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Human Papillomavirus and Human Herpesvirus-8:
Knowledge, perception of risk and barriers to screening and treatment among selected
students at Africa University, Zimbabwe.

By

Rujeko O. Machinga

A Thesis Submitted in Partial Fulfillment of the
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Human Papillomavirus and Human Herpesvirus-8:
Knowledge, perception of risk and barriers to screening and treatment among selected
students at Africa University, Zimbabwe.

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ABSTRACT

Human Papillomavirus and Human Herpesvirus-8:

Knowledge, perception of risk and barriers to screening and treatment among selected students at Africa University, Zimbabwe.

Rujeko O. Machinga, MS. Minnesota State University, Mankato, May 2016.

Keywords: Human Papillomavirus, Human Herpesvirus-8), Zimbabwe, Cervical Cancer, Kaposi Sarcoma, Africa University.

In Zimbabwe, the most prevalent cancer in women is cervical cancer (CC) and in men is Kaposi Sarcoma (KS). A major risk factor for CC is Human Papillomavirus (HPV). For KS, the major risk factor is Human Herpesvirus-8 (HHV-8). The purpose of this study was to assess the knowledge of HPV and HHV-8, perception of risk, and perceived barriers to treatment among selected students at Africa University, Zimbabwe.

A questionnaire was distributed to participants ($n=130$). $N=127$ completed and $n=3$ did not. SPSS was used for data analysis. A mean knowledge score on HPV was 8.66 (7.98) out of 30 and on HHV-8 was 5.72 (5.83) out of 25. For perception of risk, 73.2% ($n=90$) believed they were moderately and extremely at risk every time they engage in sex, 55.8% ($n=63$) believed were moderately and extremely worried about contracting HHV-8 and 64.7% ($n=79$) were moderately and extremely worried about contracting HPV. Findings regarding participants' perceived barriers to accessing health facilities for STIs screening or treatment comprised of the following: 52.9% ($n=64$) did not consider access to medical facilities as a barrier, 83.5% ($n=101$) wanted to know

about their status if infected and 36.3% ($n=45$) considered lack of knowledge on STIs a barrier. Most common source with 44.9% ($n=52$) was the internet. Sampled students are not knowledgeable on HPV and HHV-8, but know they are at risk and are willing to address these health issues.

In overall, there is a great need for educational programming. STI related facilities are available in Zimbabwe for students to access. HPV or HHV-8 related education programming should be focused in hospitals and clinics. HPV vaccination programming should be administered actively throughout the country. Further research should consider broadening the study to other post-secondary institutions, involve faculty and staff participation, collect data in rural areas and focus on CC and KS.

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“For I know the plans I have for you,” declares the Lord, “plans to prosper you and not to harm you, plans to give you hope and a future. – Jeremiah 29:11(niv)

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CHAPTER ONE

INTRODUCTION

Introduction

Cancer is among the leading causes of morbidity and mortality worldwide (World Health Organization [WHO], 2015). Human Papillomavirus (HPV) is the major risk factor for cervical cancer (CC) (American Cancer Society, n.d). For Kaposi sarcoma (KS), the major risk factor is Human Herpesvirus-8 (HHV-8) (Cancer Net Editorial Board, 2014). HPV and HHV-8 are both sexually transmitted infections, although HPV can also be contracted through intimate skin contact, and HHV-8 could be also contracted through blood and saliva (Center for Disease Control and Prevention [CDC], 2015).

In Zimbabwe, young people 15-24 years old are the group most vulnerable to sexually transmitted infections as a result of early sexual experimentation, limited access to information about sexual health, advice on responsible sexual behaviors, treatment availability for STIs, harmful cultural practices, and social and urbanization (Stally, 2003). If college students in Zimbabwe are aware of the risks on health HPV and HHV-8 have, they may be more likely to take certain precautions to avoid infection or seek treatment if already infected.

For this study, the Health Belief Model (HBM) was used as a conceptual framework to understand human health decision-making and subsequent behavior. The HBM helps predict public attitudes and actions about health issues and assumes that people are largely rational in their thoughts and actions towards health behaviors (Health Belief Model, n.d).

