Cameroon. Also, the information provided for the current study was based on self-reports of the respondents who might have provided socially desirable responses because of the study's sensitive nature. However, the respondents might have been encouraged to provide honest answers due to the anonymous questionnaire. Also, correlational studies can only determine associations and not cause and effect. Despite the current limitations, the current research findings can provide information for policymakers and researchers.

Recommendations

I used the G*Power to calculate the sample size for the current study and the minimum sample size was attained based on the formula calculations. I identified future research opportunities and changes in public health practice that can assist in enhancing public health services, care, and outcomes in utilizing HTC services among university students. Future research can be conducted using longitudinal studies where new students are followed for 3 years to compare HTC utilization over time. Additionally, the probability sampling technique can be used to sample the participants so that the results can be generalized to the target population. Furthermore, the University can set up or create peer educator positions where the educators attend various campus events promoting HTC utilization. It is also imperative to design HIV prevention and HTC

services at the university by offering inexpensive or free HTC services, which can assist in increasing HTC utilization. Additionally, normalizing HIV testing by conducting them during medical appointments, thereby assisting in reducing or removing stigma, as Meka et al. (2020) reported stigma as a deterrent to HTC. Furthermore, another recommendation is that other theories can be used to repeat the study.

Implications

The study provided valuable information that can be used to plan and implement HTC programs among university students. Also, the study provided vital information that can be used in addressing the health needs of university students about HTC. The potential to positively impact social change exists as the study findings can assist public health leaders, community organizations, faith-based organizations, and educators in creating and implementing programs to increase access to HTC. Interventions to increase HTC uptake among university students in southwest Cameroon should aim to reduce their perceived barriers to HTC uptake, increase their self-efficacy and provide them with cues to action for HTC uptake.

The findings show that use of HTC was low (51.8%), this low usage could be due to the distance to testing sites, and cost of getting tested which calls for a concern. The concern can be addressed by establishing more testing sites in close proximity and having reduced fees or no fees for HTC services, thereby making HTC more accessible and affordable. This will lead to prevention practices regarding HIV. Those who test negative would be empowered to indulge in safe sexual practices to prevent HIV contraction. In contrast, those who test positive will be empowered to adhere to ART to live a healthy

life and prevent transmission of the virus to others. Therefore, the HBM can be used to explain change and in the maintenance of health-related behaviors as a guiding framework for health behavior intervention (Hong et al., 2021).

Conclusion

The prevalence rate of HIV in Cameroon West Africa is 3.7%, 3.6% in South West compared to 5.7% in Buea, which is a city in the Southwest region of Cameroon. The university where the current research was conducted is also located in the Southwest region of Cameroon.

Study results indicated that the rate of HTC was high among the respondents. The HBM constructs that were associated with HTC utilization were perceived barriers, cues to action, and self-efficacy. Health promotion programs to increase HTC usage should focus on strengthening the cues to action for university students while reducing barriers to HTC services. Increasing HTC usage among university students in the Southwest region of Cameroon can assist in attaining the SDG 3, target 3.3 to be exact, which calls for an end to the AIDS epidemic by 2030 (UNAIDS, 2015, 2017a; (WHO, 2018). Though students believe using HTC services effectively reduces the HIV threat, students can still be deterred from engaging in HTC services (Agamlor et al., 2019). Therefore, implementing interventions that can assist in reducing/eliminating the determents, such as free HTC services and more accessible HTC sites, can assist with increasing HTC usage, thereby improving the lives of individuals, their families, and their communities as a whole. The HBM was, therefore, appropriate for this study as it has been used to guide

disease prevention and health promotion programs (Hong et al., 2021; Rosenstock et al., 1988).

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Appendix A: Email Correspondences for Permission to Use Questionnaires

From: [redacted]

Sent: Tuesday, April 27, 2021 3:09 AM

To: Lilian Pencille [redacted]

Subject: Re: Permission to use questionnaires

Hi Lilian,

Thanks for the reminder. You can find the questionnaire in the attachment, although the lay-out is not as it should be.

God luck with your research, and I am curious to read the result.

[redacted]

From: [redacted]

Sent: Thursday, May 6, 2021 8:36 AM

To: Lilian Pencille [redacted]

Subject: Re: Contacts for questionnaires.

Lilian Pencille

Hi Lilian,

Just to clarify, you are free to modify the questionnaire according to your research design. You are borrowing the concept of my questionnaire and as such, not obligated to use it verbatim.

Let me know if you have any questions.

Best Regards,

[redacted]

Appendix B: Original Questionnaire

Topic: Research among students about willingness in HIV voluntary testing
Dear participant,

This questionnaire is intended to measure your opinion about Voluntary Counselling and Testing. The questionnaire is strictly anonymous, and the data will be handled with care. The researchers will not look at your individual answers; they are interested in the data derived from all the questionnaires together. It is very important that you answer the questions truthfully, but leave a question open rather than lying. Read the questions carefully. Do not think too long about the questions but tick the answer that comes to your mind first. There are no good or bad answers. If you want to correct an answer, write a cross on the wrong answer and tick the correct box. See the following sample question:

Having an HIV test is good.

Strongly disagree **Strongly agree**

(This answer will be taken into account)

A. This section of the questionnaire is concerned with some general background information. Please tick the right answer.

