Factors Affecting HIV Testing Among Youth in Kenya

Allison Nall

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Factors Affecting HIV Testing Among Youth in Kenya

by

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A thesis submitted in partial fulfillment of the requirements for the degree of Master of Arts
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Abstract

With the high prevalence of HIV among youth in sub-Saharan Africa, it is vital to better understand factors affecting HIV testing among this population; this is the first step in the HIV treatment cascade. Using existing data from the SEERs (Stigma-reduction via Education, Empowerment, and Research) Project, a community-based participatory research program targeting 13-24 year olds in Kenya, the purpose of this study was to examine factors related to behavioral intentions regarding HIV testing. It was hypothesized that HIV knowledge, social support, subjective well-being, and mental health would serve as facilitators to HIV testing while projected stigma and substance use would serve as barriers to HIV testing. In partial support of the hypotheses, findings from a logistic regression analysis revealed that HIV knowledge facilitated HIV testing behavioral intentions. However, unexpectedly, social support was a barrier to HIV testing intentions. These findings have important implications for future research in this area and for this population.
CHAPTER 1

Introduction

Statement of the Problem

The Human Immunodeficiency Virus (HIV) affects over one million people in the United States, with nearly 40,000 new cases diagnosed in 2015 according to the Centers for Disease Control and Prevention (CDC; 2015). The CDC (2015) also estimated that one in every five new diagnoses occurred in adolescents or young adults aged 13-24. To contrast, the Joint United Nations Programme on HIV/AIDS (UNAIDS; 2017b) estimated 1.6 million individuals are living with HIV in Kenya, with about 62,000 new cases occurring in 2016. With a global estimate of nearly 37 million individuals living with HIV and nearly 2 million new cases, the United States boasts a nearly 9% reduction in new diagnoses over the past year. Meanwhile, Sub-Saharan Africa accounts for 64% of all new diagnoses worldwide (UNAIDS, 2017b). Economic and social issues heavily influence the high rates of HIV transmission and AIDS-related deaths in the Sub-Saharan region, and these same conditions create barriers to HIV prevention and treatment.

Purpose of the Study

This study assessed the influence of the following factors on behavioral intentions related to HIV testing: HIV knowledge, stigma, social support, subjective well-being, mental health, and substance use. For the purpose of this study, these factors were conceptualized as facilitators and barriers to HIV testing (see Figure 1). This study is part of a larger research program examining the utility of the HIV SEERs (Stigma-reduction
via Education, Empowerment, and Research) Project, a community-based participatory research project designed to increase HIV knowledge and decrease HIV-related stigma among youth in Kenya.

**Research Questions and Hypotheses**

Framed within the context of social cognitive theory, this study aimed to answer the following question: What is the relative contribution of various factors (HIV knowledge, stigma, social support, subjective well-being, mental health, substance use) on behavioral intentions related to HIV testing among youth in Kenya? It was hypothesized that participants who reported greater HIV knowledge, social support, subjective well-being and depression/anxiety/stress (subscales of mental health) would be more likely to seek HIV testing (facilitators). It was further hypothesized that participants who reported greater HIV projected stigma and substance use would be less likely to seek HIV testing (barriers)(see Figure 1).
CHAPTER 2

Review of the Literature

Prevalence and Incidence Among Youth

The UNAIDS (2014) estimated the number of young people (15-24 years old) living with HIV as of 2012 to be 4.5 million worldwide with rates for young females twice as high as rates for young males. Among the global population of youth age 15-24, there were an estimated 610,000 new cases in 2016 according to the United Nations Children’s Fund (UNICEF; 2017). Approximately 84% of these new cases occurred in Sub-Saharan Africa (UNICEF, 2017). These numbers suggest a need to further investigate HIV prevention efforts among youth, especially in parts of the world with high HIV prevalence rates.

Sub-Saharan Africa accounts for approximately 64% of all new HIV diagnoses worldwide (UNAIDS, 2017b). Of the 630,000 children being administered antiretroviral therapy (ART) in countries designated as low-and middle-income, 544,000 live in Africa according to the World Health Organization (WHO; 2013). This population faces many challenges associated with health services, including stigma, lack of prevention education, and lack of support services and treatment options (UNAIDS, 2014).

HIV Testing as Prevention

In a landmark article, Wilson and Jungner (1968) emphasized the importance of prevention as the first step in slowing the spread of any communicable disease, infection, or condition. From a public health perspective, the practice of screening may help to
detect an infectious disease earlier, offering the patient more options for treatment and presenting fewer opportunities for transmission. This certainly applies in the area of HIV, and the importance of HIV testing as a form of prevention is well documented.

Testing for HIV is a vital step for both treatment and prevention (Gardner, McLees, Steiner, Del Rio, & Burman, 2011). Once aware of HIV infection, patients can begin antiretroviral therapy (ART), which is designed to reduce viral load. Current research suggests people with HIV who have undetectable viral loads are not likely to transmit the virus to others. Thus, identifying cases of HIV through testing and linking newly diagnosed patients to, and retaining them in, care has been shown to be effective for preventing the progression of the virus and eventual spread to others.