The sample for this study was selected from a private university, Africa University (AU) located in Manicaland Province, Mutare Zimbabwe. AU has about 1100 total students (Africa University, 2014). Six hundred and sixty are female students (60%), 420 are male students (40%) and 420 students (40%) are international students (Africa University, 2014). Variables that may influence the HBM constructs identified for this study are culture, economic status, education and past experiences of the sampled students. By researching this topic among students at AU, Zimbabwean young adults' knowledge and understanding of HPV and HHV-8 as the risks of CC and KS respectively will be assessed.

Problem Statement

Sexually transmitted infections (STI) present a serious health challenge in Zimbabwe. Zimbabwe has widespread and widely disseminated epidemics of most major sexually transmitted infections (Decosas & Padian, 2002). Research by Chadumbuka and colleagues confirmed that being knowledgeable about STIs did not translate into safer

sexual behaviors (Chadambuka et al., 2011). Zimbabwe Demographic and Health Survey by Zimbabwe National Statistics (ZIMSTAT) and ICF International (2012) recently reported that the percentage of young people aged 15-24 knowledgeable about Human Immunodeficiency Virus (HIV) is 56.4% for women and 51.7% for men. Another recent study by ZIMSTAT and ICF International (2012), identified that 51% of women and 43% of men did not seek any treatment when they had an STI or STI symptoms. The findings from these studies raise concerns about Zimbabwe's public health. Young adults who do not take precautions to avoid infection or lack proper screening and treatment for HPV or HHV-8 may be at risk for developing CC and KS. In order to implement education and awareness on CC and KS, it is important to study what young adults in Zimbabwe know about HPV and HHV-8 and evaluate their perception of risk of being infected by these viruses and their intentions to take action towards getting medical treatment. Information from this study can be used by the local government and health related non-government organizations to minimize any identified barriers, if identified, restricting this population from receiving adequate treatment.

Significance of the problem

Globally in 2012, 14.1 million new cancer cases occurred; 7.4 million cases in men and 6.7 million cases in women, and 8.2 million died from cancer (World Cancer Research Fund International, 2015). Worldwide for women, CC ranks

4th for the most common cancers accounting for 7.9% of all cancers (World Cancer Research Fund International, 2015). In males, KS ranks 23rd world wide for the most common cancers accounting for 0.4% of all cancers (World Cancer Research Fund International, 2015). However, in 2012, 84% of CC cases and 85% of all KS cases occurred in less developed countries (World Cancer Research Fund International, 2015; WHO, 2015). In Zimbabwe, a developing country located in Southern Africa, the most prevalent cancer in women is CC and in men it is KS (cancerresearchuk.org, 2014). The rates of CC in Zimbabwe are increasing at an average of 3.3% a year (Chokunonga et al., 2013). During the evolution of the epidemic of HIV/AIDS in Zimbabwe, there was an increase in incidence of KS between 1998 and 2000 (Chokunonga et al., 2013).

Given that HPV and HHV-8 lead to CC and KS respectively, taking preventive measures and steps towards treatment for these viruses is very important. In Zimbabwe between 2002 and 2005, STI cases increased by 31% while the median age at first sexual intercourse is currently 18.9 years for women and 20.6 years for men (ZDHS & ICF International, 2012). In addition, about six in ten Zimbabwean women have had sexual intercourse by the age of 20 while about 4 in 10 (42%) men have had sexual intercourse by age 20 (ZDHS & ICF International, 2012). Given that the predominant mode for STIs transmission is sexual intercourse, college aged young adults are at a very high risk for obtaining HPV and HHV-8 (WHO, 2015).

Much research identifies the problem leading to CC to be lack of CC screening (HPV Information Center, 2015). However, there is currently no data available on the

HPV burden on the general population of Zimbabwe (HPV Information Center, 2015). More research specifically targeting HPV knowledge and perception of risk to HPV would greatly benefit the Ministry of Health in Zimbabwe in reducing CC in the country. There is also very limited research pertaining to HHV-8 in Zimbabwe. In one study, Campbell, Borok, Ndemera, Fiorillo, White, Zhan, Machekano, Katzenstein & Gwanzura (2009) identified detection of HHV-8 to be associated with old age and HIV not sexual transmission. These findings explained the high prevalence of HHV-8 in Zimbabwean men (Campbell et al., 2009). Inclusive, there is a critical need to intensify mass education in Zimbabwe on the prevention of STIs, targeting young adults in order to inform them of the role of HPV and HHV-8 in development of CC and KS (Mupepi, Sampeselle & Johnson, 2011).