1. Sex ✂ Male ✂ Female

2. Age years

3. Marital status ✂ Single ✂ Married ✂ Divorced ✂ Other:

4. Year of study ✂ First ✂ Second ✂ Third ✂ Fourth year student

5. Field of study ……

6. Religion ✂ Roman Catholic ✂ Protestant ✂ Moslem ✂ Apostolic
   ✂ Other: … ✂ None

7. Which of the following do you or your family have at home? Please mark as many as necessary:
   ✂ Telephone (Cell phone)
   ✂ Television

✂ Motorcar

✂ Electricity

8. What type of dwelling do your parents/guardians live in? Please mark more than one if necessary:

   ✂ Mud hut

   ✂ Brick house

   ✂ House with tiled roof

B. This part of the questionnaire is concerned with your knowledge about HIV. Please tick the answer that you believe is correct.

1. HIV is spread by kissing.
   True ✂ False ✂

2. A person can get HIV by sharing kitchens and bathrooms with someone who has HIV.
   True ✂ False ✂

3. HIV cannot be transmitted by coughs and sneezes.
   True ✂ False ✂

4. A person must have many different partners to get HIV.
   True ✂ False ✂

5. Washing your genitals after sex helps to protect against HIV.
   True ✂ False ✂

6. A pregnant woman can give HIV to her baby.
   True ✂ False ✂

7. A person can get rid of HIV by having sex with a virgin.
   True ✂ False ✂

8. There is a cure for HIV.
   True ✂ False ✂

C. The next questions are about your opinion about having an HIV test. Please tick the answer that is most appropriate for you (from left to right): Strongly disagree, Disagree, Neutral, Agree, Strongly agree.

1. Getting tested for HIV helps people feel better.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

2. Getting tested for HIV helps people from getting HIV.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

3. People in my life would leave me if I had HIV.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

4. People who test HIV positive should hide it from others.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

5. I would rather not know if I have HIV.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

D. The following questions are concerning your opinion of people living with HIV or AIDS. Please tick the answer that is most appropriate for you (from left to right): Strongly disagree, Disagree, Neutral, Agree, Strongly agree.

1. People who have HIV or AIDS are dirty.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

2. People who have HIV or AIDS are cursed.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

3. People who have HIV or AIDS should be ashamed.

Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

4. It is safe for people who have HIV or AIDS to work (e.g. as a teacher) with children.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

5. People with HIV or AIDS must expect some restrictions on their freedom.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

6. A person with HIV or AIDS must have done something wrong and deserves to be punished.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

7. People who have HIV or AIDS should be isolated.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

8. I do not want to be friends with someone who has HIV or AIDS.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

9. People who have HIV or AIDS should not be allowed to work.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

E. The following questions are concerned with feelings and concerns you might have when you go for an HIV test. Please tick the answer that is most appropriate for you (from left to right): Strongly disagree, Disagree, Neutral, Agree, Strongly agree.

1. If I am tested HIV positive, people will be afraid of me.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

2. If I am tested HIV positive, people will avoid touching me.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

3. If I am tested HIV positive, people will grow more distant.

Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

4. If I am tested HIV positive, people will reject me.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

5. If I am tested HIV positive, people will be uncomfortable around me.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

6. If I am tested HIV positive, my family/friends will be rejected.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

F. This part of the questionnaire is concerned with your own perceptions about contracting HIV and AIDS. Please tick the answer that is most appropriate for you (from left to right): Strongly disagree, Disagree, Neutral, Agree, Strongly agree.

1. It is not likely that I will contract HIV/AIDS.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

2. It is possible that I will ever contract HIV/AIDS.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

3. I am at risk for contracting HIV/AIDS.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

4. Everybody is at risk for HIV/AIDS.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

5. When I do not go for an HIV test, it is likely that I have HIV/AIDS without knowing it.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

6. When I do not go for an HIV test, it is possible that I will have HIV/AIDS without knowing it.

Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

G. This part of the questionnaire is concerned with your own perceptions related to HIV and AIDS. Please tick the answer that is most appropriate for you (from left to right): Strongly disagree, Disagree, Neutral, Agree, Strongly agree.

1. I believe that HIV/AIDS is a severe health problem.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

2. HIV/AIDS is a disease with significant consequences.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

3. HIV/AIDS is not a life-threatening disease.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

4. HIV/AIDS is a disease with much impact on one's life.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

5. HIV/AIDS is a hopeless disease.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

H. These questions are intended to measure your feelings about HIV testing. Please tick the answer that is most appropriate for you (from left to right): Strongly disagree, Disagree, Neutral, Agree, Strongly agree.

1. I would rather not know my HIV status than risk being told I am HIV positive.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

2. I do not want to test because a positive result would make me feel depressed.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

3. It's much better to live with an uncertain HIV status than waking up every morning actually knowing you are HIV positive.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

4. Fear of a positive result puts me off testing.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

5. I would rather get ill than find out that I was HIV positive.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

I. The following questions will address the attitude of your family and friends towards HIV testing. Note that these questions are about *your* perception of your friends' and family's attitudes. Please tick the answer that is most appropriate for you (from left to right): Strongly disagree, Disagree, Neutral, Agree, Strongly agree.