Currently, the U.S. Preventative Services Task Force recommends that every individual between the ages of 13 and 64 be routinely screened for HIV in all healthcare settings at least once (Moyer, 2013). Individuals considered to be high-risk (e.g., men who have sex with men, injection drug users, or those presenting with other sexually transmitted infections) should be tested for HIV annually at minimum. According to the Kenya HIV Testing Services Guidelines from the National AIDS and STI Control Programme (2015), all healthcare facilities should offer HIV testing and counseling to adults and adolescents 15 years or older. It is recommended that children 14 years and younger be tested if living in an area identified as having a high incidence of HIV or if the child has been exposed to high-risk situations or environments (e.g., sex work or those whose mothers died from AIDS or for unknown reasons). Parental or guardian consent is required to test children ages 14 and younger in Kenya.
Despite recommendations, many individuals still do not seek testing. The CDC (2015) estimates that only about half of the U.S. population has been tested in their lifetime, and among sexually active, high school aged youth, only about 22% have been tested. Neglecting to be tested for HIV is influenced by many factors, and even physicians may be partially to blame. Physicians may not be following the CDC’s recommendation for routine testing (Zheng, Suneja, Chou, & Arya, 2014). Barriers preventing physicians from following such guidelines include lack of understanding of the recommendations, disagreement or discomfort with the guidelines, and physical barriers related to patients or the testing facility.

One of the most vulnerable populations in the United States is Black men who have sex with men (Levy et al., 2014). While, overall, HIV occurrence is decreasing across the U.S., this population has seen an increase in infections. Factors such as stigma, low income, incarceration, and location of services have been noted as key barriers to this population seeking testing.

In contrast, rates of HIV testing have improved in Sub-Saharan Africa. For example, among pregnant women in Sub-Saharan Africa, earlier estimates suggested that only about 28% were tested for HIV (WHO, UNAIDS, & UNICEF, 2010). However, more recent data suggests that about 69% of pregnant women received HIV testing as part of their prenatal healthcare (Kenya National Bureau of Statistics, Ministry of Health/Kenya, National AIDS Control Council/Kenya, Kenya Medical Research Institute, National Council for Population and Development/Kenya, and ICF International, 2015). Meanwhile, only 46% of women and 53% of men in Kenya’s general population had been tested for HIV, suggesting a need to better understand the facilitators and barriers to

**Facilitators and Barriers to HIV Testing**

It is vital to understand the underpinnings of human behavior when it comes to seeking HIV testing, as this is a key step in controlling the spread of the virus. Without knowledge of one’s HIV status, treatment and secondary prevention (i.e. transmission to others) are impossible. However, barriers to HIV testing exist particularly in areas of high incidence, such as Sub-Saharan Africa. Existing research suggests that facilitators to HIV testing may include high levels of knowledge, social support, subjective well-being, and mental health symptoms (e.g., depression, anxiety, and stress), while barriers may include high levels of perceived stigma and substance use. A conceptual figure is presented in Figure 1. In the sections to follow, both facilitators and barriers to HIV testing are explored.

**HIV knowledge.** Behavioral intentions related to HIV testing may be affected by misconceptions about HIV and how the virus is transmitted (Rueda et al., 2016). Understanding an individual’s HIV knowledge-level is tantamount to understanding how much they perceive risk when engaging in behaviors that could lead to transmission of the virus, such as unprotected sex (Glick & Sahn, 2007). Results from a study conducted by Glick and Sahn (2007) in nine African countries suggest an increase in understanding about risks and preventative measures associated with HIV. Nonetheless, there is still much work to be done in this realm.
Existing research indicates that better understanding the virus may aid individuals in practicing prevention and seeking HIV testing (Okumu et al., 2017). Indeed, Okumu et al. (2017) reported results from a community-based participatory research study of Black individuals in the Southeastern United States that revealed a positive correlation between HIV testing and HIV knowledge. In another study, HIV knowledge was correlated with level of sexual experience and testing for HIV and other STIs among African American adolescents (Swenson et al., 2010).

**Stigma.** HIV-related stigma is a key barrier to HIV testing and treatment (Rueda et al., 2016). Stigma is characterized by the devaluing or discrediting of a person or social group (Goffman, 1963). Stigma can manifest in various forms and be either perceived, anticipated, or believed to be true by an individual or group, notwithstanding HIV status (Turan et al., 2017). Simply put, regardless of whether or not an individual has been tested and is aware of their HIV status, one may hold certain beliefs/preconceptions about individuals with HIV. These beliefs often serve as a barrier to both HIV testing and treatment.

One method being considered as a means to lower stigma related to HIV and HIV testing is to normalize screening for the virus by making screening routine in healthcare settings. In interviews with men aged 18-24, Knight, Small, and Shoveller (2016) found that while, overall, participants viewed routine (as opposed to voluntary) testing as more convenient and less stress-inducing than seeking out testing as a result of high-risk behavior, others felt targeted by routine testing. The latter group noted that appearing to be homosexual, a drug user, or impoverished may have led the clinician to recommend
testing. The authors concluded that while routine testing may break down certain barriers, making those more at risk feel targeted may be a drawback.

In a re-analysis of a 2009 study from South Africa, Maughan-Brown and Nyblade (2014) found that women (but not men) were influenced by stigma when it came to HIV testing. Further analysis of this dataset showed that women were more likely to have been tested for HIV if they had stigmatizing attitudes toward others (e.g. believed that those with HIV were being punished for having multiple sexual partners and had themselves to blame). Conversely, women who reported more perceived stigma, or had personally observed someone with HIV being treated poorly were less likely to seek testing. This research highlights the importance of better understanding the influence of stigma on HIV testing behaviors.

Social support. Social support has also been identified as a key factor in HIV test-seeking and treatment adherence (Rueda et al., 2016). Social support can be conceptualized as the notion of having other individuals to provide reinforcement and emotional support (Smith, Rossetto, & Peterson, 2008). Among nearly 5000 adults in South Africa voluntarily seeking HIV testing and counseling, low social support and poor mental health were associated with testing positively for HIV (Drain et al., 2015). When examining correlates of social support, Drain et al. (2015) found that low social support was most strongly correlated with having no prior HIV testing.