Purpose

The purpose of this study is to assess the knowledge of HHV and HHV-8 in its connection to CC and KS, perception of risk, and perceived barriers to treatment among sampled students at Africa University, Zimbabwe.

Research questions

For the selected sample at Africa University, Zimbabwe:

1. What is the extent of the students' knowledge about HPV?
2. What is the extent of the students' knowledge about HHV-8?

3. Do the students perceive themselves to be at risk for HPV infection?
4. Do the students perceive themselves to be at risk for HHV-8 infection?
5. What are the perceived barriers to accessing medical attention and treatment for HPV infection?
6. What are the perceived barriers to accessing medical attention and treatment for HHV-8 infection?
7. Where do students obtain their knowledge on STI's?

Limitations

1. Reluctance to respond may limit the number of completed surveys.
2. Due to the sensitivity of the survey questions, the students may not answer truthfully.
3. The quantitative measurements required participants to answer with options only provided by the researcher; precluding follow up questions for clarification.
4. Responses from the survey may not be representative of the entire university student population nor the general college aged population in Zimbabwe.

Delimitations

1. The sample is restricted to selected female and male students attending Africa University, Zimbabwe Spring of 2016.

2. This study is to be completed as a requirement for the Minnesota State University, Mankato Master's Degree, which limits the data collection and analysis time frame.
3. Due to lack of funding, the survey distribution is to occur in the absence of the primary researcher.
4. The study will not investigate the role of culture and values in exposure to information on STIs given that Africa University's student population is very culturally diverse.

Assumptions

1. Participants will respond truthfully.
2. Topics related to sexual behaviors are culturally uncomfortable to discuss.
3. There are barriers preventing young adults from obtaining annual STI medical check-ups in Zimbabwe.
4. Participants will clearly understand survey questions.
5. Young adults in Zimbabwe do not get yearly check-ups for STIs or cancer.

Definitions

Domestic students – students that are Zimbabwean citizens or permanent residents.

HHV-8 - Human Herpes Virus-8; the same as Kaposi Sarcoma associated herpes virus (American Cancer Society, 2014). HHV-8 is commonly transmitted through saliva (Pica & Volpi, 2007).

HPV- Genital Human papillomavirus. Very common sexually transmitted virus (Center for Disease Control and Prevention, 2015).

International students – students not citizens or permanent residents of Zimbabwe

Sexual activity/intercourse - homosexual or heterosexual sexual interaction that includes anal or vaginal penetration and genital stimulation by mouth between two people

Young adult - people aged between 18 years and 25 years.

CHAPTER TWO

REVIEW OF THE LITERATURE

Introduction

CC and KS continue to be a threat to the health of an average Zimbabwean. As a result, it is very important to assess the knowledge, perception of risk, and perceived barriers to treatment of Human Papillomavirus and Human Herpesvirus-8 in its connection to cervical cancer and Kaposi sarcoma.

The Health Belief (HBM) is a conceptual framework that explains human health decision-making and subsequent behavior used for this study (WHO, 2012). Among the six HBM constructs, perceived susceptibility, perceived severity and perceived barriers have been specifically chosen for investigation in this study.

Two types of HPV genotypes 16 and 18 are associated with cervical cancer (Veldhuijzen, Snijder, Reiss, Meijer, & van de Wijgert, 2010). The most common is genotype 16 (Chin'ombe, Sebata, Ruhanya, & Matarira, 2014). Lack of adequate preventive, screening measures and lack of HPV and cervical cancer knowledge puts Zimbabwean women at a much higher risk for these diseases, as compared to women of other countries (Mupepi et al., 2011).

The primary cause for all types of KS is HHV-8 (Cohen, Wolf, Guttman-Yassky, & Sarid, 2005); a virus similar to one that causes infectious mononucleosis (American Cancer Society, 2014). In Zimbabwe, AIDS-KS remains the most common among men (Chokunonga et al., 2010). Lack of knowledge among Zimbabwean young adults about

HPV, HHV-8, CC and KS may lead to low perceptions of severity and susceptibility for these diseases. In addition, embarrassment, attitudes, accessibility, lack of support, time, cost, and cultural practices are potential barriers for young adults in Zimbabwe to seek screening for HPV or HHV-8 (Mupepi et al., 2011). Topics covered in this literature review include the HBM, knowledge of HPV, HPV, CC and KS and the barriers to STI testing and treatment as identified by previous researches.

