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College Students' Knowledge of Human Immunodeficiency Virus and Willingness to Participate in Screening

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COLLEGE STUDENTS' KNOWLEDGE OF HUMAN IMMUNODEFICIENCY
VIRUS AND WILLINGNESS TO PARTICIPATE IN SCREENING

by

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Submitted in Partial Fulfillment of the Requirements for the
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Mississippi University for Women

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Graduate Committee Approval

The Graduate Committee of Alison Campbell, Aar'rin McDougal,
and Eritiki Morris

hereby approves this research project as meeting partial
fulfillment of the requirements for the Degree of
Master of Science in Nursing

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**COLLEGE STUDENTS' KNOWLEDGE OF HUMAN IMMUNODEFICIENCY
VIRUS AND WILLINGNESS TO PARTICIPATE IN SCREENING**

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Abstract

An estimated 1.2 million adults and adolescents are living with human immunodeficiency virus (HIV) in the United States and approximately 50,000 are newly infected each year. The Centers for Disease Control and Prevention (CDC) estimates that 44% of HIV-infected youth ages 18-24 are unaware of their HIV status. HIV destroys CD4 cells and leads to a severely weakened immune system, which increases the risk for infection and other infection-related cancers. If HIV is left untreated, the disease will eventually progress to acquired immunodeficiency syndrome (AIDS). HIV continues to be a concern in public health, yet the public perception about the severity of the HIV epidemic has declined in recent years. Although research suggests that college students are highly educated on modes of transmission for HIV, they continue to practice risky sexual behaviors that will increase their risk of HIV transmission. The researchers in this study utilized a descriptive, non-experimental, quantitative design to determine college students' knowledge regarding HIV and their willingness to be tested for HIV. The researchers used a modified version of the HIV-KQ-18 questionnaire. This questionnaire was passed out to students at the Campus Health Center. The questionnaire contained five

demographic questions regarding age, sex, gender, and race. In addition, the questionnaire contained 18 knowledge-based questions. Lastly, two questions were included regarding the history of HIV testing and willingness to test for HIV. The population surveyed were college students over the age of 18 who attended the Campus Health Center in the southeastern United States. A convenience sample was utilized to obtain a sample of 38 students. Data analysis revealed that college age students were not knowledgeable of HIV. The average score on the knowledge-based questions was 71.49%, which was below the benchmark of 72.2% set by the researchers. When evaluating self-reported practices of the sample population, only 28.9% percent reported having been tested for HIV in the past, but 92.1 % percent reported being willing to be tested for HIV. Findings revealed a great need for further education regarding HIV knowledge and HIV testing among college students in the southeastern United States.

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CHAPTER I

Dimension of the Problem

According to the Centers for Disease Control and Prevention (CDC), human immunodeficiency virus (HIV) is a virus that attacks the body's immune system, particularly the CD4 cells. CD4 cells, which are also known as T cells, help the body fight infections. HIV destroys CD4 cells and leads to a severely weakened immune system which increases the risk for infection and other infection-related cancers. If HIV is left untreated, the disease will eventually progress to acquired immunodeficiency syndrome (AIDS). There is currently no cure for HIV, but it can be effectively controlled with antiretroviral therapy (ART) (Centers for Disease Control & Prevention [CDC], 2019).

It is estimated that 1.2 million adults and adolescents are living with HIV in the United States and approximately 50,000 are newly infected each year. HIV infection has remained a serious public health concern in the United States, with individuals aged 13-24 years accounting for more than one in five new HIV diagnoses in 2014. The CDC estimates that 44% of HIV-infected youth ages 18-24 are unaware of their status. The decline in health care visits raise an issue in the health care community (Murray et al., 2018). HIV continues to be a concern in public health, yet the public perception about the severity of the HIV epidemic has declined in recent years. Although research suggests that college students are highly educated on modes of transmission for HIV, they continue to practice risky sexual behaviors that will increase their risk of HIV

transmission. This presents an issue to the public as well as health care providers (Dennison, Ickes, & Ickes, 2014).

The CDC recommends that all patients between the ages of 13-64 participate in a provider-initiated screening for HIV at least once in their lifetime. Previous studies by the National HIV Behavioral Surveillance (NHBS) have reflected that the percentage of heterosexual adults that have been HIV tested are increased in those that are at an increased risk for HIV acquisition. Other studies have proven that men report having more sexual partners than women; however, women are offered HIV testing more often than men. The results of these studies illustrate the importance of reaching all genders by ensuring that all providers initiate HIV test screening on all adults who are at an increased risk for HIV (Diespstra, Cunningham, Rhodes, Yerkes, & Buyu, 2018).

In 2010, 49% of individuals with an HIV diagnosis lived in the South. According to the CDC, the South had the lowest 3-year HIV survival rate in the United States. Southern states have been known to be disproportionately affected by obesity, poverty, and HIV (Reif et al., 2014). HIV is a problem in the southeastern region of the United States of America. Mississippi had a rate of 20.6 per 100,000 HIV diagnoses in 2015. Of the 13-24 age group diagnosed with HIV, 80% were within the 20-24 age population. There have been many HIV prevention efforts made to increase awareness and decrease new infection rates (Patev, Hood, Speed, Cartwright, & Kinman, 2019).

Statement of Problem

From 2002-2011, approximately 342,732 people had HIV/AIDS. The diagnosis was more common among males, those that were non-married, and poor income earners. Over the 10-year period, people living with HIV/AIDS had almost six times higher mean expenditure (\$26,893) when compared to people living without HIV/AIDS. Prescription medication expenses accounted for 66% of the total medical expenditure for those with HIV/AIDS. Relative to other expensive chronic conditions, HIV/AIDS was associated with 800-900% higher incremental expenditures. Ritchwood, Bishu, and Egede (2017) estimated the financial burden placed on the United States by people that are living with HIV/AIDS. HIV/AIDS costs the United States almost \$10.7 billion more for those living with HIV/AIDS than the costs for those living without HIV/AIDS during 2002-2011 (Ritchwood, Bishu, & Egede, 2017).

There are an estimated 1.1 million people who currently have HIV, with 1 in 7 not knowing they have it (CDC, 2019). The CDC recommends that everyone should get tested as part of the routine health screens at least once between the ages of 13 and 64. The people with higher risk should get tested more often than that. Fifty-five percent of adults that are between the ages of 18-64 have never been tested. Eighty percent of the new HIV transmissions were transmitted by people who did not know they had the infection. The rate of HIV infection in the state of Mississippi is continuing to rise at a time when treatment and prevention efforts have drastically improved (Mississippi State Department of Health [MSDH], 2016).

Statement of Purpose

The purpose of this study was to determine if college students were knowledgeable of HIV infection and transmission. The study was also utilized to determine the willingness of college students to participate in free HIV screening that was beginning at the university's Campus Health Center. The results of the study can be used by providers in the southeastern United States to provide the population with more effective health promotion related to HIV and HIV testing based on the knowledge level of the participants in the study. The benefits of having more effective health promotion in the southeastern United States will be to decrease the prevalence rate and increase people's knowledge level regarding HIV.

Significance to Research

According to the Joint United Nations Program on HIV/AIDS, approximately 36.9 million people globally were living with HIV, while another 1.2 million died from AIDS-related illnesses in 2014. Of those reported, more than 13% were unaware of their HIV status. In 2016, the World Health Organization (WHO) issued a directive to test and treat all who present with HIV infection regardless of their viral load (World Health Organization [WHO], 2017). Even though there are many challenges being faced in the war against the transmission of HIV, much improvement has been made over the last twenty years in the progress of HIV treatment. However, with the advancement in modern medicine and technology, the cost of treatment for HIV is significant (WHO,

2017). The information collected during this research could be used as a foundation to decrease the transmission of HIV.

Significance to Nursing

HIV is affecting some populations at a disproportionate rate. Krueger, Dietz, Van Handel, Belcher, and Johnson (2016) performed a quantitative study to determine which groups disproportionately affected by HIV infection are being reached and which groups are underserved by CDC funded HIV testing programs. The CDC supports state and local health departments and community-based organizations (CBOs) by providing funded HIV prevention activities, including HIV testing. An estimated 3.2 million CDC-funded tests were distributed in 2013 to health departments and organizations. Nationally, an estimated 47,165 people aged 13 years or older were diagnosed with HIV infection in 2013. In the same year, an estimated 15,695 people aged 13 years or older were newly diagnosed with HIV infection with a CDC-funded test (Krueger, Dietz, Van Handel, Belcher, & Johnson., 2016).

The study was conducted using HIV diagnoses data collected from the 2013 National HIV Surveillance System (NHSS) and the 2013 National HIV Prevention Program Monitoring and Evaluation (NHM&E) surveillance reports. Following the analysis, the researchers determined that the study partially supported their hypothesis. Among the people who received a CDC-funded test, 41.1% were aged 20-29 years, 22.9% were aged 30-39 years, 49.2% were male, 46.2% were black/African American, 21.4% were Hispanic/Latino, and 56.2% of the tests were conducted in the South. The

percentage of young adults and blacks/African Americans was the largest population affected by the HIV infection who was diagnosed using the CDC-funded tests. The Hispanic/Latinos and men who have sex with men (MSM) population were lower among those tested with a CDC-funded test than nationally. One fourth of the CDC-funded diagnoses for males were unknown, invalid, missing, or unclassified for transmission risk. This caused a gap among MSM nationally and those diagnoses made with CDC-funded tests. The NHSS also had a similar proportion of persons missing transmission risk information. In addition, the data may have been skewed due to the NHSS using a longer time frame to assess transmission risk factors than the NHM&E. The researchers concluded that the CDC-funded HIV testing programs should use strategies to increase HIV testing and diagnoses among MSM and Hispanic/Latinos (Krueger et al., 2016). The nursing community must step forward to help fill the HIV education gap in regard to reaching MSM and the Hispanic/Latino community.

The data collected in this research study is essential to nursing in the southeastern United States. Nursing is a continuously evolving discipline based on evidence-based practices. The nursing community will be able to utilize the results of the research to educate patients more effectively based on common misconceptions that were noted from participants' responses on the questionnaire. The results from the questionnaire also reminds nurses to not assume that college age students are aware of common HIV facts.

Significance to Education

HIV prevention education among college students is a necessity. The HIV knowledge gap, stigma, and risk factors are exceptionally high among college students (Kingori, Nkansah, Haile, Darlington, & Basta, 2017). With the recent increase in HIV diagnoses, this study will help health care providers and CBOs to educate patients. This study will assist in enhancing the awareness of the rise in HIV infections in the southeastern United States. Furthermore, this study will be useful in improving the awareness of educational needs and preventing new HIV infections.

Theoretical Framework

The Health Promotion Model by Nola Pender describes health as a positive state and not just the absence of disease. Health promotion is directed toward increasing an individual's overall well-being. The Health Promotion Model focuses on the many aspects of a person and how they interact within their environment to pursue their health. The desired behavioral outcome of the Health Promotion Model is the individual displaying health promoting behaviors (Alligood, 2018).