1. My parents would support me if they knew that I decided to be tested for HIV.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree
   Not applicable ✂

2. My brother(s) and/or sisters(s) would support me if they knew that I decided to be tested for HIV.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree
   Not applicable ✂

3. My friends would support me if they knew that I decided to be tested for HIV.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree
   Not applicable ✂

4. My partner would support me if he/she knew that I decided to be tested for HIV.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree
   Not applicable ✂

5. I think that my parents have had one or more HIV tests.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree
   Not applicable ✂

6. I think that my brother(s) and/or sister(s) have had one or more HIV tests.

   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree
   Not applicable ✂

7. I think that some of my friends have had one or more HIV tests.

   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree
   Not applicable ✂

8. I think that my partner has had one or more HIV tests.

   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree
   Not applicable ✂

9. My parents hold a negative attitude towards HIV testing.

   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree
   Not applicable ✂

10. My brother(s) and or sisters(s) hold a negative attitude towards HIV testing.

    Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree
    Not applicable ✂

11. My friends hold a negative attitude towards HIV testing.

    Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree
    Not applicable ✂

12. My partner holds a negative attitude towards HIV testing.

    Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree
    Not applicable ✂

J. Suppose that you wanted to have an HIV test, how confident would you feel about your chances of getting one. Please tick the answer that is most appropriate for you (from left to right): Strongly disagree, Disagree, Neutral, Agree, Strongly agree.

1. I could easily arrange to have an HIV test, if I wanted to.

Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

2. If I wanted to have an HIV test, I would find it difficult to make an appointment for it.

   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

3. If I wanted to have an HIV test, I would find it difficult to turn up for the appointment.

   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

4. If I wanted to have an HIV test, I would find it difficult to tell a health worker about my sexual risk behaviour.

   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

5. If I wanted to have an HIV test, I would find it difficult to obtain the results of the test.

   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

6. If I wanted to have an HIV test, I would be able to deal with a possible HIV+ diagnosis.

   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

K. The following questions are concerned with practical barriers of HIV testing that you perceive. Please tick the answer that is most appropriate for you (from left to right): Strongly disagree, Disagree, Neutral, Agree, Strongly agree.

1. I do not have transportation to get to an HIV testing site.

   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

2. I do not have enough time to go for an HIV test.

   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

3. I do not want to go for an HIV test because I do not like needles.

   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

4. Having an HIV test is inexpensive.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

L. This part of the questionnaire is about your beliefs regarding the accuracy of HIV tests and the accessibility to AIDS medication in Tanzania. Please tick the answer that is most appropriate for you (from left to right): Strongly disagree, Disagree, Neutral, Agree, Strongly agree.

1. All HIV tests give accurate results.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

2. All HIV tests provide unreliable results.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

3. It is likely that an HIV test gives a false result.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

4. It is easy for people with HIV to obtain AIDS medication.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

5. AIDS medication is widely available in Tanzania.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

6. If diagnosed with HIV, I am confident that I would receive an adequate treatment.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

M. The following questions are concerned with your opinion about HIV testing centres. Please tick the answer that is most appropriate for you (from left to right): Strongly disagree, Disagree, Neutral, Agree, Strongly agree.

1. If I am tested HIV-positive, health workers will tell my partner.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

2. If I am tested HIV-positive, health workers will discriminate against me.

Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

3. If I am tested HIV-positive, it will be used against me.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

4. I am afraid that the person who will test me for HIV might tell others.
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

5. Health professionals will not judge me when I ask for an HIV-test
   Strongly disagree ✂ ✂ ✂ ✂ ✂ Strongly agree

N. This part of the questionnaire is about your sexual behaviour. Please tick the correct answer.

1. Have you ever had sexual intercourse?

✂ Yes ✂ No

If no, proceed to section O.

2. Have you ever had sexual intercourse with a casual partner without using a condom? Please tick the answer that is most appropriate for you (from left to right): Never, Sometimes, Now and then, Often, Very often.
   Never ✂ ✂ ✂ ✂ ✂Very often

3. Have you had two or more sex partners?

✂ Yes ✂ No

4. During the past 12 months, has a doctor or other health professional told you that you had a sexually transmitted infection (STI), for example herpes, gonorrhea, chlamydia, genital warts?

✂ Yes ✂ No

O. The following questions are concerned with you HIV testing history. Please tick or fill in the correct answer.

1. Have you ever been tested for HIV? Please note that I do not need to know your serostatus.

   ✂ Yes ✂ No

   If no, proceed to question 5 in this section

2. How many times have you been tested for HIV? ……..... times

3. Did you get the result of your last HIV-test?

   ✂ Yes ✂ No

4. What was the main reason to be tested? Tick as many answers as necessary.

   ✂ Pregnancy

   ✂ Marriage/cohabitation

   ✂ Felt sick

   ✂ Feared to be infected

   ✂ Hospitalisation

   ✂ Insurance

   ✂ Blood donation

   ✂ Screening programme

   ✂ Former sex partner is HIV+

   ✂ Discovered that partner was unfaithful.

   ✂ Other:

   ……..

5. Has anybody recommended an HIV-test?

   ✂ Yes ✂ No

If no, proceed to section P.

6. If yes, who recommended the test? Tick as many answers as necessary.
   ✂ Doctor ✂ Partner ✂ Family ✂ Friend ✂ Other: ……

P. The following questions will ask you about the likelihood that you will go for an HIV test in a particular situation. Please tick the answer that is most appropriate for you (from left to right): Very unlikely, Unlikely, Neutral, Likely, Very likely.