Subjective well-being. Subjective well-being refers to one’s assessment of tangible and intangible evidence of health or quality of life (Gronlie & Dageid, 2017). Among South Africans, subjective well-being was associated with income and social support from family and religious affiliations. Compared to people without HIV,
subjective well-being was also significantly lower among people living with AIDS in Australia and the United States (Hutton, Misajon, & Collins, 2013). These authors reported a negative correlation between stigma and subjective well-being among people living with HIV.

Currently there is no research on the relationship between subjective well-being and HIV testing. However, findings from a study in Portugal suggested subjective well-being is correlated with adherence to antiretroviral medication, indicating its importance in the scope of treatment and living with HIV (Reis, Guerra, & Lencastre, 2013). In their study, Reis, Guerra, and Lencastre (2013) found that patients with greater subjective well-being were more likely to be asymptomatic. Given its impact on how people living with HIV cope and adhere to medication regimens, subjective well-being is a factor of interest among the HIV research community.

**Mental health.** Mental health symptoms such as depression, anxiety, and stress can affect HIV risk exposure as well as HIV testing and treatment (Rueda et al., 2016). Among a sample of 325 men and women in Uganda, depression was correlated with alcohol consumption and intimate partner violence—both risk factors for exposure to HIV (Kiene, Lule, Sileo, Slimi, & Wanyenze, 2017). In South Africa, researchers conducted interviews based on the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) with patients at HIV testing sites and found that 14% of those seeking testing experienced depression, 5% experienced anxiety, and nearly 5% experienced posttraumatic stress disorder (Kagee, Saal, De Villiers, Sefatsa, & Bantjes, 2017). In India, those seeking repeat voluntary testing were found to have significant levels of depression and anxiety (Sahay et al., 2007). In a Taiwanese study, researchers found that
nearly 40% of their sample of men seeking HIV testing reported depression (Lin, Lee, & Yang, 2017).

The relationship between HIV testing and mental health symptoms (e.g., anxiety, depression, stress) may be bidirectional. That is, individuals with mental health symptoms may be at high risk for exposure to HIV and, therefore, more likely to seek testing at the same time that HIV testing may produce symptoms of anxiety, depression, or stress. For example, Worthington and Meyers (2003) identified four themes related to anxiety among individuals seeking HIV testing in Canada: risk to health, stigma, the power dynamic of the patient and test provider, and techniques employed to improve patient control when interacting with test providers. In another study, mothers in rural Kenya reported they may be less likely to take measures to prevent transferring HIV to their infants due to stigma and stress associated with HIV, testing their infants, and seeking drugs to prevent transmission (Kohler et al., 2014).

Yehia et al. (2014) found that individuals with mental illness in the United States were more likely to seek HIV testing than those without a diagnosed mental illness. This research included disorders such as schizophrenia, bipolar disorder, depression, and anxiety, and participants within each category were found more likely to have been tested for HIV than the general population.

**Substance use.** Substance use contributes to HIV on multiple levels; it may put individuals at higher risk of contracting the disease, lower the likelihood of testing for the disease, and affect the ability to adhere to treatment regimens (Rueda et al., 2016). Substance use has been established as a factor that increases HIV risk through engagement in high-risk sexual behavior (e.g. one-night stands, sex without a condom,
multiple partners, sharing needles) (Walter et al., 2016; Strathdee et al., 1997). UNAIDS (2017a) estimates that individuals who use injection drugs are 28 times more likely to be living with HIV. Substance users in Indonesia noted stigma and fear of test results as the major barriers to their seeking HIV testing (Ford, Wirawan, Sumantera, Sawitri, & Stahre, 2004).

Social Cognitive Theory Applied to HIV

Bandura’s (1986) social cognitive theory (SCT) posits that the person, the environment, and one’s behavior equally share influence over one’s learning. The theory is often represented as a triangle, with each factor equally interacting with the other two in a multidirectional relationship. SCT has been applied to health behaviors since these are often learned throughout the lifetime (Bandura, 1994).

Bandura (1994) himself contributed to the HIV/AIDS literature by applying SCT to HIV/AIDS education and prevention. Based on a thorough review of the HIV/AIDS literature, Bandura posited that personal factors (specifically self-efficacy), one’s environment, and behavior are constantly interfacing in a way that influences an individual’s decision to engage in risky sexual behavior or to consider HIV testing. Bandura stressed that while understanding HIV risk behaviors is important, the impact of one’s environment and behavioral changes involved in making sound decisions about HIV prevention are also important. Since Bandura’s theory emphasizes a multidirectional interaction between factors, it cannot be assumed knowledge alone will influence health behaviors.

Researchers in China applied SCT to HIV education in high schools and found that students who were exposed to an intervention program encompassing self-efficacy,
one's environment, and behavior significantly differed from students in a control group (Li, Zhang, Mao, Zhao, & Stanton, 2011). The intervention program focused on HIV knowledge, perceptions, stigma toward those with HIV/AIDS, and behavioral intentions related to testing. A review of the literature suggested that SCT has not been applied to HIV testing specifically.