Health Belief Model

The Health Belief Model (HBM) is the most commonly used theory in health education and health promotion (Glanz, Rimer & Lewis, 1997). HBM attempts to explain and predict health behaviors (University of Twente, 2012). “The underlying concept of the original HBM is that health behavior is determined by personal beliefs or perceptions about a disease and the strategies available to decrease its occurrence” (Hayden, 2014, p. 32). The HBM is built on perceptions that form six theoretical constructs that guide health educators to predicting certain health behaviors (WHO, 2012).

These constructs are:

- 1) Perceived susceptibility: beliefs about chances of getting a condition
- 2) Perceived severity: beliefs about the seriousness of a condition and its consequences
- 3) Perceived benefits: beliefs about the effectiveness of taking action to reduce risk or seriousness
- 4) Perceived barriers: beliefs about the material and psychological advantages of taking action

- 5) Cues to action: factors that activate readiness to change
- 6) Self-efficacy: confidence in one's ability to take actions

The HBM has been adapted to explore a variety of long and short term health behaviors, including sexual risk behaviors (University of Twente, 2012). Patients with STIs who underwent counseling based on the HBM were significantly more likely to adopt protective behaviors and were less likely to acquire new STIs in the future (CDC, n.d). HBM theoretical considerations for understanding behaviors concerning STIs could enhance the development of questions for perception variables that adequately measure diverse aspects of how numerous factors affect perceptions and ultimately behaviors (Tyus, 2005). For this study, perceived susceptibility, perceived severity and perceived barriers are the HBM constructs that have been specifically chosen to guide research questions.

The concept of perceived severity speaks to an individual's belief about the seriousness of a health problem (Hayden, 2014). Knowledge about the health issue and beliefs about the difficulties a health issue would impact upon life quality drive perceived severity (Hayden, 2014). Perceived susceptibility, the belief that one is at risk for an STI, may motivate people to do something to prevent it from happening (Hayden, 2014). Conversely, decreased perception to susceptibility is linked to unhealthy behaviors (Hayden, 2014). Given that an individual sees the severity of HPV or HHV-8 and believes she or he is at risk of obtaining these infections, obstacles prevent adoption of healthier behaviors. Social factors, personal factors and institutional factors are three

types of barriers that hinder preventative action toward STIs (Chipiro-Mupepi, 2001). In Chipiro-Mupepi's study, lack of medical care, financial resources, lack of information and lack of encouragement were common barriers amongst women subjects to seek cervical cancer screening (2001). While the HBM is the most commonly used theory in health education, the individual constructs of the HBM are more descriptive than explanatory.

Knowledge of Human papillomavirus and Cervical Cancer

HPV is the most common sexually transmitted disease worldwide (Veldhuijzen et al., 2010). Almost every sexually active person will acquire HPV at some point in their lives, even if they have been sexually active with only one person (CDC, 2015). The life time risk for HPV infection is 80% with 90% of these infections clearing up without medical intervention within 2 years (Veldhuijzen et al., 2010). There are more than 100 strains of HPV and each type of infection can cause warts on different parts of the body (Mayo Clinic, 2014). These strains are divided into low-risk and high-risk genotypes (Chin'ombe et al., 2014). The low-risk genotypes of HPV cause development of genital warts (Veldhuijzen et al., 2010). Two of the high-risk HPV genotypes; 16 and 18 if left untreated, are associated with development of different kinds of cancer, including cervical and penile (Veldhuijzen et al., 2010). HPV genotypes 16 and 18 are responsible for 70% of cervical cancer cases globally (Veldhuijzen et al., 2010). Several research studies have established that infection of the cervix with high risk HPV genotypes is a cause of cervical cancer (Chin'ombe et al., 2014). This puts women at a much higher risk

than men for HPV infection (Veldhuijzen et al., 2010). Many HPV infected persons often do not realize they have been infected or if they do realize it, it is normally too late for effective treatment (Mayo Clinic, 2014). For HPV prevention, two vaccines have been created; Gardasil which protects against the HPV genotypes 16 and 18 and Cervarix which protects against cervical cancer but not genital warts (Mayo Clinic, 2014).