1. Suppose you have had unprotected sex with a steady partner, how likely is it that you would go for an HIV-test?
   Very unlikely ✂ ✂ ✂ ✂ ✂Very likely

2. Suppose you have had unprotected sex with a casual partner, how likely is it that you would go for an HIV-test?
   Very unlikely ✂ ✂ ✂ ✂ ✂Very likely

3. Suppose you have been diagnosed with a sexually transmitted infection (STI), how likely is it that you would go for an HIV-test?
   Very unlikely ✂ ✂ ✂ ✂ ✂Very likely

4. Suppose you have heard that a former sexual partner is HIV-positive, how likely is it that you would go for an HIV-test?
   Very unlikely ✂ ✂ ✂ ✂ ✂Very likely

5. Suppose you were feeling ill, how likely is it that you would go for an HIV-test?
   Very unlikely ✂ ✂ ✂ ✂ ✂Very likely

6. Suppose you discovered being pregnant, how likely is it that you would go for an HIV-test?
   Very unlikely ✂ ✂ ✂ ✂ ✂Very likely
   Not applicable ✂

7. Suppose you started a new relation, how likely is it that you would go for an HIV test?
   Very unlikely ✂ ✂ ✂ ✂ ✂Very likely

8. Suppose your partner pressured you to get tested, how likely is it that you would go for an HIV-test?
   Very unlikely ✂ ✂ ✂ ✂ ✂Very likely

Thank you very much for your participation!

Appendix C: Recruitment Flyer

Recruitment flyer: Social media post/email invitation

- Ph.D. student Lilian Pencille seeks 312 study participants.
- University students in Southwest Cameroon.
- To participate in a research study about HIV testing and counseling.
- Survey is voluntary and anonymous (Walden University's approval number for this study is 06-10-22-0825387 and expires on June 9, 2023.)
- Your name and personal identification will not be collected.
- Questionnaire can take up to 20 minutes to complete.

Study requirements:

- 18 years old or older
- University students in Southwest Cameroon
- Be able to read English
- Be a first year, second year or third year student.

To anonymously volunteer, please click the following link:
https://www.surveymonkey.com/r/3GKHLJN

Thank you for your time,
Lilian Pencille

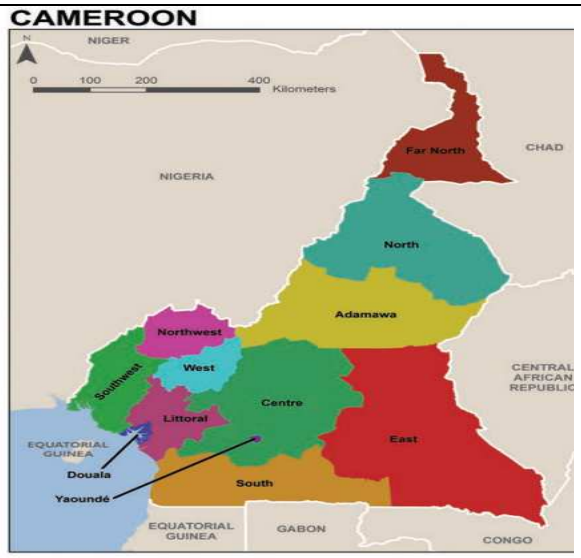
Appendix D: Current Study Questionnaire Coding Manual

The purpose of this cross-sectional correlational quantitative study is to explore the relationship between the constructs of the HBM (perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action and self-efficacy) and uptake of HIV testing and counseling while controlling for age, sex, settlement type, relationship status, area of residence, religious affiliation and level of education. The information collected is solely for academic purposes. Anonymity of responses is ensured as names are not collected and will not be included in the final report.

Date: _____

Please carefully read the questions or statements below and provide your response by ticking/circling the appropriate response.

NO.	QUESTIONS	RESPONSE		
	SECTION A: INFORMATION ABOUT YOU		**CODE**	**Variable Response**
1.	How old were you on your last birthday? (Write in the number)	1. _____ 1. Prefer to Not Answer		
2.	What is your sex?	1. Male 2. Female 3. Non-Binary 4. Prefer to Not Answer 5. Don't Know	0 1 2 98 99	
3.	What is your settlement type?	1. Urban 2. Semi-rural 3. Rural	1 2 3	
4.	Current relationship status?	1. Never married 2. Married 3. Cohabiting 4. Other (Specify: _____) 5. Prefer to not answer 6. Don't Know	1 2 3 4 98 99	
5.	What area of Cameroon do you live in?	1. Southwest 2. Northwest 3. Littoral 4. West 5. Other (Specify: _____) 6. Prefer to not answer. 7. Don't Know	1 2 3 4 5 98 99	

				
6.	What is your religious affiliation?	1. Christianity 2. Islam 3. African Traditional 4. Other (Specify:__) 5. None. 6. Prefer to not answer. 7. Don't know	1 2 3 4 5 98 99	
7.	What is your current level of education?	1. First year 2. Second year 3. Third year 4. Other (Specify:_) 5. Prefer to not answer 6. Don't know	1 2 3 4 98 99	