The Health Promotion Model Theory is important because health promoting behaviors should result in overall improved health, enhanced functional ability, and better quality of life for the individual. The Health Promotion Model focuses on three areas: individual characteristics and experience, behavior-specific cognitions and affect, and behavioral outcomes. Martha Alligood (2018) addressed several major concepts found in the Health Promotion Model. A few of the concepts discussed were prior related

behavior, personal sociocultural factors, perceived benefits of action, situational influences, and health-promoting behaviors (Allgood, 2018). Prior related behavior refers to the frequency of the same behavior. This has direct and indirect effects of the likelihood of engaging in health promoting behaviors. Personal sociocultural factors include race, ethnicity, education, and socioeconomic status. Perceived benefits of action are anticipated positive outcomes that result from health behavior. Situational influences are personal perceptions of any given situation that can impede behavior. Health promoting behavior is an outcome that is directed toward attaining optimal well-being (Allgood, 2018). Some examples of health-promoting behavior include eating a healthy diet, managing stress, using protective barriers when engaging in sexual activity, and obtaining education regarding sexually transmitted diseases.

In 1990 Nola Pender wrote an article entitled “Expressing Health Through Lifestyle Patterns”. In it, Pender explained how the concept of health promoting behaviors had gained much attention from health professionals and the public during the previous decade. She hypothesized that the reason for the increase in attention was due in part to the emergence of disease prevention and health promotion as priorities worldwide. She further explained in the article that the nature of health as a positive life process is very poorly understood. She wrote the article to bring awareness of health promoting behaviors, to propose a new system for classifying expressions of health of persons in their entirety, and to suggest related indicators of high-level health (Pender, 1990).

The Health Promotion Model by Nola Pender can be used in many aspects of nursing and research. The researchers utilized the Health Promotion Model to assess health-promoting behaviors in college students. The theory was also used to obtain students' prior related behavior, situational influences, and perceived benefits of actions. The researchers administered questionnaires to willing college students on campus. In doing so, students confidentially answered many questions related to perceptual behaviors. They also had the opportunity to answer whether they would be willing to partake in a health promotion behavioral activity. Many people infected with HIV do not know that they have this virus. The vicious cycle continues when they partake in unhealthy behaviors and pass the virus around unknowingly. With the advances in technology, sexually active college students are given an opportunity to ascertain if they have been infected with the HIV virus. Knowing their HIV status is a health promoting behavior. The researchers anticipate bringing awareness to the southeastern United States that is so highly affected by the current HIV epidemic.

Research Questions

The following research questions were the focus of this study:

1. Are college students knowledgeable regarding HIV infection and transmission?
2. Is there a correlation between HIV knowledge and willingness to participate in free HIV screening?

Definition of Terms

For this study, there were several terms that needed to be defined as they apply to the study. The theoretical and operational definitions follow, respectively:

College students.

Theoretical: One who attends an institution offering instruction usually in a professional, vocational, or technical field (College, 2020; Student, 2020).

Operational: Individuals who are at least 18 years of age and currently enrolled in a rural university in the southeastern United States.

Knowledgeable.

Theoretical: The range of one's information or understanding (Knowledgeable, 2020).

Operational: The HIV-KQ-18 questionnaire contained eighteen knowledge-based questions. The questionnaire was analyzed by giving a numerical score to correct/incorrect responses provided by the participants. A score of 13 out of 18 (72.2%) was considered knowledgeable. A score below a 13 out of 18 (72.2%) was considered unknowledgeable.

Human Immunodeficiency Virus (HIV) Infection and Transmission.

Theoretical: The human immunodeficiency virus (HIV) infects cells of the immune system, destroying or impairing their function. Infection with the virus results in progressive deterioration of the immune system, leading to "immune deficiency" (WHO, 2017).

Operational: A virus that can be transmitted via blood or sexual contact that attacks and destroys the immune system.

Screening.

Theoretical: To test or examine for the presence of something such as a disease (Screening, 2020).

Operational: A rapid HIV test offered free of charge to all students enrolled in the small university and administered by the Campus Health Center.

Willingness.

Theoretical: (a) Inclined or favorably disposed in mind; (b) Prompt to act or respond (Willingness, 2020).

Operational: Students' readiness to participate in a rapid HIV test offered at the Campus Health Center.

Assumptions

For the purpose of this study, the following assumptions were made:

1. The researchers assume the college students will answer the questionnaire truthfully and honestly.
2. The researchers assume the questionnaire will provide an insight regarding college students' knowledge about HIV.
3. The researchers assume college students will be willing to participate in free HIV testing as a health promoting behavior (Alligood, 2008).

CHAPTER II

Literature Review

The review of literature was performed to determine the knowledge of college students regarding human immunodeficiency virus (HIV) and HIV testing, as well as college students' attitudes towards HIV testing on college campuses. This following review of literature will discuss important topics, such as the conceptual frameworks related to Nola Pender's Health Promotion Model and a review of related literature. The review of literature is divided into risk factors for HIV, HIV stigma, HIV testing, and attitudes toward HIV.

Risk Factors

Dennison, Ickes, & Ickes (2014) performed a quantitative study to identify the prevalence of HIV testing in a sample of college students and explore the associated demographic and behavioral characteristics. HIV continues to be a concern in public health, yet the public perception about the severity of the HIV epidemic has declined in recent years. It is estimated that 1.2 million adults and adolescents are living with HIV in the United States, and approximately 50,000 are newly infected each year. Although research suggests that college students are highly educated on modes of transmission for HIV, they continue to practice risky sexual behaviors that will increase their risk of HIV transmission. This presents an issue to the public as well as health care providers (Dennison, Ickes, & Ickes, 2014).

In this study, no hypothesis or research questions were clearly stated. The purpose the researchers sought to achieve was to summarize the prevalence of HIV testing in a sample of college students and to examine associated demographic and behavioral characteristics. The study was conducted at a large southeastern university. The university randomly selected 7,183 students ages 18 or older from a population of approximately 28,000 students to complete an online general health behavior survey. Out of the sample size, a total of 1,103 students completed the survey. It took the participants 15-20 minutes to complete the survey. The ACHA-NCHA was the instrument used in this study as a framework for question development (Dennison et al., 2014).

The researchers summarized the statistical findings of the study into a table chart. The relationship between HIV testing and demographic characteristics revealed that more than one-third of the college students (n=328; 36.2%) reported ever having been tested for HIV. Females were 1.4 times more likely than males to get tested for HIV. Age was a significant factor because the mean age of students who had been tested were older students. Relationship statuses ($p < .0001$) were associated with HIV testing. Students who were in a committed relationship, married, separated, divorced, or living with their spouse reported having higher testing rates (n= 167; 42%) than students who had never been married, less committed or single. Heterosexuals were 32% more likely to have been tested than homosexuals/bisexuals (AOR=0.32, 95% CI [0.19, 0.51]). Sexual behavior questions were asked to examine the relationship between HIV testing and sexual behaviors. The results of the questions revealed that safer sex behaviors while

engaged in anal sexual activity did lead to increased rates of testing. Consistent condom usage while engaging in vaginal sex activity was not, however, associated with increased HIV testing. The researchers identified recommendations for future research. The first recommendation stated that future researchers should investigate the perceptions of HIV testing among both heterosexual and homosexual/bisexual students on college campuses. The second recommendation was to understand the likelihood of college students seeking HIV testing. In addition, college students should be educated on overall sexual health promotion (Dennison et al., 2014).

Dennison et al. (2014) identified several weaknesses in the study. The overall sample size was large, but the response rate was only 15%. Participants were recruited from one university instead of several schools. Another limitation was the university's demographic was largely white and heterosexual. Finally, a large percentage of the sample were graduate level students, older than previous studies of undergraduate level students. As a result, this made it difficult to generalize the large sample size. Regardless of the relatively small response rate, this study captured a correlation of demographic and behavioral characteristics in a high-risk group. The researchers recommended future studies to be conducted on diverse college campuses and to investigate associated factors that influence the students being tested for HIV (Dennison et al., 2014).

The study is relevant to the current study because it provides a strong foundation for the current research. The study was conducted on a college campus, which is similar to where the current research will take place. One research question was addressed in the

former study, which could be used to compare outcomes. The previous researchers suggested that educating college students on overall sexual health promotion should be included in HIV-testing. The current researchers will determine the knowledge of college students in Mississippi regarding HIV and HIV testing and will utilize Nola Pender's Health Promotion Model as a guide for the proposed study (Dennison et al., 2014).

Stigma

Kingori, Nkansah, Haile, Darlington, and Basta (2017) performed a pilot cross-sectional study for the purpose of exploring factors associated with HIV related stigma in relation to adequate access to information and HIV knowledge, and to show gaps in HIV prevention strategies. According to the Joint United Nations Program on HIV and acquired immunodeficiency syndrome (AIDS), approximately 36.9 million people globally were living with HIV, while another 1.2 million died from AIDS-related illnesses in 2014. Of those reported, more than 13% were unaware of their HIV status. In 2016, the World Health Organization (WHO) issued a directive to test and treat all who present with HIV infection regardless of their viral load (WHO, 2017). Even though there are many challenges being faced in the war against the transmission of HIV, much improvement has been made over the last twenty years in the progress of HIV treatment. However, with the advancement in modern medicine and technology, the cost of treatment for HIV is significant. HIV prevention education among college students is a necessity. The HIV knowledge gap, stigma, and risk factors are exceptionally high

among college students. No theoretical framework was identified in this study (Kingori, Nkansah, Haile, Darlington, & Basta, 2017).

The main purposes the researchers sought to achieve were directed toward HIV related stigma amongst college students in relation to adequate access of information, the level of HIV knowledge, and to show the gaps in HIV prevention strategies. No hypotheses were stated.

This pilot study was conducted using a small sample of college students from a school in the Midwest. Undergraduates and graduates were able to fill out the survey during class. The professor allowed the last 15 minutes of class for those who wanted to voluntarily fill out the survey. Those who chose not to participate were allowed to leave class. The researchers also were able to get more participants in high traffic areas around campus. Those that read the consent and were willing to participate were directed to a private area to fill out the survey. Those that completed the survey were given a \$5.00 gift card for participation in the study. To be eligible to participate in the study, the participants had to be 18 years or older and currently be registered at the university. Since only four participants were graduate students, those results were excluded from the analysis. The researchers were able to analyze a sample size of 200 undergraduate students. The HIV Knowledge Questionnaire (HIV-KQ-18) knowledge instrument was adapted and used to quantify knowledge of HIV. The researchers used a 14-item HIV stigma instrument to measure feelings and attitudes towards interactions with people

living with HIV. A 7-point scale was used to measure responses regarding access to HIV information in the past 30 days (Kingori et al., 2017).

Following analysis, the researchers determined that the participants ranged in age from 19-31 years old. Seventy-seven percent of the participants were female, and 88 percent of the participants were non-Hispanic white. HIV stigma scores were higher for males than females. The researchers discovered that HIV knowledge scores were higher for students not living in a dorm. Only four percent of the participants answered correctly for all HIV knowledge questions. Compared to males, females had a lower HIV stigma. The researchers interpreted that peer educator interventions and an increase in HIV testing could help boost prevention in this area. The researchers found that nearly seventy percent of the sample falsely believed that they could get tested for HIV one week after a sexual encounter and get accurate results. The researchers believed that working with campus health to distribute pamphlets or other educational material would prove to close the gap. Also, nearly 60% of the sample falsely answered that natural latex condoms were more effective against HIV transmission than latex condoms. Nearly half of the sample size falsely answered that all pregnant women affected with HIV would deliver infected newborns. The researchers suggest closing this knowledge gap by providing more education (Kingori et al., 2017).