**Addressing Gaps in the Literature**

While research has identified many factors related to HIV testing, many of these factors have been studied in isolation. The existing literature lacks an examination of the relative impact of various factors on HIV testing. Guided by SCT (see Figure 2), this study aimed to examine the relative impact of the following factors, which can be conceptualized as facilitators and barriers (see Figure 1), on behavioral intentions related to HIV testing: HIV knowledge, stigma, social support, subjective well-being, mental health, and substance use.
CHAPTER 3

Method

Participants and Study Design

This study used existing data from the HIV SEERs Project, a community-based participatory research project involving four components (information, skills building, resources, and personal contact) that was delivered to 1526 participants aged 12-36 in Kenya (Chenneville, Gabbidon, Drake, & Rodriguez, under review). Pre, post, and three-month follow-up questionnaires were administered to evaluate the HIV SEERs Project. Questionnaires were translated using a back-translation method and offered to participants in either English or Swahili, the native language of Kenya. All participants elected to complete the questionnaires in English, which is the language of instruction in Kenya (Roy-Campbell, 2015). For this study, only data from pre-tests completed by youth 13-24 years old were analyzed (n=1161).

Framed by SCT, this study examined the relative contribution of personal, behavioral, and environmental factors affecting HIV testing among youth. Personal factors included HIV knowledge, HIV projected stigma, subjective well-being, mental health and substance use. The environmental factor was social support, and the behavioral factor was HIV testing intent (see Figure 2). These factors were conceptualized as either facilitators or barriers to HIV testing (see Figure 1).
Measures

Behavioral intentions. This scale was developed by the HIV SEERs Project investigators to collect information about HIV treatment-seeking behaviors. Only one item addressing HIV testing behavioral intentions was used in this study: “If you are not HIV-positive, do you plan to be tested for HIV?” Response options included, “Yes,” “No,” and, “I am HIV-positive.” Since this measure consisted of a single item, Cronbach’s alpha was not calculated.

Brief HIV knowledge questionnaire (HIV KQ-18). This 18-item instrument developed by Carey and Schroder (2002) used true/false prompts to measure an individual’s understanding of HIV and methods of transmission. “A person will NOT get HIV if she or he is taking antibiotics,” is an example of the type of items on this measure. Carey and Schroder (2002) reported a Cronbach’s alpha of $\alpha = .75$ to $.89$ across multiple samples, demonstrating the internal consistency of this measure. In the current sample, a Cronbach’s alpha of $\alpha = .40$ was found, $n=1159$.

AIDS-related stigma scale (ARSS). This nine-item instrument developed by Kalichman and colleagues (2005) assessed an individual’s beliefs and projected stigma toward people living with HIV/AIDS. Response choices included Agree or Disagree. Examples of items on this measure included “People who have AIDSs are dirty,” and “People who have HIV should be isolated.” Kalichman and colleagues (2005) reported a Cronbach’s alpha of $\alpha = .75$, demonstrating the internal consistency of this measure across five African communities, and also used test-retest reliability estimates to demonstrate the stability of this measure over a three-month period, $r=.67$. In the current
sample, a Cronbach’s alpha of $\alpha = .46$ was found, $n= 1030$. Only cases with no missing data on this measure were included in the analysis.

**Social provision scale.** The original 24-item measure was adapted to a 12-item measure, which assessed social support using six provisions (attachment, social integration, reassurance of worth, reliable alliance, guidance, and opportunity for nurturance) (Cutrona & Russell, 1987; Weiss, 1974). Participants responded to items such as “There are people I can depend on to help me if I really need it,” using a five-point Likert scale with 1=Strongly Disagree and 5=Strongly Agree. In the original sample, a Cronbach’s alpha of $\alpha = .92$ was reported for the entire scale, demonstrating good internal reliability. In the current sample, a Cronbach’s alpha of $\alpha = .61$ was found, $n=854$. Only cases with no missing data on this measure were included in the analysis.

**Subjective well-being scale.** This measure gauged well-being on a ten-point Likert scale with 1=Extremely Unhappy and 10=Extremely Happy using a single question, “Taking all things together, how happy are you?” (Layard, 2010). Since this measure consisted of a single item, Cronbach’s alpha was not calculated in the original or current sample, $n= 930$.

**Depression, anxiety, and stress scale (DASS-21).** This 21-item measure by Lovibond and Lovibond (1995) was utilized as a means of measuring depression, anxiety, and stress (the three subscales of the measure) in a single assessment. Examples of items from this measure included “I felt scared without any good reason” and “I felt I was close to panic.” This measure used a four-point Likert scale with 0=Did not apply to me at all and 3= Applied to me very much or most of the time. Cronbach’s alphas ranging from $\alpha = .87$ to $\alpha = .94$ across the three subscales have been reported, demonstrating good
internal reliability (Anthony, Bieling, Cox, Enne, & Swinson, 1998). In the current sample, the Cronbach's alphas were $\alpha = .87$ for the depression scale ($n=811$), $\alpha = .87$ for the anxiety ($n=841$), and $\alpha = .86$ for the stress scale ($n=850$). Only cases with no missing data on this measure were included in the analysis.

**CRAFFT screening tool for adolescent substance abuse (CRAFFT).** The CRAFFT is a nine-item, yes/no measure of an individual's experiences with drugs and alcohol (Knight et al., 1999). The assessment was divided into two sections: three behaviors within the last 12 months, and six behaviors over the lifetime. Example items from this measure included "During the past 12 months, did you smoke any marijuana or hashish?" and "Do you ever forget things you did while using alcohol or drugs?" The authors reported a Cronbach's alpha of $\alpha = .79$, demonstrating good overall reliability of this measure. In the current sample, a Cronbach's alpha of $\alpha = .63$ was found for the last six items.