In Zimbabwe, the prevalence of high-risk HPV genotypes including 16 and 18 is 51% (Chin'ombe et al., 2014). Ninety-eight percent of women with cervical cancer studied in Zimbabwe had HPV DNA present with 59% of it being genotype 16 (Chin'ombe et al., 2014). Universally, factors such as early age of first intercourse, multiple sexual partners, poor genital hygiene, using oral steroid contraceptives, smoking, and infection with other STI pathogens predispose women to acquiring high-risk HPV (Chin'ombe et al., 2014). The onset for sexual activity in females in Zimbabwe is 15 years and is a common predisposing factor to HPV infection (Chin'ombe et al., 2014). Based on the HPV and related disease report by HPV Information Center (2015), cervical cancer screening practices and HPV vaccinations in Zimbabwe are minimal. Lack of adequate preventive and screening measures puts Zimbabwean women at a much higher risk compared to women of other countries. Even though some studies found that 98% of males and females in Zimbabwe had heard about an STI, lack of knowledge on HPV and CC is a significant factor in why this is an important health issue (Chadambuka et al., 2011). Zimbabweans lack knowledge on the link between HPV and CC. Mupepi and colleagues (2011) reported that 81% of rural women had no previous knowledge of

cervical screening tests. Given that HPV is directly connected to cervical cancer, it can be concluded that knowledge regarding CC is also extremely low.

Knowledge of Human Herpes-8 and Kaposi Sarcoma

HHV-8 is also known as Kaposi sarcoma associated herpes virus (KSHV) and is in the same family as the Epstein-Barr virus; the virus that causes infectious mononucleosis (American Cancer Society, 2014). Transmission of HHV-8 varies between the endemic and non-endemic geographical regions (Florek, Eilers & Armstrong, 2015). In low prevalence regions like North America and Western Europe, HHV-8 transmission is mainly from sexual activities (Florek, Eilers & Armstrong, 2015). In regions like sub-Saharan Africa with high prevalence for HHV-8, routes for HHV-8 infection are predominantly due to non-sexual contacts among family members and close contacts (Florek, Eilers & Armstrong, 2015). Saliva is the most common route for HHV-8 transmission in these regions (Pica & Volpi, 2007).

After infection, the HHV-8 virus enters lymphocytes where it lies in a latent state (American Cancer Society, 2014). This virus causes the cells to divide too much and live longer than it should, resulting in KS (American Cancer Society, 2014). HHV-8 is the primary causative factor in all types of KS (Cohen et al., 2005). Healthy people are normally asymptomatic of the virus' presence (American Cancer Society, 2014). However, immunosuppressed patients such as AIDS patients, cancer patients receiving

chemotherapy, and organ transplant patients, normally show symptoms in the form of skin lesions (American Cancer Society, 2014).

KS commonly localizes to the skin but may be found in other organs and tissues of the body (Cohen et al., 2005). KS on the skin usually starts as painless lesions of all types of sizes and shapes and eventually progress to plaque-like tumors (Cohen et al., 2005). There are four variants of KS named Classic KS, AIDS KS, African KS and Iatrogenic KS (Cohen et al., 2005). Classic KS is common in older people of Eastern Europe, Middle East and Mediterranean heritage (American Cancer Society, 2014). Lesions of Classic KS do not grow as quickly compared to other types of KS (American Cancer Society, 2014). AIDS-related KS, also called the epidemic KS, develops in people who are infected with HIV (American Cancer Society, 2014). This type was rarely diagnosed until HIV/AIDS became a global health issue (Chaabna et al., 2013). African KS, also known as endemic KS, occurs in people living in Equatorial Africa and was the most common type until the AIDS epidemic (American Cancer Society, 2014). This type is common in people 40 years old and younger (American Cancer Society, 2014). The last type is Iatrogenic KS also known as transplant-related KS (American Cancer Society, 2014). This KS develops in people whose immune systems have been suppressed after an organ transplant (American Cancer Society, 2014).