The researchers identified several weaknesses in this study. The population at the school was over 40,000. Yet, the researchers were only able to obtain 200 participants. Such a small study cannot be generalized to larger populations. Another limitation to this

study included that the data collected were self-reported. There is no way to measure a person's honesty. Graduate students were excluded due to only four participants. Finally, the researchers only collected data in a few classrooms and within one high traffic area. The researchers recommended that future studies take this pilot study and expand upon it further. The article was titled appropriately in that the reader's expectations would be ascertained (Kingori et al., 2017).

The study is very relevant to the current study for several reasons. The researchers were seeking answers to the factors associated with the HIV related stigma in relation to adequate access to information and HIV knowledge. The current researchers will seek to answer the knowledge gap that exists between HIV testing and campus communities. Because college students partake in high risk behaviors, there is a need to assess HIV knowledge and other factors related to HIV stigma. The information gathered in this study can help develop educational opportunities that are lacking in colleges and universities (Kingori et al., 2017).

James and Ryan (2018) performed a cross-sectional data study for the purpose of determining the influence of HIV knowledge on the relationship between HIV testing history and stigma in college students. HIV is a significant health problem in the United States, and it can have detrimental or even deadly health effects on those knowingly and unknowingly living with this disease. Over 1.1 million people in the United States living with HIV are over 13 years old. Half of this age group were college age students. This age group is also at increased risk for sexually transmitted diseases. This presents as a

very important issue to community health care providers. Promoting healthier lifestyle behaviors at an early age will decrease the number of HIV and STI infections. The social-ecological model was used as a guide during this study (James & Ryan, 2018).

The researchers hypothesized that when controlling for major of study, psychodemographic, and behavioral variables, HIV knowledge mediates the relationship between HIV testing history and stigma in college students. A second focus of this study was to assess differences in HIV knowledge and stigma among majors of study (James & Ryan, 2018).

The study was conducted in a web-based survey through Qualtrics Survey Management to a random sample of 10,000 undergraduate and graduate students over the age of 18. Students were invited through email to participate in the survey. The students were given two weeks to answer the survey. The first, middle, and last 10 participants received a \$20 gift card. The survey link was opened by 3,162 students. Only 23% of those invited completed the survey fully (James & Ryan, 2018).

Demographic data and a patient health interview were collected. HIV related stigma, HIV transmission and treatment knowledge, testing history and sexual behaviors, and sample demographic data were measured. HIV stigma was measured using the Scale of Stigmatizing Attitudes Towards People Living with HIV (SAT-PLWHA-S). Higher scores indicated more agreeable attitudes toward HIV and people living with HIV. Knowledge was measured using the HIV-KQ-18. A higher score received indicated

higher knowledge of the subject. Sexual behavior items were derived from the National College Health Assessment II (James & Ryan, 2018).

Following analysis, the researchers determined that a total of 2343 students were included in the data analysis. The age of the respondents ranged from 18 to 58 years old, with an average of 21.75 years old. A majority of the respondents were white (72%), female (63%), and straight (87%). One-third (34%) of those sampled had received an HIV test in their life. Total HIV knowledge was high. Results support the relationship hypothesis that HIV testing was a large predictor of HIV knowledge and HIV knowledge was a significant predictor of stigma. The researchers found that knowledge partially mediated the relationship between HIV testing history and stigma in college students: having had an HIV test was associated with higher levels of knowledge that, in turn, were associated with more agreeable attitudes (i.e., less stigma) (James & Ryan, 2018).

The findings of this study have important implications for future practice and research. The study found that HIV related stigma impacts testing and adherence to treatment. Increasing the number of people who have less stigma will help normalize the environment. Second, adding an educational component to HIV testing sessions may increase prevention behaviors. College health promotion specialists could use this information to tailor educational needs on campus (James & Ryan, 2018).

One weakness of the study included the omission of identifying the type of HIV test in which the student engaged. This left the researchers unable to compare the relationships between HIV testing with education, versus HIV testing without education.

The surveys conducted were thorough and were a positive aspect of this study. The measures studied were commendable (James & Ryan, 2018).

This study is very relevant to the current study for many reasons. The foundation of this study is HIV knowledge mediates the relationship between HIV testing history and stigma among college age students. This is similar to the topic on which current researchers collected data. The data collected during this study will pioneer future research topics. The current researchers seek to answer the knowledge gap that exists between HIV testing and campus communities (James & Ryan, 2018).

Attitude

Patev, Hood, Speed, Cartwright, and Kinman (2019) performed two survey studies using four samples at different times. Samples consisted of undergraduate students at a large southeastern university for the purpose of determining whether conspiracy beliefs partake in a link between HIV testing attitudes and HIV contraction prevention ability. HIV is a problem in the southeastern region of the United States. Mississippi had a rate of 20.6 per 100,000 HIV diagnoses in 2015. Of the 13-24 age group diagnosed with HIV, 80% were within the 20-24 age population. There have been many HIV prevention efforts made to increase awareness and decrease new infection rates. This study discussed the HIV testing attitudes and conspiracy theory beliefs and liken them to the perceived ability to prevent HIV to determine if there is a link between the two. The issue described is not a new issue, as the authors use the Tuskegee Syphilis Study as an example of how a mistrust of the medical community by African Americans

began. These injustices led to a conspiracy theory belief that increased the distrust of the medical community today. Bandura's Social Cognitive Theory (SCT) was used in this study to evaluate if preventive behaviors were influenced by cognitive, behavioral, and environmental factors that may result in HIV conspiracy theory beliefs (Patev, Hood, Speed, Cartwright, & Kinman, 2019).

Patev, et al. (2019) identified three hypotheses. The first hypothesis stated that less ability to prevent HIV is perceived by individuals who hold more negative HIV testing attitudes. The second hypothesis stated that less ability to prevent HIV is perceived by individuals who hold more conspiracy theory beliefs. The third hypothesis stated that the link between the perceived ability to prevent HIV contraction and HIV testing attitudes is driven by beliefs in HIV/AIDS conspiracy theories, either at least or in part (Patev et al., 2019).

The Patev et al. (2019) study consisted of two surveys using four samples, on a large southeastern university campus. The participants were recruited by an online research website called SONA- Systems that was set up by the Department of Psychology at this university. Each sample was conducted over the following semesters: Fall 2013, Spring 2014, Fall 2014, and Spring 2015. The sample collected in Fall 2013 had 373 undergraduate students. The sample collected in Spring 2014 had 231 undergraduate students. The sample collected Fall 2014 had 345 undergraduate students. The sample collected Spring 2015 had 369 undergraduate students. Data were gathered through a survey using the website Qualtrics (Patev et al., 2019).

Demographic data, the reporting of ever having had an STI, and having been tested for HIV in the last year or month were collected during each survey. The HIV Attitudes Scale and HIV/AIDS Conspiracy Theory Scale were included in the questionnaire. The HIV Attitudes Scale was used to question attitudes towards HIV tests in general, and attitudes towards those who get tested. The HIV/AIDS Conspiracy Theory Scale evaluated conspiracy theory beliefs that participants held. Higher scores on this scale indicate an individual held a greater belief in HIV/AIDS conspiracy theories (Patev et al., 2019).

Following analysis, the researchers determined the first hypothesis in all the studies was not statistically supported. The findings from both studies suggested that individuals that had negative attitudes toward HIV testing felt that they could prevent STIs. There was an increase in HIV attitude scores resulting in the likelihood that participants can do “almost nothing” to prevent HIV. The first hypothesis was therefore rejected, and the null hypothesis was accepted. The second hypothesis was statistically supported in both studies ($p=.01$; $b=1.52$; $OR=4.55$, 95% $CI=1.044, 14.33$). The results of both studies suggest that those who had conspiracy theory beliefs were more likely to feel that they could do little to prevent the contraction of HIV. Therefore, this hypothesis was accepted. The third hypothesis was statistically supported in both studies ($p=.03$; $b=-0.04$). The results of both studies suggested that there was a link mediated by the HIV conspiracy theory beliefs between HIV prevention self-efficacy and HIV attitudes. Therefore, this hypothesis was accepted. The researchers concluded that conspiracy

theory beliefs can have a substantial impact on the prevention self-efficacy of HIV and STIs (Patev et al., 2019).

Patev, et al. (2019) identified several weaknesses in this study. First, prevention self-efficacy and the outcome variable was one component. This decreased the ability to determine the participant's holistic perception of prevention self-efficacy of HIV contraction. Another limitation was the limited range of responses hindered a fine look at perception of HIV ability of prevention. The researchers only selected participants that needed a psychology course credit. This limited the number of participants to only those within that category. Finally, the participants included non-sexually active and sexually active participants. The range of non-sexually active participants varied up to 57%; therefore, some participants would not need to be tested for HIV. The recommendations include an increase in the range of questions to determine different perspectives. Another recommendation would be to include the entire student body at the university to gain a more accurate statistic of the university campus perception of HIV (Patev et al., 2019).

The Patev, et al. (2019) study was beneficial in determining the attitudes of HIV testing. This was helpful to the current study. However, the lack of inclusion of the entire student body decreases accurate statistics needed for the current study. The current researchers seek to answer some of the recommendations for future research in determining HIV knowledge and testing among the college campus setting (Patev et al., 2019).

St. Lawrence et al. (2015) performed a study among racial minority males who have sex with other males to examine their personal views concerning HIV testing. In three United States cities in-depth interviews with knowledgeable individuals in the community, as well as 100 African American males who have sex with other males were conducted. The broad significance of this study is the potential effectiveness of early detection and treatment of HIV in preventing the spread of the HIV/AIDS epidemic. Antiretroviral treatments not only reduce illnesses in the infected individual, but suppression of the viral load significantly lowers transmission from that person to their partner. Therefore, early treatment is beneficial both for the individual and for meeting the objectives of the community as a whole. The Centers for Disease Control and Prevention (CDC) cites information that most HIV infections among men in the United States are attributed to male to male sexual activity, and racial minorities comprise the majority of this percentage (St. Lawrence et al., 2015).

St. Lawrence et al. (2015) did not state a prior hypothesis in this study, but instead explored the beliefs and attitudes of African American men who have sex with men about voluntary counseling and HIV testing. Increasing the willingness of this group of the population is potentially linked to the success in limiting the spread of HIV and its stigma. Related goals of the study include identification of availability, the individual views about testing and treatment, and their behavior changes after testing (St. Lawrence et al., 2015).

Those interviewed were asked about many social and behavioral issues by African American staff members who had received previous interview training. Each interview lasted from 40 to 90 minutes. Those individuals who were known to be seropositive were asked in-depth questions about how that status had affected their lives. All interviews were transcribed and evaluated by investigators from the three cities where the study was held. The three cities where the study was conducted were Milwaukee, WI, Cleveland, OH, and Miami, FL, and sampling was purposive in that informants from the African American males who were having sex with other males were chosen for the interviews. All participants signed waivers and were paid eighty dollars for participating in the study. The interviews for this study were conducted from February through November 2011, were transcribed, and coded according to a coding tree developed by the investigators (St. Lawrence et al., 2015).