**Procedure**

The Institutional Review Board at the University of South Florida reviewed this project and deemed it exempt given its use of existing data from the HIV SEERs Project, a community-based participatory research project. Only data from the pre-test questionnaires administered to HIV SEERs participants were used in this study. Data from participants who identified as HIV-positive at the time of the pre-test were excluded from analyses. For more information on the HIV SEERs Project, please refer to Chenneville, Gabbidon, Drake, and Rodriguez (under review).
Data Analysis

Descriptive statistics were used to describe the sample and performance on measures. Cronbach’s alpha was computed to determine the reliability of measures as reported above. Pearson’s $r$ was used to examine the bivariate relationship between variables. Logistic regression was used with HIV testing behavioral intent ($1=$yes or $0=$no) as the outcome variable and HIV knowledge, stigma, social support, subjective well-being, depression, anxiety, stress, and substance use as the predictor variables. Predictor variables were entered into the model in a single step in order to compare the variance in HIV testing behavioral intent for which each individual variable accounted. The three subscales of mental health, depression, anxiety and stress, were entered into the model in the first step. No other subscales were examined individually.
CHAPTER 4

Results

Participant Demographics

Participants in this study included 1161 youth aged 13 to 24 years ($M=16.57$, $SD=2.85$). The sample was primarily female (54.6%). Only 4% identified as gay or lesbian. The majority of participants identified their religion as Christianity (94.5%). Most said they were not sexually active (72.6%). A slight majority of the sample (56.0%) reported having been tested for HIV. The large majority (92.1%) said they were not HIV positive. See Table 1 for more detailed information about participant demographics.

Descriptive Statistics

Behavioral intentions. Of the 1049 participants who responded to this item, 64.4% reported that they planned to be tested for HIV, while 35.7% said they did not. Those who selected the third option, “I am HIV-positive” were not included in the analysis (see Table 2).

Brief HIV knowledge questionnaire (HIV KQ-18). Scores on this measure ranged from 2-18 with a mean score of 13.41 ($SD=2.64$), suggesting a moderate level of HIV knowledge among participants in this sample ($n=1159$). Some common incorrect items on this measure were “Coughing and sneezing DO NOT spread HIV” and “A person can get HIV by sharing a glass of water with someone who has HIV.” All participants answered the former incorrectly (see Table 2).
AIDS-related stigma scale (ARSS). Scores on the ARSS ranged from 0-9 with a mean score of 1.39 (SD= 1.30), indicating low levels of projected HIV stigma among participants, n= 1030 (see Table 2).

Social provision scale. Scores on this scale ranged from 12-60 with a mean score of 35.03 (SD= 6.95), indicating a low to moderate level of perceived social support among the sample (n= 854) (see Table 2).

Subjective well-being scale. Scores on this scale ranged from 1-10 with a mean score of 7.71 (SD= 2.66, n= 930) (see Table 2).

Depression, anxiety, and stress scale (DASS-21). This scale was divided into the three mental health subscales of depression, anxiety, and stress for more valuable interpretation. Depression scores within the sample (n= 811) ranged from 0-42 points with a mean of 7.67 (SD= 9.75); 56.4% of participants fell into what was considered the normal score range (Lovibond & Lovibond, 1995). Anxiety scores within the sample (n= 841) ranged from 0-42 points with a mean of 7.49 (SD= 9.48); 53.7% of participants fell into what was considered the normal score range. Stress scores within the sample (n= 850) ranged from 0-38 points with a mean of 7.97 (SD= 9.88); 66.5% of participants fell into what was considered the normal score range (see Table 2).

CRAFFT screening tool for adolescent substance abuse (CRAFFT). Participants (n= 1006) reported total scores that ranged from 0-6 with a mean score of 1.42 (SD=.83); 31.7% of participants scored two or higher (the recommended threshold for intervention) on this measure (Knight et al., 1999) (see Table 2).
Relationship between Variables

Pearson's $r$ was used to examine the bivariate relationship between variables. Findings revealed significant positive correlations between substance use and all three mental health subscales—depression, anxiety, and stress, $r= .12, p< .01$, $r= .14, p< .01$, and $r= .12, p< .01$, respectively. Substance use was also positively correlated with HIV knowledge, $r= .08, p< .05$. Additionally, positive correlations were found between projected stigma and all three mental health subscales—depression, anxiety, and stress, $r= .19, p< .01$, $r= .18, p< .01$, and $r= .14, p< .01$, respectively. There was also a positive correlation between projected stigma and social support, $r= .10, p< .01$.

Correlations also existed between all three of the mental health subscales. Depression was strongly correlated with anxiety and stress, $r= .87, p< .01$, and $r= .86, p< .01$, respectively. Additionally, anxiety was strongly correlated with stress, $r= .86, p< .01$. A final significant positive point-biserial correlation was found between HIV knowledge and the outcome variable of intent to be tested, $r_{pb}= .13, p< .01$.

Significant negative correlations were found between HIV knowledge and all three mental health subscales, depression, anxiety, and stress, $r= -.18, p< .01$, $r= -.19, p< .01$, and $r= -.16, p< .01$, respectively. HIV knowledge and projected stigma were also negatively correlated, $r= -.37, p< .01$, as were HIV knowledge and social support, $r= -.20, p< .01$. Subjective well-being was negatively correlated with social support, $r= -.08, p< .05$.