Zimbabwe is one of the countries that was hit the hardest by the AIDS epidemic (Borok, 2014). As of 2013, 1.5 million Zimbabweans were living with HIV (HIV & AIDS in Zimbabwe, 2015) and of these 1.5 million souls, 30% were co-infected with

HHV-8 putting them at risk for developing AIDS-KS (Borok, 2014). AIDS-KS is much more aggressive as compared to other types of cancers caused by HHV-8 (Radu & Pantanowitz, 2013). On a positive note, AIDS-KS can be controlled by the use of antiretroviral therapy for those with HIV (Radu & Pantanowitz, 2013). Despite the increased availability of antiretroviral therapy for HIV treatment, AIDS-KS in Zimbabwe remains the most common cancer among men, accounting for 20% of all cancers (Chokunonga et al., 2010).

Knowledge of HHV-8 has not been a focus of research in Zimbabwe, making it challenging for establishing background research information. However, from the 2010-11 Zimbabwe Demographic and Health Survey of young people aged 15-24, only 52% of women and 47% men surveyed showed comprehensive knowledge on HIV; a similar sexually transmitted infection (Zimbabwe National Statistics Agency & ICF International, 2012). The sample of this survey appropriately represented estimates at the national, urban-rural and provincial levels by interviewing 9,171 women aged 15-49, and 7,480 men aged 15-54 (Zimbabwe National Statistics Agency & ICF International, 2012). These findings suggest a low level of knowledge on HHV-8 and Kaposi sarcoma in Zimbabwe.

Perception of Risks

People infected with HPV and HHV-8 may not develop any signs and symptoms of the infections (CDC, 2014). A disease not showing any signs or symptoms may cause low perception of severity and misconceptions that it cannot be passed on to others. Lack

of knowledge and low perception of severity does not necessarily mean perception of susceptibility is low. A study among college aged women revealed that perceived severity of HPV infection indeed did not correlate with perceived susceptibility (Lopez & McMahan, 2007). Lopez and McMahan (2007) found that 83.1% of the female students surveyed perceived that contracting HPV infection would be severe; however, 84.4% did not feel susceptible to HPV infection. In addition, intervention programs have supported the finding that acquisition of general STI knowledge can influence views of perceived risk of STIs (Brouillette, 2013). Lack of knowledge among Zimbabwean young adults on HPV, HHV-8, CC and KS may lead to low perceptions of severity and susceptibility for these health problems. It is therefore important to understand if young adults in Zimbabwe perceive themselves at risk of HPV, HHV-8, CC and KS given that their knowledge of these conditions is very low.

In a comparative cross-sectional study done in Uganda on a population that had been vaccinated for HPV, the findings identified the perception of sexual risk for HIV and other STIs to be very low at 17.9% (Turiho, Muhwezi, Tumwesigye, Banura, & Katahoire, 2015). Another study conducted in Zimbabwe using a sample of 96 female patients going through anti-retro viral therapy for HIV/AIDS showed that 85% did not think all women were at risk of CC and 67% did not think they were individually at risk for CC (Pomerai, Mucike & Nyachowe, 2012). Similar results were found among a male college student sample of 735 at a large public university in the United States (Fontenot, Fantasia & Sutherland 2014). Ninety-three percent of this sample reported

they did not feel to be at risk for sexually transmitted infections (Fontenot et al., 2014). Such results show that the perception of sexual risk for STIs infection is low not only in Zimbabwe, but also in other countries.

Barriers to Screening

Zimbabwe has a three-tiered health system; traditional healers, prophets from “Churches of the Spirit,” and western medicine (Machinga, 2011). Of the three types, traditional healing is the most common, with an estimate of as many as 90% Zimbabweans utilizing this service (White & Dandurand, n.d). As of 2001, there were approximately 45,000 traditional healers in Zimbabwe alone, whereas the country only had 1,400 medical doctors (White & Dandurand, n.d).