NO.	QUESTIONS	RESPONSE	CODE	
	SECTION B: HIV/AIDS KNOWLEDGE			
1.	Have you heard about HIV/AIDS?	1. Yes 2. No 3. Prefer to not answer 4. Don't know	1 2 98 99	
2.	Can a healthy person have the HIV/AIDS virus?	1. Yes 2. No 3. Prefer to not answer 4. Don't know	1 2 98 99	
3.	Can consistent condom during vaginal and/or anal sex use reduce one's chances of getting HIV?	1. Yes 2. No 3. Prefer to not answer 4. Don't know	1 2 98 99	
4.	Can having one faithful uninfected sexual partner reduce one's chances of getting HIV?	1. Yes 2. No 3. Prefer to not answer	1 2 98	

		4. Don't know	99	
5.	Can the HIV virus be transmitted by the bite of mosquito?	1. Yes 2. No 3. Prefer to not answer 4. Don't know	1 2 98 99	
6.	Can the HIV virus be transmitted by supernatural means?	1. Yes 2. No 3. Prefer to not answer 4. Don't know	1 2 98 99	
7.	Can a person become infected by sharing food with a person who has HIV/AIDS?	1. Yes 2. No 3. Prefer to not answer 4. Don't know	1 2 98 99	
SECTION C: HIV TESTING AND COUNSELING				
1.	Have you heard about HIV voluntary testing and counseling?	1. Yes 2. No 3. Prefer to not answer 4. Don't know If yes, (move to Q16) If no, (move to Q17)	1 2 98 99	
2.	If Yes, where did you hear about HIV testing and counseling?	1. Health facility 2. Mass media 3. Family 4. Friends 5. Other (Specify: ____)	1 2 3 4 5	
3.	Do you know where HIV testing and counseling services are provided?	1. Yes 2. No 3. Prefer to not answer 4. Don't know If yes, (move to Q4) If no, (move to Q5)	1 2 98 99	
4.	If yes, where is the HIV testing and counseling service provided?	1. Government clinic/Hospital 2. Private clinic/Hospital 3. Voluntary testing center 4. Other (specify: ___)	1 2 3 4	
SECTION D: HIV TESTING AND COUNSELING UTILIZATION				
1.	Have you ever been tested for HIV by a health professional?	1. Yes 2. No 3. Prefer to not answer 4. Don't know If yes, then (skip Q2.) If no, (move to Q4)	1 2 98 99	
2.	When was the last time you had the test?	1. Less than 3 months 2. 3- 6 months 3. 6months - 1 year 4. 1- 2 years 5. More than 2 years ago	1 2 3 4 5	
3.	Why did you undertake an HIV test?	1. To know my status 2. To get married 3. Blood donation requirement 4. Pregnancy or prenatal requirement 5. Concerns from my partner	1 2 3 4 5	

		6. Other (specify: _____)	6	
4.	Why did you not undertake an HIV test?	1. Do not know where to go for the test 2. Not sexually active 3. Cost of test 4. Someone might see me 5. Other (specify: _____)	1 2 3 4 5	
SECTION E: HIV PERCEPTION				
	PERCEIVED SUSCEPTIBILITY I			
1.	I am at high risk of contracting HIV	□Strongly disagree □Disagree □ Neutral □Agree □Strongly agree □ Prefer to not answer □ Don't know	1 2 3 4 5 98 99	
2.	It is possible that I can contract HIV at some point in time if I do not protect myself	□Strongly disagree □Disagree □ Neutral □Agree □Strongly agree □ Prefer to not answer □ Don't know	1 2 3 4 5 98 99	
3.	I worry a lot about getting HIV	□Strongly disagree □Disagree □ Neutral □Agree □Strongly agree □ Prefer to not answer □ Don't know	1 2 3 4 5 98 99	
	PERCEIVED SEVERITY II			
1.	I believe HIV is a severe health problem	□Strongly disagree □Disagree □ Neutral □Agree □Strongly agree □ Prefer to not answer □ Don't know	1 2 3 4 5 98 99	
2.	HIV is a serious condition that I will live with my entire life	□Strongly disagree □Disagree □ Neutral □Agree □Strongly agree □ Prefer to not answer □ Don't know	1 2 3 4 5 98 99	
3.	HIV will interfere with my social life	□Strongly disagree □Disagree □ Neutral □Agree □Strongly agree □ Prefer to not answer □ Don't know	1 2 3 4 5 98 99	
	PERCEIVED BENEFITS III			

1.	It is important to know your HIV status, so that if you are positive, you will not infect others	□Strongly disagree □Disagree □ Neutral □Agree □Strongly agree □ Prefer to not answer □ Don't know	1 2 3 4 5 98 99	
2.	It is easy for people with HIV to get AIDS medication	□Strongly disagree □Disagree □ Neutral □Agree □Strongly agree □ Prefer to not answer □ Don't know	1 2 3 4 5 98 99	
3.	I am confident I will receive adequate treatment if I am diagnosed positive	□Strongly disagree □Disagree □ Neutral □Agree □Strongly agree □ Prefer to not answer □ Don't know	1 2 3 4 5 98 99	
	PERCEIVED BARRIERS IV			
1.	I will be stigmatized or discriminated against if family or friends get to know that am HIV positive	□Strongly disagree □Disagree □ Neutral □Agree □Strongly agree □ Prefer to not answer □ Don't know	1 2 3 4 5 98 99	
2.	Health workers cannot be trusted as they can leak out your results	□Strongly disagree □Disagree □ Neutral □Agree □Strongly agree □ Prefer to not answer □ Don't know	1 2 3 4 5 98 99	
3.	The HIV testing center is far away from my place of residence	□Strongly disagree □Disagree □ Neutral □Agree □Strongly agree □ Prefer to not answer □ Don't know	1 2 3 4 5 98 99	
4.	I am afraid of HIV positive test results	□Strongly disagree □Disagree □ Neutral □Agree □Strongly agree □ Prefer to not answer □ Don't know	1 2 3 4 5 98 99	
5.	The location of the HIV testing center is not convenient for me	□Strongly disagree □Disagree □ Neutral □Agree	1 2 3 4	