Two final significant negative point-biserial correlations existed. The outcome variable of intent to be tested for HIV negatively correlated with projected stigma, $r_{pb}= -.10, p< .01$, and social support, $r_{pb}= -.11, p< .01$ (see Table 3).
Impact of Variables on Intent to Test for HIV

A logistic regression was run with intent to be tested for HIV (1=yes or 0=no) as the outcome variable and HIV knowledge, stigma, social support, subjective well-being, depression, anxiety, stress, and substance use simultaneously included as the predictor variables. The logistic regression model was statistically significant, $\chi^2(8) = 16.12$, $p = .041$, and the model explained 5.9% (Nagelkerke $R^2$) of the variance in intent to be tested while predicting the outcomes of 65.9% of cases. HIV knowledge had a positive relationship with intent to test for HIV, $\chi^2 = 3.37$, $B = .10$, $p = .066$, $df = 1$. The odds ratio was 1.101 indicating that a one-unit increase in HIV knowledge increased intent to test by 10.1%. Social support was also identified as a significant negative predictor of intent to seek HIV testing with a negative odds ratio, $\chi^2 = 5.67$, $B = -.04$, $p = .017$, $df = 1$. When social support increased by one unit, the odds of HIV testing decreased by 3.6% (see Table 4).
CHAPTER 5
Discussion

Framed within the context of social cognitive theory (SCT), this study used existing data from the HIV SEERS Project, a community-based participatory research project designed to increase HIV knowledge and decrease HIV stigma, to examine facilitators and barriers to HIV testing among youth in Kenya. Understanding what might motivate or prevent youth in Kenya from seeking HIV testing is key in advancing effective education programs for this high-risk population.

Correlational findings revealed a significant relationship between HIV testing behavioral intentions and each of the following factors: knowledge, stigma, and social support. However, findings from the logistic regression model provided only partial support for the hypothesis that HIV knowledge, social support, subjective well-being and depression, anxiety, and stress symptoms would serve as facilitators to HIV testing, while HIV projected stigma and substance use would serve as barriers to HIV testing. Specifically, findings revealed that HIV knowledge (facilitator) and social support (barrier) were significant predictors of HIV testing. While the directionality of the relationship between testing intent and HIV knowledge was as predicted, surprisingly, social support emerged as having a negative relationship with testing intent. These findings are described further below.

Consistent with the existing literature, HIV knowledge was found to be a significant predictor of intent to be tested. In a meta-analysis of over 60 studies, Evangeli,
Pady, and Wroe (2016) found that HIV knowledge ranked among the most common factors selected by researchers when studying HIV testing behaviors, and that HIV knowledge was positively correlated with HIV testing.

The significant negative relationship between social support and intent to be tested for HIV found in this study is inconsistent with what is understood about the importance of social interaction in maintaining physical and mental health. Lypen, Lockwood, Shalabi, Harper and Ngugi (2015) studied type and source of social support among Kenyans aged 18-27. Their research indicated the important role of social support in populations with high risk of HIV in seeking testing and treatment. Additionally, they stress that many pathways of social support have not yet been explored in HIV intervention studies. Other studies also suggest social support is important for HIV testing, and conversely, that low levels of social support may serve as a barrier to testing among numerous populations of men who have sex with men (MSM) in the United Kingdom and United States (Boydell, Buston, & McDaid, 2017; Mashburn, Peterson, Bakerman, Miller & Cork, 2004). Social support also has been found to be an important factor in disclosing one’s status to others. In their meta-analysis of 21 studies on social support, HIV stigma, and disclosure, Smith, Rossetto, and Peterson (2008) found that disclosing one’s positive HIV diagnosis was positively correlated with having some form of social support. Cultural factors and stigma may help explain current findings. Given the stigma associated with HIV in Kenya, it is possible that fear of rejection by social groups may have served as a barrier to HIV testing for participants in this sample (Hamra, Ross, Orrs, & D’Agostino, 2006).
Several of the hypothesized facilitators and barriers to HIV testing were not found to be significant in the current study. First, although correlational findings revealed a significant relationship between stigma and HIV testing intentions, stigma did not predict HIV testing in the regression model. These results were surprising because the existing literature on HIV stigma suggests that many forms of stigma prevent protective behaviors that may reduce HIV transmission in addition to preventing HIV testing and linkage to care—even in the case of expectant mothers (Earnshaw & Chaudoir, 2009; Turan et al., 2011). These findings may be a function of the age of participants. Many studies of stigma to date have relied upon adult samples (Rueda et al., 2016; Thomas et al., 2005; Turan et al., 2017). It is possible that age interacts with these variables. For example, projected stigma was low in this sample of youth, which may reflect generational differences.

The fact that depression, anxiety, and stress did not predict HIV testing was surprising given the relationship between testing intentions and mental health in the literature. For example, Rueda et al. (2016) found that depression, anxiety, and stress were all contributing factors to risk-taking behaviors that may increase the need for HIV testing. These same mental health symptoms were present among a sample of individuals seeking HIV testing (Kagee, Saal, De Villiers, Sefatsa, & Bantjes, 2017). Also, those who were previously diagnosed with a mental illness were found more likely to have had prior HIV testing (Yehia et al., 2014).

Despite these findings within adults, depression, anxiety and stress may not be viewed by Kenyan youth in the same way they are among youth and adults in developed countries such as the United States and Canada. Social acceptability of admitting to
mental health concerns or even differing thresholds of tolerance may have had an impact on the significance of these factors in the current analysis.

Subjective well-being has not been extensively studied in relation to HIV testing. Thus, current findings neither confirm nor contradict previous research. Nonetheless, the use of a single-item measure may have affected current findings.