Culturally, traditional healers are already a trusted source of health information and treatment among Zimbabweans (White & Dandurand, n.d). The level of high trust in traditional healing is dangerous because the healers do not possess any medical equipment or training to help identify infections of HPV or HHV-8. For treatment, traditional healers use divination, cleansing rituals, protective amulets and herbs (Machinga, 2011). A significant number of Zimbabweans believe that disease is caused by supernatural powers as a result of punishment (Machinga, 2011). Therefore, sickness is normally treated with only traditional healing rituals (Machinga, 2011). The Western medicine health system in Zimbabwe is predominantly run by the public sector both in rural and urban areas (Ministry of Health and Child Welfare, 2012). The private sector, which includes private for profit providers like general practitioners offices or private

hospitals and not-for-profit, like missionary hospitals, complements the public sector (Ministry of Health and Child Welfare, 2012). However, it is limited to those who can actually afford it (Ministry of Health and Child Welfare, 2012). Zimbabwe's Western style health delivery system was once one of the best amongst Sub-Saharan Africa (Ministry of Health and Child Welfare, 2012). However, this health system collapsed when hyper-inflation of 213 million percent between 2000 and 2009 caused public hospitals to temporarily close down as they ran out of medicines and skilled workers left the country to pursue better employment opportunities (Palitza, 2013). Regardless of the presence of western medicine in Zimbabwe, some hospital clinicians see a conflict between science and traditional practices (Machinga, 2011). In addition to a western medical facility visit, some hospital clinicians may suggest that patients visit traditional healers if they so wish (Machinga, 2011). As a result, Zimbabweans are dying from mostly preventable and treatable sexually transmitted diseases such as HIV and AIDs (Ministry of Health and Child Welfare, 2012).

If an individual is sexually active, getting tested for sexually related health issues is one of the most important behaviors to protect their health (CDC, 2014), regardless of having symptoms or not. "In the African tradition, people do not access healthcare checkups or screening because the concept of a checkup is not known and is not of common practice. Cervical cancer is preventable through early diagnosis of precancerous cells and early treatment (American Cancer Society, 2014). Instead, people tend to access

healthcare when they have disease symptoms” and is considered a later stage of cancer (Mupepi et al., 2011, p. 944).

In Zimbabwe, sixty-seven percent of its population resides in the rural areas (Zimbabwe National Statistics Agency and ICF International, 2012). With the majority of the population in the rural areas, the focus to lower CC needs to be there. In one study in the rural district of Shamva, 90.1% of females had never had cervical screening tests and 81% had never heard of cervical screening (Mupepi et al., 2011).

Mupepi and colleagues (2011) identified some of the barriers to cervical screening among Zimbabwean women to be the following:

- 1) Lack of knowledge about screening tests
- 2) Lack of advice and encouragement by health professionals
- 3) Monetary issues
- 4) No access to facilities offering screening
- 5) Low perception of risk
- 6) Husbands would not permit screening

The concept of gender roles, power and male dominance over females continues to contribute to the advancement of STI transmission (Mupepi et al., 2011). With the high percentage of people living in rural areas, many families find themselves in situations whereby the male figures leave their rural homes and go to urban areas looking for jobs. Because there are no provisions for family housing near these urban work sites, men often engage in extramarital sexual relations, increasing the risk of STIs like HHV-8

(Mupepi et al., 2011). Several studies reviewed for this study are in agreement that the most common barriers to any STI screening among the Zimbabwean population include embarrassment, lack of knowledge and awareness, attitudes, accessibility to adequate health facilities, lack of support, time, cost and cultural practices (Julinawati, Cawley, Domegan, Brenner & Rowan, 2013; Mupepi et al., 2011; Nyoni, 2008).

Summary

CC and KS remain a public health concern for Zimbabwe. HPV leads to CC and HHV-8 leads to KS. As compared to HIV/AIDS, there is very limited research done to this date on HPV and HHV-8 in Zimbabwe. Previous research focusing on Zimbabwe indicates that conclusively, there is a critical need to intensify mass education in Zimbabwe about the prevention of STIs. Young adults need to be targeted in order to inform them of the role of HPV and HHV-8 in development of CC and KS (Mupepi et al., 2011). Apart from lack of knowledge, barriers to receiving proper medical attention have been identified to be social, personal and institutional. There is a strong need for more research in Zimbabwe on the contributing factors to HPV and HHV-8 infection in the development of CC and KS.

CHAPTER THREE

METHODOLOGY

Introduction

The U.S. Department of Health and Human Services (n.d) reports that people with limited health literacy often lack knowledge about the body and causes of diseases. In order to reduce STI prevalence, we have to address STI knowledge which in turn impacts the health outcome of engaging in protected sexual behaviors (Abroso, 2013). This study intended to further examine knowledge, perception of risk, and perceived barriers to treatment of HPV and HHV-8 in its connection to CC and KS among college students at Africa University, Zimbabwe.