		□Strongly agree □ Prefer to not answer □ Don't know	5 98 99	
	CUES TO ACTION V			
1.	Knowing someone who had tested for HIV motivated me to undertake HIV test	□Strongly disagree □Disagree □ Neutral □Agree □Strongly agree □ Prefer to not answer □ Don't know	1 2 3 4 5 98 99	
2.	Hearing HIV voluntary testing and counseling from friends and family made me undertake HIV test	□Strongly disagree □Disagree □ Neutral □Agree □Strongly agree □ Prefer to not answer □ Don't know	1 2 3 4 5 98 99	
3.	Knowing someone died of HIV made me to undertake a test to know my status	□Strongly disagree □Disagree □ Neutral □Agree □Strongly agree □ Prefer to not answer □ Don't know	1 2 3 4 5 98 99	
4.	I often hear about HIV testing to know your status on mass media	□Strongly disagree □Disagree □ Neutral □Agree □Strongly agree □ Prefer to not answer □ Don't know	1 2 3 4 5 98 99	
	PERCEIVED SELF-EFFICACY VI			
1.	I am confident I can use HIV testing services	□Strongly disagree □Disagree □ Neutral □Agree □Strongly agree □ Prefer to not answer □ Don't know	1 2 3 4 5 98 99	
2.	I could arrange to have an HIV test if I want to	□Strongly disagree □Disagree □ Neutral □Agree □Strongly agree □ Prefer to not answer □ Don't know	1 2 3 4 5 98 99	
3.	If I want an HIV test, I will find it difficult to turn up for the appointment	□Strongly disagree □Disagree □ Neutral □Agree □Strongly agree □ Prefer to not answer □ Don't know	1 2 3 4 5 98	

			99	
4.	I can openly discuss HIV matters with my family.	□Strongly disagree □Disagree □ Neutral □Agree □Strongly agree □ Prefer to not answer □ Don't know	1 2 3 4 5 98 99	

Thank you very much for your time.

SurveyMonkey survey link and survey: https://www.surveymonkey.com/r/5Q7NCV8

HIV Testing and Counseling Uptake Predictors Among Students in a Southwest University Cameroon.
Welcome to the "HIV Testing and Counseling Uptake Predictors" Survey
Thank you for participating in the survey. Your feedback is important.

This is a Completely Confidential Online Survey - Your identity will remain anonymous.

H**IV Testing and Counseling Uptake Predictors Among Students in a Southwest University Camer**
Recruitment flyer
Volunteers wanted for a research study

Hello, my name is Lilian Pencille and I am a Ph.D. student at Walden University. I am currently working on my dissertation title "HIV Testing and Counseling Uptake Predictors Among Students in a Southwest University Cameroon". I am looking for current students in a Southwest university in Cameroon who are 18 years of age or older and in their first, second or third year of school. Participation in the study of why university students do not participate in HIV testing and counseling is voluntary and participants can withdraw at any time without any implications. The questionnaire can take about 15 minutes to complete.

There are no potential risks associated with participating in the research as the study is looking at group responses and not individual responses. There might be minor discomfort associated with participation and if that happens, you can call the Cameroon Emergency Hotline at 17117. A potential benefit is that the participants can assist in providing valuable information by giving insight as to reasons students in a Southwest university in Cameroon are unwilling to participate in HIV testing and counseling. Another potential benefit is that information collected can assist in impacting positive social change through policy implementation and resource linkage to meet the needs of the students.

Permission to conduct the study which involves human subjects, will be requested

through the Institutional Review Board (IRB) at Walden University. If you would like to speak privately about your rights as a participant, you can call Dr. Leilani Gjellstad at 612-312-1210 or email her at irb@mail.waldenu.edu. She is the Walden University representative who can discuss this with you. Walden University's approval number for this study is IRB will enter the approval number here and it expires on IRB will enter the expiration date. The faculty advisor for the research is Dr. Richard Jiménez and he can be reached at richard.jimenez@mail.waldenu.edu. If you meet the criteria and are interested in completing the survey, please click the ok button below to provide consent and take part in the survey.

Thank you for your time and participation.

Informed consent

During the data collection process for the research "HIV Testing and Counseling Uptake Predictors Among Students in a Southwest University Cameroon", I will have access to confidential information that should not be disclosed.
I acknowledge that disclosing of improper information can be damaging to other participants therefore the information must remain confidential. By signing this confidential agreement, I am acknowledging and in agreement that:

· I will not make any inquiries, modifications or purge confidential information that is unauthorized.
· I understand that it is unacceptable to discuss confidential information even without mentioning the name of a participant.
· I will not discuss confidential information where the conversation can be overhead.
· I will only use devices or systems that I am authorized to use and to access.
· I will not share or demonstrate system functions or devices to unauthorized individuals.
· I will not discuss or disclose any confidential information with others including family or friends.
· I understand personal identifiable information will not appear anywhere in the findings in the study findings.
· I understand that I can withdraw from participating at any time and there will be no implications to do so.
· I understand that there are no potential risks associated in participating in the research as the study is looking at group responses and not on an individual basis.
· There might be minor discomfort associated with participation and if that happens, you can call the Cameroon Emergency Hotline at 17117.
· I understand that potential benefit include the collection of valuable information to assist in providing insight as to reasons students in a Southwest university in Cameroon are unwilling to participate in HIV testing and counseling.