Important attitudes made evident in the results are that most African American males who are having sex with other males do not want to know their HIV status and generally avoid healthcare. Condom use is rare in the African American community and is based on what is expected in the social setting rather than a decision based upon their health. Those who were tested for HIV frequently did not return to get the results of the test, and those who tested positive frequently did not engage in treatment programs. There were strong emotional reactions to the testing process, and those who tested positive described very negative outcomes in their personal lives including losing their jobs, partners, and experienced perceived discrimination based on them being

seropositive. Further research should include the development of strategies to encourage HIV testing among black males with the objective of initiating further treatment (St. Lawrence et al., 2015).

The study may have shown significant differences had it been carried out in cities that already had established testing programs for minority men. The results could have been skewed based on the sampling techniques because they were not representative of the entire African American community. The researchers did confirm African American males' fears of not only being tested but being diagnosed with HIV; therefore, the importance of reaching this group so that early entrance into treatment programs is feasible or likely (St. Lawrence et al., 2015).

The applicability of this study in the current research confirms that African American men were relatively unaware of the benefits of HIV testing and early treatment programs. The men were also fearful not only of the testing but of the possibility of being diagnosed with HIV. Many were also hesitant to be tested due to the fear of discrimination. Many men felt that being diagnosed with HIV would cause them to be labeled and discriminated against in the future (St. Lawrence et al., 2015).

HIV Testing

Murray et al. (2018) performed a qualitative study for the purpose of identifying key elements for optimal community-based testing, linkage to care, and to inform HIV individuals' preventable interventions. HIV infection has remained a serious public health concern in the United States, with individuals ages 13-24 years accounting for

more than one in five new HIV diagnoses in 2014. The CDC estimates that 44% of HIV-infected youth ages 18-24 are unaware of their status. Georgia's HIV continuum of care analyses during 2013 revealed that 82% of adolescents and adults living with HIV knew their diagnosis, and 75% were linked to care. In 2014, only 60% of people living in Georgia with HIV had at least one HIV care visit and 48% were retained in care. The decline in care visits raised an issue in the health care community. The significance of this study was to identify misconceptions of HIV, increase HIV screening of at-risk youths, and to increase successful HIV treatments for HIV infected people. A theoretical framework was not identified in the study (Murray et al., 2018).

Murray et al. (2018) sought to understand the barriers for HIV testing among the youth. In order to do that, the authors proposed two research questions in the study. One question was to understand what youths consider to be important factors for community-based testing. The second question was to determine from HIV positive youth what they felt was important to learn from health care providers to strengthen linkage to care (Murray et al., 2018).

The study was conducted in the Atlanta Metropolitan Statistical Area (MSA). Researchers recruited youth through various outreach activities. There were 17 qualitative focus groups with HIV positive and negative youths, ages 18-24 years. Of the 68 participants, 85% were male, 90% were African American, 68% were HIV positive, and 50% had high school education or less. After receiving informed consent, the participants completed Audio Computer-Assisted Self-Interviewing surveys and

participated in focus group sessions. The focus group discussion guide identified target venues for HIV testing, strategies for approaching at-risk youth for testing, barriers to testing, reasons for delaying entry to HIV care if applicable, opinions on testing methodologies and social aspects of the HIV epidemic. The discussions lasted 90-120 minutes and were audio recorded. There were three members of the research team who led the focus group. One team member was the interviewer, the second team member transcribed the audio recordings and the third member reviewed the transcripts. Two qualitative data analysis reviewers read each transcript and applied structural codes to the data (Murray et al., 2018).

Murray et al. (2018) identified three recommendations from the participants when approaching someone about HIV testing. The first recommendation stated the importance of being discreet when approaching someone in the community about HIV testing. The second recommendation stated that being candid about testing is a favorable approach. Lastly, offering incentives could motivate people to get tested in the community. After receiving a positive HIV test result, the participants thought it was important for providers to offer emotional support and reassurance of a healthy life span (Murray et al., 2018).

Murray et al. (2018) identified three major limitations of the study. First, the sample may have skewed results because the youths who participated were in favor of community-based testing. It is possible that the youth who declined to participate could have other beliefs or recommendations around HIV testing that are not reflected in the

study. Second, the youth were from one particular area and the findings are not generalized to other areas. The third limitation was a majority of the youth in the sample were young black men who have sex with men. Although the study presented with a few limitations, it gave insight and recommendations from HIV-positive and negative individuals. The researchers recommended future studies to include individuals with different genders, races/ethnicities, and sexual orientations. They further recommended that future studies should engage youth from diverse settings, including rural, urban, and outside of the southeastern United States (Murray et al., 2018).

The study is pertinent to the current study for various reasons. The foundation of the study focuses on community-based HIV testing which is like the current study. The previous researchers suggested future studies to include individuals with different genders, races/ethnicities and sexual orientations. The current research will use the recommendation for the current study (Murray et al., 2018).

Milligan, Cuneo, Rutstein, and Hicks (2014) performed a non-experimental study to increase access to HIV prevention services, counseling, and testing. HIV counseling and testing is promoted by the CDC in non-traditional environments like college campuses. There were almost 16,000 deaths among those diagnosed with HIV in 2016. Of the 16,000, 47% was in the South. Fifty-one percent of people between the ages of 13-24 did not know they were infected with HIV. Although there is a decline in HIV infections, HIV prevention and treatment are not reaching rural areas. This study shows the importance of offering HIV testing, counseling, and prevention services by primary

health care providers. The study determines that increasing access to HIV testing, counseling, and prevention services on private university and community college campuses will increase awareness of HIV statistics in college students. The Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) was relied on for the model evaluation for this study (Milligan, Cuneo, Rutstein, & Hicks, 2014).

Milligan et al. (2014) did not propose any specific hypothesis. Although there is a lack of a hypothesis, the purpose of the study is clearly identified. The study was designed to investigate whether an HIV testing program within a college setting could be sustained. The problem statement identified that 50% of people with undiagnosed HIV are between the ages of 13-24, and the U.S. Preventive Services Task Force recommends screening people that are between the ages of 13-65 for HIV infection (Milligan et al., 2014).

The Milligan et al. (2014) study was conducted on a private university campus and a community college campus. The private university was the campus that ran the program called “Know Your Status” (KYS). They served as HIV testing counselors and program administrators. The community college campus helped develop the program. The community college campus also did on-campus advertising. HIV testing was done weekly with special testing events held during health fairs. The study results were recorded from over a three-year period between October 2006 to December 2009 (Milligan et al., 2014).

Milligan et al. (2014) collected demographic data at the institutions from both the questionnaire and actual HIV test. Testing was done in a confidential matter to provide counseling during that time. There were 1,000 private university students and 408 community college students tested and surveyed. HIV testing was done using the OraQuick Advance Rapid HIV-1/2 Antibody Test. Demographic data included age, race, prior HIV testing history, sex, and risk behaviors or perceptions. The survey was voluntary and anonymous. It included questions that asked about risk behaviors, perceptions of risk, testing history, demographic information, and the reasons for HIV testing (Milligan et al., 2014).

Milligan, et al. (2014) identified weaknesses in this study. First, the questionnaire's accuracy is uncertain due to the data being self-reported. Second, repeated testing may have been included in the testing. Repeated testing would cause bias in the overall data results for riskier behavior for the student body as a whole. Finally, only those who followed through with HIV testing had their data collected. It is assumed that if a student had a greater risk behavior, they would be more likely to be re-tested (Milligan et al., 2014).

The basis of the study was to determine the sustainability of an HIV testing center within a college campus. The researchers suggest that the KYS program is successful and can be replicated on other campuses. It is believed that the testing and screening measures of this study can be utilized in further research to determine the efficacy of HIV testing within a college campus community (Milligan et al., 2014).

Krueger, Dietz, Van Handel, Belcher, and Johnson (2016) performed a quantitative study to determine which groups disproportionately affected by HIV infection are being reached, and which groups are underserved by CDC funded HIV testing programs. The CDC supports state and local health department community-based organizations (CBOs) by providing funded HIV prevention activities, including HIV testing. An estimated 3.2 million CDC-funded tests were distributed in 2013 to health departments and organizations. Nationally, an estimated 47,165 people aged 13 years or older were diagnosed with HIV infection in 2013. In the same year, an estimated 15,695 people aged 13 years or older were newly diagnosed with HIV infection with a CDC-funded test. A theoretical framework for the study was not identified (Krueger, Dietz, Van Handel, Belcher, & Johnson, 2016).

In this study, Krueger, et al. (2016) hypothesized that persons newly diagnose with HIV infection in 2013 by a CDC-funded test were more likely to be male, younger, black/African American, Hispanic/Latino, MSM, compared with all persons diagnoses with HIV infection in the United States. The purpose of this study was to determine which population was more affected by the HIV infection (Krueger et al., 2016).

The study was conducted using HIV diagnoses data collected from the 2013 NHSS and the 2013 NHM&E surveillance reports. The NHSS provided test results that were reported to the CDC through June 2014. The time frame for which the data were collected through the NHM&E's data was unclear. The overall data consisted of people aged 13 years and older who were newly diagnosed with HIV infection in one of the 50

states or the District of Columbia in 2013. First, Krueger et al. (2016) calculated the percentages of the CDC-funded tests (NHM&E data) by age, sex, race/ethnicity, and region. Next, the researchers compared the estimated percentage of U.S. persons diagnosed with HIV in 2013 (NHSS data) with people diagnosed with a CDC-funded HIV test in 2013 (NHM&E data) by age, sex, race/ethnicity, region, and transmission category. The time parameters for the study were not identified. The data analyses were conducted using the SAS version 9.3 (Krueger et al., 2016).

Following the analysis, the researchers determined that the study partially supported their hypothesis. Among the people who received a CDC-funded test, 41.1% were aged 20-29 years, 22.9% were aged 30-39 years, 49.2% were male, 46.2% were black/African American, 21.4% were Hispanic/Latino, and 56.2% of the tests were conducted in the South. The percentage of young adults and blacks/African Americans was the largest population affected by the HIV infection who was diagnosed using the CDC-funded tests. The Hispanic/Latinos and MSM population were lower among those tested with a CDC-funded test than nationally. One fourth of the CDC-funded diagnoses for males were unknown, invalid, missing, or unclassified for transmission risk. This caused a gap among MSM nationally and those diagnoses made with CDC-funded tests. The NHSS also had a similar proportion of persons missing transmission risk information. In addition, the data may have been skewed due to the NHSS using a longer time frame to assess transmission risk factors than NHM&E. The researchers concluded

that the CDC-funded HIV testing programs should use strategies to increase HIV testing and diagnoses among MSM and Hispanic/Latinos (Krueger et al., 2016).

Krueger et al. (2016) identified three weaknesses of the study. First, the persons newly diagnosed with a CDC-funded test were based on self-report and were subject to misclassification bias as some people may not admit to a previous diagnosis. Thus, the researchers may have overestimated the number of new HIV diagnoses from CDC-funded tests. Secondly, a large percentage of transmission risk information was missing in both data systems, which may have underestimated the number of MSM CDC-funded tests diagnosed. Lastly, NHM&E data were not mutually exclusive from NHSS. Regardless of the limitations, this study suggested that, in 2013, the CDC-funded HIV testing programs were reaching young people and blacks/African Americans (Krueger et al., 2016).