Substance use was not found to be a significant barrier to HIV testing. This finding is also inconsistent with the existing literature. Altice, Kamarulzaman, Soriano, Schechter, and Freidland (2010) reported that people who use drugs of any kind were less likely to seek HIV testing early on and, for this reason, were more likely to be diagnosed with advanced stages of HIV. Also among their findings were other important health indicators, such as increased risk of HIV exposure and suboptimal healthcare. Given the relationship between HIV testing and substance use, some current research works toward carrying out HIV testing at substance use treatment facilities (Simeone, Seal, & Savage, 2017).

Current findings provide some support for the use of Social Cognitive Theory to explain HIV testing behaviors among youth (Bandura, 1986). Specifically, social support—an environmental factor—and knowledge—a personal factor—were found to be significant predictors of HIV testing—a behavioral factor. However, several of the personal factors hypothesized for the model were not significant among the study sample as described above. Specifically, projected stigma, mental health symptoms, subjective well-being and substance use did not predict HIV testing in the current sample.
Limitations

There were several limitations to this study. First, while the measures used in this study were established as reliable measures within the literature, estimates of internal consistency among our sample were moderate for the social support and substance use measures and low for the HIV knowledge and projected stigma measures. One explanation for this relates to the homogeneity of the sample, since all participants were part of the same culture, and many fell within the same stage of development. In addition, there are other measure-related factors that can affect alphas—the length of the measures, use of subscales, interrelatedness, and construct heterogeneity (Tavakol & Dennick, 2011). Alphas should not be considered the only indicator of reliability, since low alphas do not always indicate poor measures, and high alphas are not necessarily proof of a reliable measure (Spiliotopoulou, 2009).

Second, cultural differences and language barriers may have been limitations in this study. While questionnaires were translated into Swahili (the native language in Kenya) and offered in both English and Swahili, all participants chose to complete the English version; this is likely due to the fact that English is taught and used in educational settings in the region (Roy-Campbell, 2015). Thus, youth might be more comfortable reading and writing in English while they are more comfortable speaking in their native language of Swahili (Roy-Campbell, 2015). Nonetheless, it is possible that individual items on measures were misinterpreted or misunderstood due to the cultural context.

Third, there was considerable missing data. The logistic regression was limited to participants \(n=340\) who completed all measures. This comprised only 29.29% of the total number of participants examined in this study \(n=1161\). It is possible that
differences existed between participants who completed all measures and those who did not, thus calling into question the validity of findings.

Conclusions and Future Directions

This research relied upon community-based participation, which is an inherently imperfect yet vital method of data collection. Despite the potential limitations of this study, all efforts were made to utilize only the most accurate measures to determine factors related to HIV testing intent. Although findings were not particularly robust, they provided some useful information about factors related to HIV testing intentions among youth in Kenya. There is still much to be learned about youth at risk for HIV in Kenya and the behavioral, personal and environmental factors that may impact their healthcare. This study serves as a building block for future studies.

Additional research is needed to explore factors affecting HIV testing among youth in low-to-middle income countries (LMICs). Post and follow-up data from the SEERs Project may yield important information about the impact of a community-based participatory research project on HIV testing and treatment. Beyond SEERs, it is imperative that further research include larger and more representative samples and take into consideration language and cultural barriers. Additionally, intervention studies designed to improve rates of HIV testing among youth in LMICs will build upon the information collected in this and similar studies.
References Cited


*Guidelines for HIV testing services in Kenya*. Nairobi: NASCOP.


Table 1

*Participant Demographics (N= 1161)*

<table>
<thead>
<tr>
<th>Age</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
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<td>18.3</td>
</tr>
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<td>17</td>
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<td>17</td>
<td>1.5</td>
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<td>Male</td>
<td>526</td>
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<table>
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<th>Do you identify as gay/lesbian?</th>
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<th>Percentage</th>
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</thead>
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<tr>
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<td>No</td>
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<table>
<thead>
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<tr>
<td>Islam</td>
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<td>Hinduism</td>
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</tr>
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<td>Buddhism</td>
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<td>0.6</td>
</tr>
<tr>
<td>Other</td>
<td>4</td>
<td>0.3</td>
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<td>No religion</td>
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<td>1.1</td>
</tr>
<tr>
<td>Wish not to answer</td>
<td>7</td>
<td>0.6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Have you ever been tested for HIV?</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>646</td>
<td>56.0</td>
</tr>
<tr>
<td>No</td>
<td>493</td>
<td>42.7</td>
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<td>Wish not to answer</td>
<td>15</td>
<td>1.3</td>
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<table>
<thead>
<tr>
<th>Do you have HIV?</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
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<tr>
<td>Yes</td>
<td>-</td>
<td>-</td>
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<tr>
<td>No</td>
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<td>Wish not to answer</td>
<td>92</td>
<td>7.9</td>
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<table>
<thead>
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<th>Are you sexually active?</th>
<th>Frequency</th>
<th>Percentage</th>
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<tbody>
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<td>Yes</td>
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<td>19.9</td>
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<tr>
<td>No</td>
<td>832</td>
<td>72.6</td>
</tr>
<tr>
<td>Wish not to answer</td>
<td>86</td>
<td>7.5</td>
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</table>

*Note: Participants who were previously diagnosed with HIV were excluded from analyses since this study focused on HIV testing intentions.*
Table 2