· I understand that another potential benefit is that information collected can assist in impacting positive social change through policy implementation and resource linkage to meet the needs of the students.
· If as a result of taking this survey you wish to speak with someone about HIV/AIDS or your health, you can call 233-323-388.

By clicking the ok button below, I acknowledge that I have read the agreement and I agree to comply with all the terms and conditions stated above. I voluntarily agree to be a participant.

Survey questions
Please carefully read the questions or statements below and provide your response by ticking/selecting the appropriate response.

Fill in the information for question 1 (and any others) or select/tic one response for all other questions.

SECTION A: Information about you.

1. How old were you on your last birthday?

☐ Prefer to not answer

Write in the number _____

Click or tic the appropriate response for the remainder of the questions.

2. What is your sex?

☐ Male
☐ Female
☐ Non-Binary
☐ Prefer to Not Answer
☐ Don't know

3. What is your settlement type?

☐ Urban
☐ Semi-rural
☐ Rural
☐ Prefer to Not Answer
☐ Don’t Know

4. Current relationship status

☐ Never married
☐ Married
☐ Cohabiting
☐ Other (Specify)

- ☐ Prefer to Not Answer
- ☐ Don't Know

5. What area of Cameroon do you live in?

- ☐ Southwest
- ☐ Northwest
- ☐ Littoral
- ☐ West
- ☐ Other (Specify)
- ☐ Prefer to Not Answer
- ☐ Don't Know

6. What is your religious affiliation?

- ☐ Christianity
- ☐ Islam
- ☐ African Traditional
- ☐ Other (Specify)_____
- ☐ None
- ☐ Prefer to Not Answer
- ☐ Don't Know

7. What is your current level of education?

- ☐ First year
- ☐ Second year
- ☐ Third year
- ☐ Other (specify)_____
- ☐ Prefer to Not Answer
- ☐ Don't Know

SECTION B: HIV/AIDS Knowledge

8. Have you heard about HIV/AIDS?

- ☐ Yes
- ☐ No
- ☐ Prefer to Not Answer
- ☐ Don't Know

9. Can a healthy person get HIV/AIDS?

- ☐ Yes
- ☐ No
- ☐ Prefer to Not Answer
- ☐ Don't Know

10. Can consistent condom during vaginal and/or anal sex use reduce one's chances of getting HIV?

- ☐ Yes
- ☐ No
- ☐ Prefer to Not Answer
- ☐ Don't Know

11. Can having one faithful uninfected sexual partner reduce one's chances of getting HIV?

- ☐ Yes
- ☐ No
- ☐ Prefer to Not Answer
- ☐ Don't Know

12. Can the HIV virus be transmitted by the bite of mosquito?

- ☐ Yes
- ☐ No
- ☐ Prefer to Not Answer
- ☐ Don't Know

13. Can the HIV virus be transmitted by supernatural means?

- ☐ Yes
- ☐ No
- ☐ Prefer to Not Answer
- ☐ Don't Know

14. Can a person become infected by sharing food with a person who has HIV/AIDS?

- ☐ Yes
- ☐ No
- ☐ Prefer to Not Answer
- ☐ Don't Know

SECTION C: HIV testing and counseling.

15. Have you heard of HIV voluntary testing and counseling?

- ☐ Yes
- ☐ No
- ☐ Prefer to Not Answer
- ☐ Don't Know

If yes, (move to Q16)
If no, (move to Q17)

16. If Yes, where did you hear about HIV testing and counseling?

- ☐ Health facility
- ☐ Mass media

- ☐ Family
- ☐ Friends
- ☐ Other (Specify: ____)
- ☐ Prefer to Not Answer
- ☐ Don't Know

17. Do you know where HIV testing and counseling services are provided?

- ☐ Yes
- ☐ No
- ☐ Prefer to Not Answer
- ☐ Don't Know

If yes, (move to Q18)
If no, (move to Q19)

18. If yes, where is the HIV testing and counseling service provided?

- ☐ Government clinic/Hospital
- ☐ Private clinic/Hospital
- ☐ Voluntary testing center
- ☐ Other (specify: ___)
- ☐ Prefer to Not Answer
- ☐ Don't Know

SECTION D: HIV Testing and counseling utilization.

19. Have you ever been tested for HIV by a health professional?

- ☐ Yes
- ☐ No
- ☐ Prefer to Not Answer
- ☐ Don't Know

If yes, (move to Q20)
If yes, then (skip Q22.)