The study is relevant to the current study only to provide a knowledge basis foundation for the current studies. It gives a general insight of the populations affected by the HIV infection in the United States. It does not focus on one geographical location like other studies. It does not answer any of the research questions pertaining to the current research. The previous researchers suggested increasing HIV testing and diagnoses among MSM and Hispanic/Latinos. The current researchers can use that recommendation in the current study. A theoretical concept was not tested in this study, but Nola Pender's Health Promotion Model will be utilized for the proposed study.

Copeland et al. (2017) gathered data to assess the knowledge of the workforce that work with people who have been diagnosed with HIV. Although there have been many advancements with HIV research, the rate of new infections in the United States was approximately 50,000 per year in 2015, according to the CDC. The southern US accounted for 45% of those new infections and had 46% of HIV-related deaths in the United States. Even though they are considered minorities, the African American and Hispanic/Latino communities are disproportionately affected by HIV. The non-medical community workers play a critical role in the support provided to people living with HIV. For this reason, the researchers deemed it vital to assess their scientific and treatment knowledge related to HIV, because a similar study had not been conducted. A theory was not used in this study (Copeland et al., 2017).

Copeland et al. (2017) identified two main questions about which they were seeking to gather research. First, the researchers wanted to evaluate non-medical workers' knowledge of HIV science, treatment, and biomedical interventions. Also, they wanted to know their beliefs and attitudes toward the research. Secondly, they wanted to assess the correlation between the workers' knowledge levels and their attitudes toward new treatment (Copeland et al., 2017).

Copeland et al. (2017) collected data in 4 waves. They used a 62-question survey that consisted of 21 demographic and screening information, 26 HIV/AIDs knowledge questions, and 15 questions related to workers' attitudes toward treatments. Respondents were asked in the knowledge section to rate their familiarity of treatments based on a 5-

point interval scale. The first data was collected in 2012 at the US Conference on AIDS. The second wave of data were collected online in 2013 with a national rollout. In 2013, the survey was also sent online in Spanish for Spanish speaking workers. Finally, the last of the data were collected online in 2014 from the department of health workers and AIDS directors. The population consisted of 3,663 completed surveys. Inclusion criteria for the study included those aged 18 or older, employees or volunteers of an AIDS service organization or health department, and willingness to complete the survey with or without incentives (Copeland et al., 2017).

From the data collected, Copeland et al. (2017) analyzed the results for gaps in the workers' knowledge. On average 61% of the knowledge questions were answered correctly. Questions related to pre-exposure prophylaxis (PrEP), experimental topical microbicides, experimental HIV vaccines, and TAP showed that less than half of the respondents were "very familiar" with those treatments. Only 55% of them felt they had the proper training and education related to treatments. Eighty-six percent of participants did say they were interested in learning more about the treatments. On average those with higher knowledge scores had more positive attitudes about the different treatments. Below average knowledge was strongly associated with Spanish as the primary language, African American or Hispanic ethnicity, working for smaller organizations, and living in the South (Copeland et al., 2017).

Copeland et al. (2017) identified many strengths and weaknesses with their study. One weakness that the researchers identified was that the large convenience sample may

not be a good representation of the general non-medical HIV workforce. The Hispanic/Latino community as defined by the US census may have been different from what researchers classified as Hispanic. A strength of this study is that it was one of the first studies that evaluated the knowledge and attitudes of non-medical HIV workers (Copeland et al., 2017).

The study conducted by Copeland et al. (2017) provided a solid foundation for future research and is potentially relevant to the current research. The South was identified as the region where workers are less knowledgeable of different treatments. The research provided by Copeland et al. (2017) is pertinent in helping identify the gaps with educating non-medical workers; however, the current researchers will more than likely be assessing HIV knowledge of students on a rural campus university in Mississippi.

The Ma, Malcolm, Diaz-Albertini, and Klinoff (2016) study examined HIV testing characteristics and factors related to testing among Hispanic adolescents. The researchers found that previously there was little known about HIV testing among Hispanic adolescents, even though the threat for HIV infection is critically elevated in the Hispanic community. The researchers estimated that Hispanics had an HIV infection rate that was approximately three times greater than non-Hispanic whites. It was shown that the infection rates were even higher among the youth (Ma, Malcolm, Diaz-Albertini, & Klinoff, 2016).

The researchers conducted this study using a survey. There were 223 Hispanic adolescents aged 13-16 years old who completed the survey. The informed consent was obtained from all study participants and their parents/guardian. The adolescents were recruited from programs serving Hispanic youth such as parks, schools, after school programs, and shopping malls. The participants completed a survey on demographic variables, HIV testing, and HIV risk behaviors. The survey was conducted on a computer tablet, which the participants were oriented to use. The survey items included questions on HIV testing motivation, perceptions, and experience, sexual intercourse history, and two questions on history of substance use. There was a research assistant available to help address any questions while the participant answered the survey (Ma et al., 2016).

The results of the study showed that only 9% of the adolescents reported having had an HIV test. Approximately 23% of these adolescents indicated a positive history of sexual intercourse. Interestingly, adolescents with a history of substance use were significantly more likely to have had an HIV test. For those adolescents who had not been previously tested for HIV, 32.5% expressed an interest in having the testing done. Interest in testing was also associated with those who answered positively to the history of substance use. Almost 50% of those that participated in the study were in favor of getting HIV tested (Ma et al., 2016).

The researchers' results suggest that despite the low testing rate, HIV testing is favorably perceived by Hispanic youth. The researchers maintain that despite the CDC recommendation of routine opt-out HIV screening for all individuals aged 13-64 years

old, over 90% of the adolescents in the current study had not been tested, including those who expressed interest in doing so. It was found in this study that only 20% of those who have been tested for HIV were initiated by physicians. Those Hispanic adolescents who are considered high risk are those that engage in substance use or have a sexual history of intercourse. The researchers believe that testing should expand beyond the primary healthcare settings to reach these adolescents. The researchers suggest that alternative strategies be used to enhance HIV testing including: (a) door-to-door testing, (b) mobile outreach, (c) adolescent-based programs in community settings, and (d) school-based testing (Ma et al., 2016).

Limitations to this study include the cross-sectional design, self-reporting data, and the small sample size of the Hispanic community. The researchers found that even though the adolescents were extremely interested in having HIV testing performed, a majority of the sexually active adolescents had not been tested for HIV (Ma et al., 2016). The researchers believe that future research and clinical practice should explore social and structural barriers to HIV testing that are specific to Hispanic youth, and to identify culturally appropriate strategies to enhance testing accessibility (Ma et al., 2016).

The researchers did many things well in this study. The design and implementation for the survey was well thought out. The researchers used the NOVA Research System questionnaire to help gather the data. The researchers used a tablet for survey answers and had a research assistant nearby to assist in any way possible. The data could have been more in depth. The researchers could have asked more questions on the

survey and comprised more data with the given information. The researchers could have found more high traffic places to conduct the survey with more participants involved.

This current study is applicable in that it targets an HIV high risk population. The current study found that few adolescents had taken an HIV test. The current research group asked college students if they have ever had an HIV test and found that HIV testing is positively perceived by Hispanic adolescents. The goal is that current research will find out if HIV testing is something in which the college student population is willing to participate, and what their knowledge is regarding HIV. In the current study, adolescents who have been engaging in high risk behavior expressed interest in having the HIV testing performed. Given the positive perception in that population, prevention efforts can be maximized. In our research group, we tested college students who probably have a positive sexual history. Hopefully, current testing will focus on minimizing barriers in HIV testing and enhancing accessibility to HIV screening in the college population.

CHAPTER III

Methodology

The study was designed to determine if college students were knowledgeable of human immunodeficiency virus (HIV) infection and transmission. The study was also utilized to determine if there was a correlation between HIV knowledge and the willingness of college students to participate in free HIV screening. This study provided insight to healthcare providers by reviewing statistical data regarding the knowledge level of college students. It was also designed to provide the population with more effective health promotion in relation to HIV and HIV testing in the future. This chapter describes the design of the study, setting, population and sample, methods of data collection, methods of data analysis, and the expected interaction from the collected data.

Design of the Study

A non-experimental, descriptive survey was used in this research. The HIV Knowledge Questionnaire (HIV-KQ-18) (see Appendix A) is a self-administered questionnaire that is used to assess knowledge needed for HIV prevention (Carey & Schroder, 2002). The researchers chose this format and design because it allowed data to be collected and analyzed effectively during a month-long process. This type of design allowed students to answer anonymously. The survey was written to determine a valid measure of HIV-related knowledge in street outreach (Carey & Schroder, 2002). The researchers modified questions for an updated version to apply toward their research.

Demographic information and willingness to participate in a free HIV test was gathered in addition to the Modified HIV Knowledge Questionnaire (see Appendix B).

Setting for the Research Project

The research was conducted at a rural university in the southeastern United States. The facility in which the surveys were conducted was the university's Campus Health Center. The Institutional Review Board (IRB) gave approval to conduct our study at the Campus Health Center and the dining hall (see Appendix C). The surveys were planned to be distributed and collected at two separate locations to allow for access to a greater number of students. Due to COVID-19, we were unable to distribute surveys at the dining hall location. Paper copies of surveys were handed out for students to privately answer. Upon completion, students at the Campus Health Center placed their completed surveys into a self-sealed envelope. The envelope was then placed into a box by the survey administrator.

Population and Sample

The population consisted of students at a rural university in the southeastern United States. The sample consisted of students aged 18 and older who participated in the survey event. This was a sample of convenience. The chosen group of participants were students enrolled at the rural university in the southeastern United States and were required to be age 18 years of age or older. The human rights of the participants in this study were protected. Risk and benefits of the study were discussed with the participants

within the instructions of the survey. Informed consent was stated upon participation in the survey.