**Descriptive Statistics and Reliability of Measures**

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<thead>
<tr>
<th>Measure</th>
<th>n</th>
<th>%</th>
<th>M</th>
<th>SD</th>
<th>Range</th>
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<tr>
<td>HIV Testing Intentions</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>374</td>
<td>35.7</td>
<td></td>
<td></td>
<td>0-1</td>
</tr>
<tr>
<td>Yes</td>
<td>675</td>
<td>64.3</td>
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<td>HIV KQ-18</td>
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<td>13.410</td>
<td>2.635</td>
<td>2-18</td>
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<tr>
<td>AIDS-Related Stigma Scale</td>
<td>1030</td>
<td>1.390</td>
<td>1.302</td>
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</tr>
<tr>
<td>Social Provision Scale</td>
<td>854</td>
<td>35.026</td>
<td>6.949</td>
<td>12-60</td>
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<tr>
<td>Subjective Well-being</td>
<td>930</td>
<td>7.71</td>
<td>2.661</td>
<td>0-10</td>
<td></td>
</tr>
<tr>
<td>Depression (DASS-21)</td>
<td>811</td>
<td>7.672</td>
<td>9.754</td>
<td>0-42</td>
<td></td>
</tr>
<tr>
<td>Anxiety (DASS-21)</td>
<td>841</td>
<td>7.491</td>
<td>9.484</td>
<td>0-42</td>
<td></td>
</tr>
<tr>
<td>Stress (DASS-21)</td>
<td>850</td>
<td>7.972</td>
<td>9.879</td>
<td>0-38</td>
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</tr>
<tr>
<td>CRAFFT</td>
<td>1006</td>
<td>1.415</td>
<td>.831</td>
<td>0-6</td>
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</tr>
</tbody>
</table>

*Note:* For behavioral intentions, 1=yes and 0=no indicating whether or not the participant intended to seek HIV testing.
Table 3

Correlations and Descriptive Statistics of Variables

<table>
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<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
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</thead>
<tbody>
<tr>
<td>1. Behavioral intentions</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. HIV knowledge</td>
<td>.126**</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Projected stigma</td>
<td>.096**</td>
<td>.368**</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Social support</td>
<td>.111**</td>
<td>.196**</td>
<td>.104**</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Subjective well-being</td>
<td>-.017</td>
<td>.043</td>
<td>-.056</td>
<td>-.081*</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Depression</td>
<td>-.003</td>
<td>.179**</td>
<td>.191**</td>
<td>.000</td>
<td>-.020</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Anxiety</td>
<td>-.019</td>
<td>.194**</td>
<td>.183**</td>
<td>-.012</td>
<td>.000</td>
<td>.869**</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Stress</td>
<td>-.022</td>
<td>.162**</td>
<td>.143**</td>
<td>.006</td>
<td>-.025</td>
<td>.855**</td>
<td>.864**</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>9. Substance use</td>
<td>-.041</td>
<td>.023</td>
<td>.044</td>
<td>-.060</td>
<td>-.087*</td>
<td>.191**</td>
<td>.202**</td>
<td>.193**</td>
<td>-</td>
</tr>
</tbody>
</table>

Note: *p < .05. **p < .01. Point-biserial correlations were utilized when comparing the categorical outcome variable and any of the continuous predictor variables.
Table 4

Variables of the Logistic Regression Analysis (N=340)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Exp(B)</th>
<th>B</th>
<th>S.E.</th>
<th>$\chi^2$</th>
<th>df</th>
<th>p</th>
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</thead>
<tbody>
<tr>
<td>HIV knowledge</td>
<td>1.155</td>
<td>.144</td>
<td>.056</td>
<td>6.706</td>
<td>1</td>
<td>.010</td>
</tr>
<tr>
<td>Projected stigma</td>
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<td>-.077</td>
<td>.110</td>
<td>.487</td>
<td>1</td>
<td>.485</td>
</tr>
<tr>
<td>Social support</td>
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<td>-.042</td>
<td>.017</td>
<td>5.788</td>
<td>1</td>
<td>.016</td>
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<tr>
<td>Subjective well-being</td>
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<td>-.056</td>
<td>.051</td>
<td>1.249</td>
<td>1</td>
<td>.264</td>
</tr>
<tr>
<td>Depression</td>
<td>.963</td>
<td>-.037</td>
<td>.028</td>
<td>1.741</td>
<td>1</td>
<td>.187</td>
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<tr>
<td>Anxiety</td>
<td>.982</td>
<td>-.019</td>
<td>.033</td>
<td>.319</td>
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<td>.572</td>
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<tr>
<td>Stress</td>
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<td>.053</td>
<td>.034</td>
<td>2.446</td>
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<td>.118</td>
</tr>
<tr>
<td>Substance use</td>
<td>.649</td>
<td>-.433</td>
<td>.217</td>
<td>3.974</td>
<td>1</td>
<td>.046</td>
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</table>

*Note. S.E. = standard error. Exp(B) = odds ratio.*
Figure 1. Facilitators and Barriers to HIV Testing

<table>
<thead>
<tr>
<th>Facilitators</th>
<th>Barriers</th>
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</thead>
<tbody>
<tr>
<td>HIV Knowledge</td>
<td>HIV stigma</td>
</tr>
<tr>
<td>Social support</td>
<td>Substance use</td>
</tr>
<tr>
<td>Subjective well-being</td>
<td></td>
</tr>
<tr>
<td>Presence of depression, anxiety, stress</td>
<td></td>
</tr>
</tbody>
</table>

Note. Each variable listed in the center of the figure is placed on a continuum between acting as a facilitator or a barrier to HIV testing.
Figure 2. Social Cognitive Theory (SCT) Applied to HIV Testing

This figure visually demonstrates the application of SCT applied to HIV testing in this study, whereby the behavior (HIV testing) is influenced by both personal (HIV knowledge, HIV projected stigma, mental health, subjective well-being, substance use) and environmental (social support) factors. All factors should weigh evenly on one another as the model suggests.