20. When was the last time you had the test?

- ☐ Less than 3 months
- ☐ 3- 6 months
- ☐ 6months - 1 year
- ☐ 1- 2 years
- ☐ More than 2 years ago
- ☐ Prefer to Not Answer
- ☐ Don't Know

21. Why did you undertake an HIV test?

- ☐ To know my status
- ☐ To get married
- ☐ Blood donation requirement
- ☐ Pregnancy or prenatal requirement
- ☐ Concerns from my partner
- ☐ Other (specify: _____)
- ☐ Prefer to Not Answer
- ☐ Don't Know

22. Why did you not undertake an HIV test?

- ☐ Do not know where to go for the test
- ☐ Not sexually active
- ☐ Cost of test
- ☐ Someone might see me
- ☐ Other (specify: _____)
- ☐ Prefer to Not Answer
- ☐ Don't Know

SECTION E: HIV perception

Perceived susceptibility I

Click on the response that indicate to what extent you agree or disagree with the following statements:

23. I am at high risk of contracting HIV

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Neutral
- ☐ Agree
- ☐ Strongly agree
- ☐ Prefer to not answer
- ☐ Don't know

24. It is possible that I can contract HIV at some point in time if I do not protect myself.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Neutral
- ☐ Agree
- ☐ Strongly agree
- ☐ Prefer to not answer
- ☐ Don't know

25. I worry a lot about getting HIV

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Neutral
- ☐ Agree
- ☐ Strongly agree
- ☐ Prefer to not answer
- ☐ Don't know

Perceived severity II

26. I believe HIV is a severe health problem

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Neutral
- ☐ Agree
- ☐ Strongly agree
- ☐ Prefer to not answer
- ☐ Don't know

27. HIV is a serious condition that I will live with my entire life

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Neutral
- ☐ Agree
- ☐ Strongly agree
- ☐ Prefer to not answer
- ☐ Don't know

28. HIV will interfere with my social life

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Neutral
- ☐ Agree
- ☐ Strongly agree
- ☐ Prefer to not answer
- ☐ Don't know

Perceived benefits III

29. It is important to know your HIV status, so that if you are positive, you will not infect others

- ☐ Disagree
- ☐ Neutral

- Agree
- Strongly agree
- Prefer to not answer
- Don't know

30. It is easy for people with HIV to get AIDS medication

- Disagree
- Neutral
- Agree
- Strongly agree
- Prefer to not answer
- Don't know

31. I am confident I will receive adequate treatment if I am diagnosed positive

- Disagree
- Neutral
- Agree
- Strongly agree
- Prefer to not answer
- Don't know

Perceived barriers IV

32. I will be stigmatized or discriminated against if family or friends get to know that am HIV positive

- Disagree
- Neutral
- Agree
- Strongly agree
- Prefer to not answer
- Don't know

33. Health workers cannot be trusted as they can leak out your results

- Disagree
- Neutral
- Agree
- Strongly agree
- Prefer to not answer
- Don't know

34. The HIV testing center is far away from my place of residence

- Disagree
- Neutral

- Agree
- Strongly agree
- Prefer to not answer
- Don't know

35. I am afraid of HIV positive test results

- Disagree
- Neutral
- Agree
- Strongly agree
- Prefer to not answer
- Don't know

36. The location of the HIV testing center is not convenient for me

- Disagree
- Neutral
- Agree
- Strongly agree
- Prefer to not answer
- Don't know

Cues to action V

37. Knowing someone who had tested for HIV motivated me to undertake HIV test

- Disagree
- Neutral
- Agree
- Strongly agree
- Prefer to not answer
- Don't know

38. Hearing HIV voluntary testing and counseling from friends and family made me undertake HIV test

- Disagree
- Neutral
- Agree
- Strongly agree
- Prefer to not answer
- Don't know

39. Knowing someone died of HIV made me to undertake a test to know my status

- Disagree
- Neutral

- ☐ Agree
- ☐ Strongly agree
- ☐ Prefer to not answer
- ☐ Don't know

40. I often hear about HIV testing to know your status on mass media

- ☐ Disagree
- ☐ Neutral
- ☐ Agree
- ☐ Strongly agree
- ☐ Prefer to not answer
- ☐ Don't know

Perceived self-efficacy VI

41. I am confident I can use HIV testing services

- ☐ Disagree
- ☐ Neutral
- ☐ Agree
- ☐ Strongly agree
- ☐ Prefer to not answer
- ☐ Don't know

42. I could arrange to have an HIV test if I want to

- ☐ Disagree
- ☐ Neutral
- ☐ Agree
- ☐ Strongly agree
- ☐ Prefer to not answer
- ☐ Don't know

43. If I want an HIV test, I will find it difficult to turn up for the appointment

- ☐ Disagree
- ☐ Neutral
- ☐ Agree
- ☐ Strongly agree
- ☐ Prefer to not answer
- ☐ Don't know

44. I can openly discuss HIV matters with my family.

- ☐ Disagree
- ☐ Neutral

- ○ Agree
- ○ Strongly agree
- ○ Prefer to not answer
- ○ Don’t know

Appendix E: Completion Certificate: CITI Program

CITI PROGRAM

Completion Date 19-Mar-2022
Expiration Date N/A
Record ID 47402067

This is to certify that:

Lilian Pencille

Has completed the following CITI Program course:

Not valid for renewal of certification through CME.

Student's
(Curriculum Group)
Doctoral Student Researchers
(Course Learner Group)
1 - Basic Course
(Stage)

Under requirements set by:

Walden University

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w7a6d48c2-dce0-4456-97d9-7ed847e3a4ca-47402067