Method of Data Collection

The research study was not conducted until approval was received from the IRB. The IRB gave approval to conduct the study at the Campus Health Center and the dining hall at the chosen rural university in the southeastern United States. Unfortunately, the event to conduct the study at the dining hall was canceled due to COVID-19. A written request was submitted to the coordinator of the Campus Health Center to request permission to survey the students at the rural university in the southeastern United States. Upon approval from the coordinator, the questionnaire and the demographic survey was electronically submitted to the research advisor. After approval from the research advisor and IRB, the survey was handed out to the students at the Campus Health Center. The study was conducted during a month-long time frame at the Campus Health Center. This length of time gave researchers the opportunity to obtain more data. The material was obtained via survey to determine the knowledge-level of college students regarding HIV and their willingness to participate in a free HIV test. The HIV-KQ-18 is a measurement instrument that measures an individual's HIV-related knowledge (Carey & Schroder, 2002). HIV-KQ-18 was originally HIV-KQ-45; however, the older version seemed impractical for field surveys, street outreach, and situations in which evaluations for interventions are needed. A study by Carey and Schroder concluded that the HIV-KQ-18 was more practical because of the "easy-to-use and easy-to-score measure of HIV-related

knowledge” (Carey & Schroder, 2002, p. 181). Scoring was provided along with the HIV-KQ-18 and a copy of the correct answers were provided to the participants upon completion of the survey. The researchers in this study modified questions three and four of the HIV-KQ-18 to allow the questionnaire to be gender neutral. The questionnaire was administered on campus to 38 college students aged 18 years and above at the Campus Health Center. The questionnaire consisted of questions in which the respondents will answer by circling “T” for true, “F” for false, and “IDK” for I don’t know. All questions were succinct and pertained solely to this research. The modified HIV-KQ-18 questionnaire took between 10 and 15 minutes per student to answer. The target demographic population was college students, 18 years or older, who currently attended the rural university. The students placed their completed surveys into a self-sealed envelope and then placed their envelope into a box located with the survey administrator. This questionnaire was anonymous with no identifying factors. No incentives were offered to the students for answering the questionnaire. All questionnaires were analyzed and scored for correct answers. The results of this study showed both the willingness of college students to participate in free HIV testing, as well as the correlation of their knowledge of HIV and HIV testing. The researchers used the HIV-KQ-18 Questionnaire as a guideline for the survey. This questionnaire is available for public use and no permission was needed to use in this study (Carey & Schroder, 2002). The researchers developed a demographic survey which assisted in defining the participant’s age range, gender, race, and willingness to participate in a free HIV test at the Campus Health

Center. The researchers modified questions 3, 4, and 10 of the HIV-KQ-18 as a method of updating the questionnaire and applying it toward society today. The modified HIV-KQ-18 (see Appendix B) questionnaire helped determine the college student's knowledge-level of HIV. There were not any distinguishable differences in the selected group. The correct answers to the modified HIV-KQ-18 questionnaire were provided to the participants of the study after they completed their individual survey.

Method of Data Analysis

Following data collection, the students entered the data from the completed questionnaires into an Excel processing spreadsheet. This information was submitted to a professional statistician. Statistical analysis was performed by a statistician using SPSS. Demographic data, knowledge-based question scores, and willingness to participate were analyzed and compared. Findings from the study are reported in the following chapter.

CHAPTER IV

Research Findings

The purpose of this study was to determine if college students were knowledgeable of human immunodeficiency virus (HIV) infection and transmission. The study was also utilized to determine the willingness of college students to participate in free HIV screening, which was beginning at the university's Campus Health Center. The results of the study can be used by providers in the southeastern United States to provide the population with more effective health promotion related to HIV and HIV testing, based on the knowledge level of the participants in the study.

Profile of Study Population

Data for the study were obtained from a convenience sample of college students via a questionnaire that was modified by the researchers. The questionnaire was available and given to all college students in the Campus Health Center who were 18 years or older. The survey was available at the Campus Health Center from February until April of 2020. The study sample included 38 participants. The data was collected from the surveys and entered in an Excel document.

The questionnaire consisted of demographic data which included age, assigned sex, current gender identity, and race. The demographic questions were followed by 18 questions to determine college students' knowledge of HIV and transmission. Lastly, the questionnaire concluded with two questions to determine college students' prior

participation in HIV testing and their current willingness to participate in free HIV testing offered by the Campus Health Clinic.

When reviewing demographic data of the study population, the college students' age was assessed first (see Figure 1). Of the 38 participants, 94.7% of students were age 18-24 (n=36) and 5.3% of students were age 25-31 (n=2). The next question was used to determine the birth sex of the students (see Figure 2). Of the 38 participants, 13.2% were male (n=5), 84.2% were female (n=32), and 2.6% preferred not to say (n=1). The next question was used to determine the students' current gender identity (see Figure 3). Data revealed that 13.2% identified as male (n=5), 81.6% identified as female (n=31), 2.6% identified as transgender female to male (n=1), and 2.6% preferred not to say (n=1). The last question of the demographic questionnaire assessed students' race (see Figure 4). Of the 38 participants, 47.4% of students were Caucasian (n=18), 42.1% were African American (n=16), 5.3% were Asian (n=2), and 5.3% of students preferred not to say (n=2).

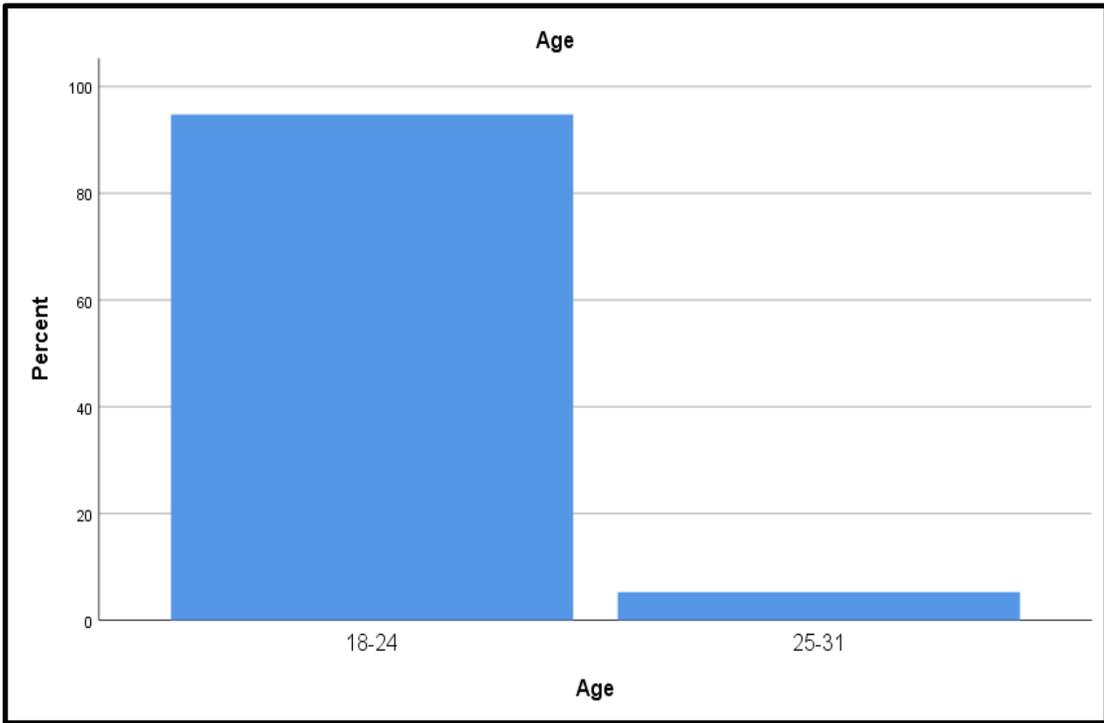


Figure 1. Age

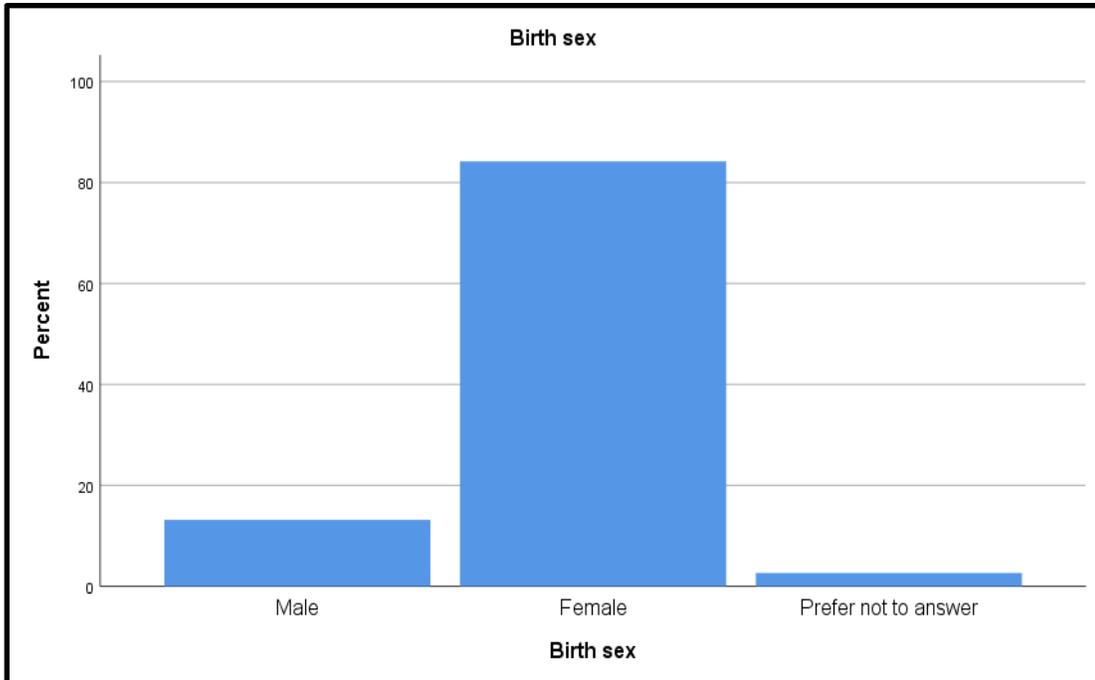


Figure 2. Birth Sex

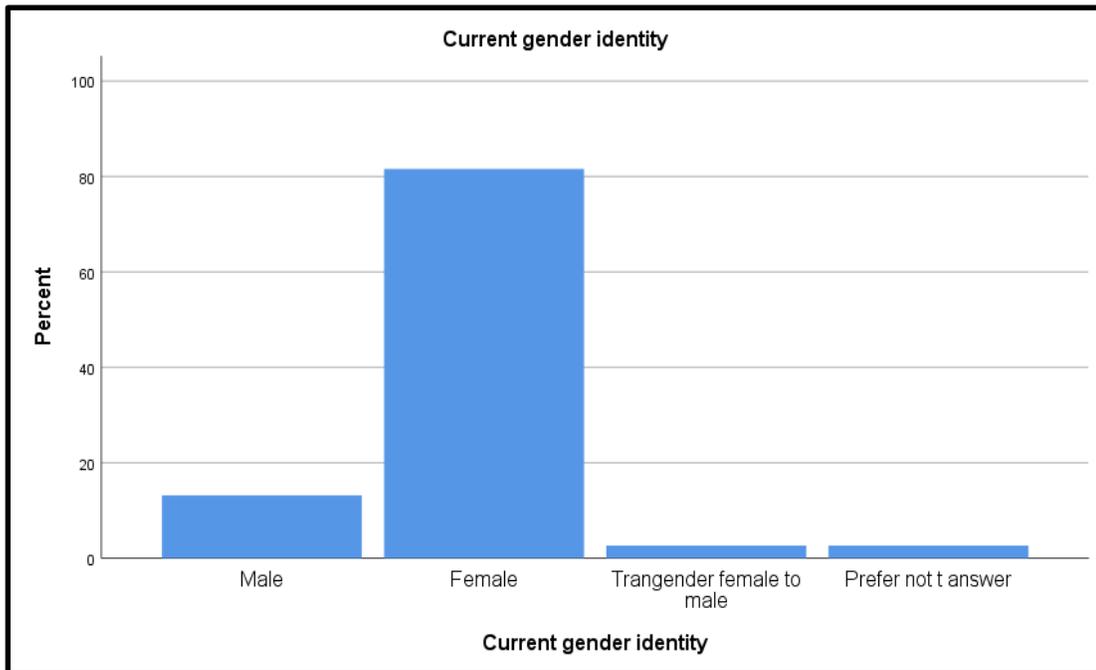


Figure 3. Current gender identity

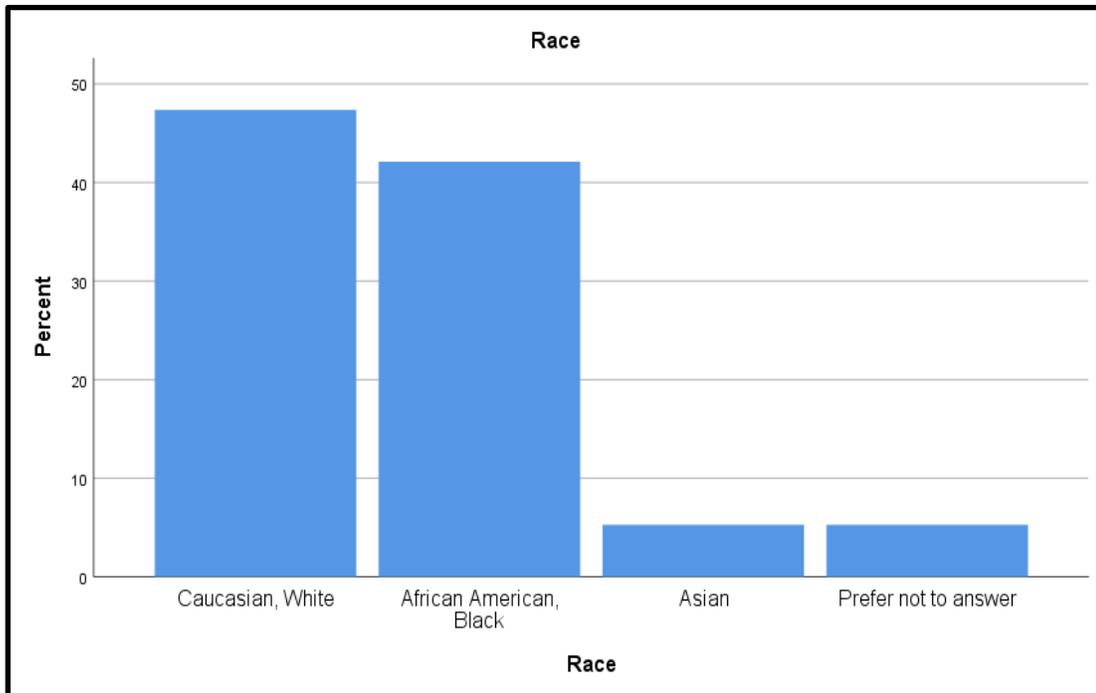


Figure 4. Race

Statistical Results

Again, the purpose of this study was to determine college students' knowledge of HIV and their willingness to participate in HIV screening. Data was collected from the Campus Health Center, where 38 questionnaires were completed by college students. The HIV-KQ-18 questionnaire was used in this study. Researchers modified three questions to make them more gender neutral. The researchers collected the surveys, entered responses in an Excel file, then transferred the data to a professional statistician for statistical analysis. The statistician utilized SPSS 25.0 to conduct the descriptive analyses and chi-square analyses of association. The researchers examined the statistical results to answer the two research questions.

Findings Related to the Research Questions

Research question 1.

Are college students knowledgeable regarding HIV infection and transmission?

Of the 38 questionnaires completed, the average score on the 18 knowledge-based questions was 71.49%. The minimum score was 27.78%, and the maximum score was 94.44%. There were three questions on which students overall answered poorly. Question nine stated that people are likely to get HIV by deep kissing and putting their tongue in their partner's mouth if they have HIV. The correct answer was false, and only 47.4% of students answered correctly. Question 12 was regarding natural skin condoms working better than latex condoms. Of the 38 respondents, 42.1% knew that this was a false statement. The final question that students scored poorly on was question 15. Only 47.4%

of students knew that taking an HIV test one week after having sex will not tell a person if they have HIV or not. Data analysis revealed that college students were not knowledgeable of HIV infection and transmission based on the researchers' operational definition of "knowledgeable" in chapter one. A score of 72.2%, or 13 correct responses out of 18 questions, was considered knowledgeable. The mean score of the questionnaire was 71.49%; therefore, the researchers concluded college students were not knowledgeable regarding HIV infection and transmission.

Research question 2.

Is there a correlation between HIV knowledge and willingness to participate in free HIV screening? To determine if any one knowledge question was associated with willingness to test, Chi-square tests of association were conducted and Spearman rank correlations were run for each of the knowledge questions, and there was only one significant association, as a 2 tailed *t*-test. The knowledge question that was associated with willingness to test was "A natural skin condom works better against HIV than a latex condom does". The results of that analysis are below. The association is very weak and there is also a very weak negative correlation (as one value increases, the other decreases), indicating more individuals who answered incorrectly were a little more likely to be willing to test (X^2 [N=38, df=1]=4.48, $p=.034$; r_s [N=38]=-0.34, $p=.04$). The tests suggest that there was not a correlation between college students' HIV knowledge and their willingness to participate in free HIV screening. This is likely because a large majority of the participants reported willingness to participate in screening; therefore,

there was not an adequate sample of students unwilling to test in order to conduct a sufficient comparison.

Data Analysis

Data analysis of research question one revealed the lack of knowledge college students have regarding HIV infection and transmission. There was only one student who scored the lowest score of 27.78%. This student correctly answered five questions out of 18 questions. Three students scored the highest score of 94.44% by answering 17 out of 18 questions correctly. The mean score of 71.49% proved that college students were not knowledgeable of HIV infection and transmission based on the researchers' definition of knowledgeable in Chapter One of this current research.

The survey ended with students being asked about previous HIV testing and their willingness to participate in free HIV screening offered at the Campus Health Center. When students were asked if they had previously participated in an HIV test, only 28.9% of students answered true (see Figure 5). Additionally, 92.1% of students answered that they would currently be willing to participate in an HIV screening (see Figure 6).

Two variables were analyzed to address the second research question involving a correlation between HIV knowledge and students' willingness to participate. Two analyses were conducted using Spearman's rank correlation and an unpaired *t*-test. According to Spearman's rank correlation, the variable "I would be willing to participate in a free HIV test" and the prevent knowledge score were not significantly correlated ($r_s [38] = -.296, p=.071$). The mean knowledge score for those willing to participate in

testing was 70.3%. The mean knowledge score for those not willing to participate in testing was 85.19%. Results from the independent samples *t*-test suggests that the null hypothesis cannot be rejected. There is no statistically significant difference in the means of the score on the knowledge questions of those willing to participate in testing and those not willing to participate in HIV testing ($t[N=38, df=36]=1.577, p=.124$). Both tests suggest the lack of correlation between the students' knowledge and their willingness to participate in HIV testing.

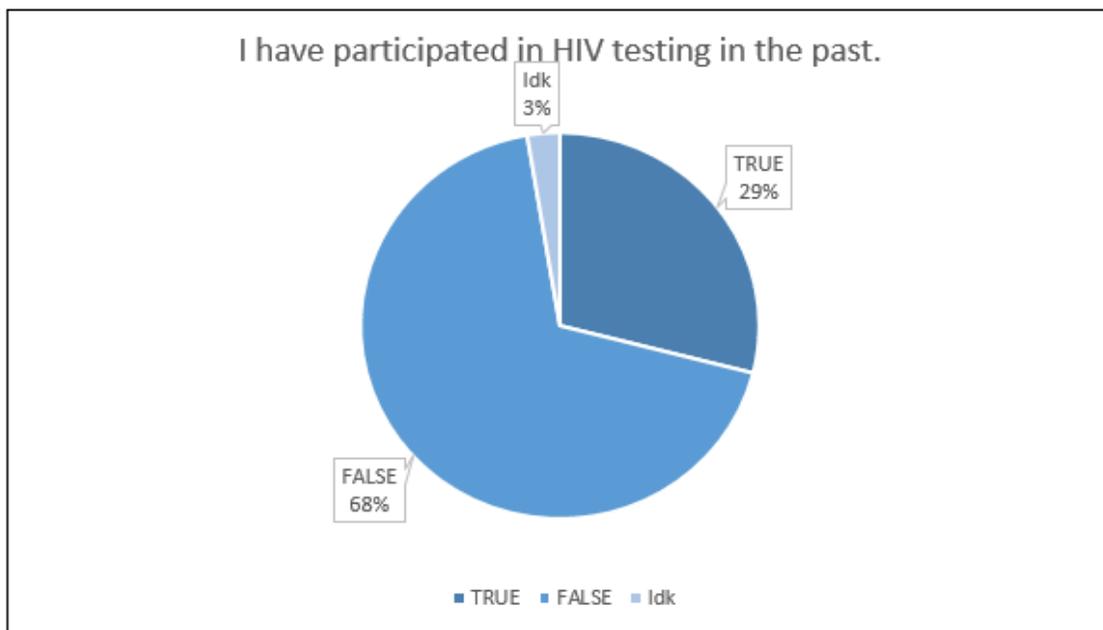


Figure 5. Previous HIV testing

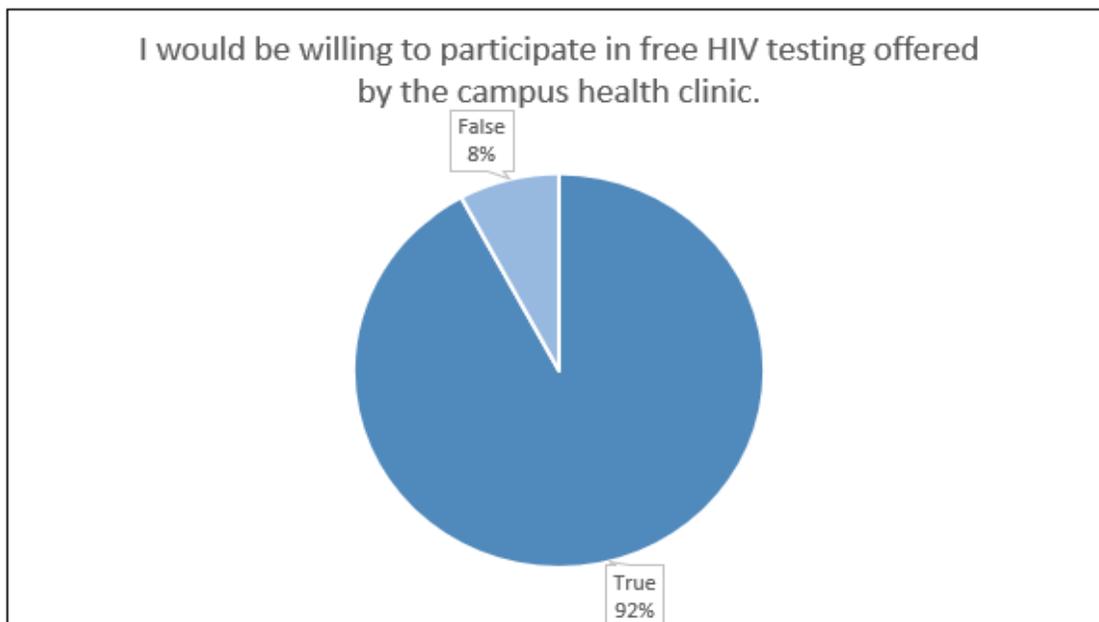


Figure 6. Willingness to participate

Summary Findings

In total, 38 surveys were collected where participants responded to a survey that assessed for their knowledge of HIV infection and transmission and their willingness to participate in free HIV screening. The research study revealed that college students were not knowledgeable regarding HIV infection and transmission. Data analysis also revealed that there is not a correlation between college students' knowledge about HIV and their willingness to participate in free HIV screening.

CHAPTER V

Outcomes of the Research

Summary and Discussion of the Findings

Several interesting results emerged as a result of the data analysis. The predetermined operational definition of “knowledgeable”, as set forth by the researchers, was indicated by correctly answering 13 of the 18 (72.2%) knowledge-based questions correctly. A score below a 13 out of 18 (72.2%) was considered unknowledgeable. The research study revealed that the mean knowledge score for those willing to participate in testing was 70.3%. The knowledge score for those not willing to participate in testing was 85.19%. Results from the independent samples *t*-test suggests that the null hypothesis cannot be rejected. There is no significant difference between the means of the score on the knowledge questions of those willing to participate in testing and those not willing to participate in HIV testing. The average score on the knowledge-based questions was 71.49%, which was below the benchmark set by the researchers of 72.2%. There is a lack of education and screening practices, irrespective of most of the demographic data collected.

One noteworthy discovery was of the 38 respondents, no respondents scored 100%. Another interesting finding was that over 90% of the participants answered correctly that having sex with more than one partner can increase a person’s chance of being infected with HIV. With this information, it holds true to the proposition that

education needs to be provided to improve implementation of the new HIV screening recommendations.

Limitations

Data was collected using 38 questionnaires from respondents who are students at a university in the southeastern United States. Due to the COVID-19 pandemic, the sample size was limited in this study and does not accurately represent the knowledge of the college age students in the country. Collecting data was limited to only those students who attended the Campus Health Center due to Covid-19 closure of the university campus. Furthermore, the short time frame for this study to be complete limited that number of questionnaires collected.

Conclusion

The motivation of the current research study was to determine college students' knowledge of HIV and their willingness to get tested for HIV. As discussed in the previous sections, the Centers for Disease Control and Prevention (CDC) has set forth evidence-based recommendations to have every person between the ages of 13 and 64 to be tested once for HIV. According to the results, 68% of participants have not participated in HIV testing. Fortunately, 92% of participants are willing to be HIV tested. Of the 38 questionnaires completed, the average score on the 18 knowledge-based questions was 71.49%. The minimum score was 27.78%, and the maximum score was 94.44%. The fact that the average score of the students was 71.49% on the knowledge-

based questions is evidence supporting that students were not knowledgeable regarding HIV.

Implications

Healthcare providers have the advantage and responsibility to take an aggressive approach toward HIV screening and prevention in the adolescent and young adults by adhering to recommendations created by the CDC. Based on the data collected from this research study, there is a need for further education of the CDC's HIV screening and prevention recommendations. HIV infection has remained a serious public health concern in the United States, with individuals aged 13-24 years accounting for more than one in five new HIV diagnoses in 2014. The CDC estimates that 44% of HIV-infected youth ages 18-24 are unaware of their status. Although many are unaware of their HIV status, there is a great willingness to be tested.

With the increasing number of newly HIV-infected individuals, it is crucial for healthcare providers to be a line of defense for such statistics. With the modern advances in technology, healthcare providers should have even more ways of accessing and educating the public regarding HIV. Healthcare providers can greatly decrease the risk of exposure to HIV by conducting early interventions, providing education, and screening those at risk. The researchers suggest that awareness of these recommendations be expanded by educational in-services to clinicians, schools, community wide programs, and to the public using health fairs.

Recommendations

Based on the findings of the study, discussions for future study is recommended. The population of this study was limited to just the students at one university in the southeastern United States, therefore reducing the validity of the data collected. If another study is done regarding this topic, researchers should take action to expand the tested subjects at the university and not just those who attended the Campus Health Center.

Collecting a more evenly dispersed sample over a broader age group would be interesting to analyze. The majority (97.4%) of students were between the ages of 18-24, leaving a huge gap in the knowledge level of students above this age range. Determining true student knowledge could guide researchers where to provide awareness and educational teachings.

Another recommendation for future research regarding this disparity would be to allow more time to complete this study. The limited time in this study prevented a broader range of age in students and a larger sample study. By providing additional time to complete the study, a greater variety of age, race, and gender would allow the study to provide more accurate results.

As discussed, future research on this study is vital to guide educational programs. The need to increase awareness of HIV is motivated by continued research on this study. The findings indicated that future research in the college campus community is warranted. This study raised several subject matters that could provide future research topics. These include future investigation into the willingness to be tested, knowledge

level of the faculty versus students, and knowledge regarding the actions to be taken after HIV exposure.

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APPENDIX A

HIV Knowledge Questionnaire

HIV-KQ-18

For each statement, please circle "True" (T), "False" (F), or "I don't know" (DK). If you do not know, please do not guess; instead, please circle "DK."

	True	False	I don't know
1. Coughing and sneezing DO NOT spread HIV.	T	F	DK
2. A person can get HIV by sharing a glass of water with someone who has HIV.	T	F	DK
3. Pulling out the penis before a man climaxes/cums keeps a woman from getting HIV during sex.	T	F	DK
4. A woman can get HIV if she has anal sex with a man.	T	F	DK
5. Showering, or washing one's genitals/private parts, after sex keeps a person from getting HIV.	T	F	DK
6. All pregnant women infected with HIV will have babies born with AIDS.	T	F	DK
7. People who have been infected with HIV quickly show serious signs of being infected.	T	F	DK
8. There is a vaccine that can stop adults from getting HIV.	T	F	DK
9. People are likely to get HIV by deep kissing, putting their tongue in their partner's mouth, if their partner has HIV.	T	F	DK
10. A woman cannot get HIV if she has sex during her period.	T	F	DK
11. There is a female condom that can help decrease a woman's chance of getting HIV.	T	F	DK
12. A natural skin condom works better against HIV than does a latex condom.	T	F	DK
13. A person will NOT get HIV if she or he is taking antibiotics.	T	F	DK
14. Having sex with more than one partner can increase a person's chance of being infected with HIV.	T	F	DK
15. Taking a test for HIV one week after having sex will tell a person if she or he has HIV.	T	F	DK
16. A person can get HIV by sitting in a hot tub or a swimming pool with a person who has HIV.	T	F	DK
17. A person can get HIV from oral sex.	T	F	DK
18. Using Vaseline or baby oil with condoms lowers the chance of getting HIV.	T	F	DK

APPENDIX B

Modified HIV Knowledge Questionnaire

We are MSN students and this survey aides us in our graduate research. By completing and submitting this survey, you are agreeing to participate in this research study conducted by the student researchers. This survey is intended for college students 18 years of age and older. Please refrain from taking this survey if you are under the age of 18 or if you are not a college student. This study is voluntary, and all answers will be kept confidential. This is an anonymous study. Please do not provide your name or any other identifiers. You may withdraw from the study at any time until the survey is submitted. Once you have completed this survey, place it in the self-sealing envelope that has been provided to you. Please return the sealed envelope to the survey administrator to be placed in a box.

DEMOGRAPHICS

Please select the most appropriate answer to the following questions:

1. Age of participant:

- | | |
|--------------------------------|--------------------------------------|
| <input type="checkbox"/> 18-24 | <input type="checkbox"/> 32-49 |
| <input type="checkbox"/> 25-31 | <input type="checkbox"/> 50 or older |

2. Participant's assigned sex at birth:

- | | | |
|-------------------------------|---------------------------------|--|
| <input type="checkbox"/> Male | <input type="checkbox"/> Female | <input type="checkbox"/> Prefer not to say |
|-------------------------------|---------------------------------|--|

3. Participant's current gender identity:

- | | |
|---|--|
| <input type="checkbox"/> Male | <input type="checkbox"/> Transgender unspecified |
| <input type="checkbox"/> Female | <input type="checkbox"/> Another gender |
| <input type="checkbox"/> Transgender male to female | <input type="checkbox"/> Prefer not to say |
| <input type="checkbox"/> Transgender female to male | |

4. Participant's race:

- American Indian/Alaska Native Caucasian/white
 Asian Multiracial
 African American/black Prefer not to say

KNOWLEDGE

These questions simply test your knowledge of HIV. Please follow the instructions below.

INSTRUCTIONS: For each statement below please circle "True" (T), "False" (F), or "I don't know" (IDK). If you do not know the correct answer, please do not guess instead circle (IDK) for "I don't know."

	True	False	I don't know
1. Coughing and sneezing DO NOT spread HIV.	T	F	IDK
2. A person can get HIV from sharing a glass of water with someone that has HIV.	T	F	IDK
3. Pulling out the penis before a man climaxes/cums keeps their partner from getting HIV during sex.	T	F	IDK
4. A man or woman may get HIV by having anal sex with a man.	T	F	IDK
5. Showering or washing one's genitals/private parts after sex keeps a person from getting HIV.	T	F	IDK
6. All pregnant women infected with HIV will have babies born with AIDS.	T	F	IDK
7. People who have been infected with HIV quickly show serious signs of being infected.	T	F	IDK
8. There is a vaccine that can stop adults from getting HIV.	T	F	IDK
9. People are likely to get HIV by deep kissing, putting their tongue in their partner's mouth, if	T	F	IDK

they have HIV.			
10. A woman cannot get or give HIV if she has sex during her period.	T	F	IDK
11. There is a female condom that can help decrease a woman's chance of getting HIV.	T	F	IDK
12. A natural skin condom works better against HIV than a latex condom does.	T	F	IDK
13. A person will NOT get HIV if she or he is taking antibiotics.	T	F	IDK
14. Having sex with more than one partner can increase a person's chance of being infected with HIV.	T	F	IDK
15. Taking a test for HIV one week after having sex will tell a person if he or she has HIV.	T	F	IDK
16. A person can get HIV by sitting in a hot tub or swimming pool with a person who has HIV.	T	F	IDK
17. A person can get HIV from oral sex.	T	F	IDK
18. Using vaseline or baby oil with condoms lowers the chance of getting HIV.	T	F	IDK
<u>HIV TESTING</u>			
1. I have participated in HIV testing in the past.	T	F	IDK
2. I would be willing to participate in a free HIV test offered by the campus health clinic. (This question does not indicate your actual participation in the HIV test, only the willingness to participate.)	T	F	IDK

Appendix C



February 3, 2020

Dr. Beth Turner
College of Nursing and Health Sciences
1100 College St. W-910
Columbus, MS 39701

Dear Dr. Turner:

I am pleased to inform you that the members of the Institutional Review Board (IRB) have reviewed the following proposed research and have approved it as submitted:

Name of Study:	College students' knowledge of Human Immunodeficiency virus (HIV) and willingness to participate in screening
Research Faculty/Advisor:	Beth Turner
Investigators:	MSN Students

I wish you much success in your research.

Sincerely,

Scott Tollison, Ph.D.
Provost and Vice President for Academic Affairs

ST/tc

pc: Irene Pintado, Institutional Review Board Chairman