This chapter will describe the research design, participant selection, instrumentation, data collection, and data analysis. Data collection was contingent upon MNSU-Institution Review Board (IRB) and Africa University Research Ethics Committee (AUREC) approval. See Appendix A for MNSU IRB approval letter and Appendix B for AUREC approval letter.

Research Design

This study was implemented with a quantitative research design for a sample of students 18 years and older enrolled at Africa University, Zimbabwe during the January-May semester 2016. Due to the distance between the primary researcher and the selected participants, this method seemed most appropriate. Through use of statistical analysis, quantitative research measures how people think, feel or behave. This research

was intended to determine how students at Africa University think, feel and behave towards HPV and HHV-8. A questionnaire (Appendix C) was used to obtain information among students at AU pertaining their knowledge, perception of risk, and perceived barriers to treatment of HPV and HHV-8 in its connection to CC and KS. Data to answer the following questions were collected through a voluntary questionnaire.

1. What is the extent of the students' knowledge about HPV?
2. What is the extent of the students' knowledge about HHV-8?
3. Do the students perceive themselves to be at risk for HPV infection?
4. Do the students perceive themselves to be at risk for HHV-8 infection?
5. What are the perceived barriers to accessing medical attention and treatment for HPV infection?
6. What are the perceived barriers to accessing medical attention and treatment for HHV-8 infection?
7. Where do students obtain their knowledge on STI's?

Participants

The participants were female and male college students enrolled at Africa University, Zimbabwe during the January-May semester of 2016. The participants were

required to be 18 years of age or older in order to participate in this research. All participants voluntarily completed the questionnaire in person. No incentives were given to motivate the students to participate.

Instrumentation

Data were collected using a questionnaire specifically designed for this research. The questionnaire related to knowledge, perception of risk, and perceived barriers to treatment of HPV, HHV-8, cervical cancer and Kaposi.

The questionnaire consisted of seven sections focusing on different variables of the research. The first section had eight questions measuring perception of risk for HPV and HHV-8. The second section had six questions relating to perceived barriers preventing access to medical attention and treatment for HPV and HHV-8. The third section contained two questions which addressed whether prior to this study the participants had any knowledge of HPV and HHV-8. The fourth section, comprised of seven questions, which measured knowledge on HPV. The fifth section five had five questions measuring knowledge on HHV-8. The sixth section included two questions addressing the biggest concern for having unprotected sex and sources from which the participants received information on STIs. The seventh and final section had five (5) questions that measured participant's demographic characteristics. Please see Appendix C for a copy of the questionnaire used.

Validity and Pilot Test

For content validity, the questionnaire questions were evaluated by four faculty thesis committee members at Minnesota State University, Mankato.

After the questionnaire was validated, a pilot test was conducted to assess its usability. The pilot test was used as a formative tool to improve the questionnaire. The information collected from the pilot test was not used for research purposes. Five students at Africa University were asked to review the questionnaire and provide comments and suggestions of improvement. Based on the feedback from the pilot testing, no changes were warranted.

Data Collection

A copy of the consent form and questionnaire were sent via email to Co-principle investigator (Co-PI) Dr. M Machinga. One hundred and fifty copies of each were made and each questionnaire was given an identification number 1-150. Every month, Co-PI Dr. Mazvita Machinga facilitates workshops in Africa University that attract a very large student population. During the month of March, students 18 years and older who voluntarily attended the monthly health related workshops had the opportunity to participate in this research. Recruitment was conducted at the workshop before distribution of the consent forms and completion of surveys. At this workshop, the research purpose, risks and benefits were explained by Co-PI Dr. Machinga. Given this information, the potential participants were invited to participate in the research. The participating students were given five (5) minutes to consider whether or not to

participate in the study. There was no prior contact before this workshop with the potential participants. Each participant had adequate space around them as they completed the surveys to ensure privacy. Because this research presented no more than minimal risk of harm to subjects and involved no procedures for which written consent is normally required outside the research context, this study qualified for seeking waiver of document consent. Therefore consent was obtained but signed consent was not required.

The consent form and surveys were distributed and read out loud by Co-Pi Dr. Machinga. The participants were invited to voluntarily participate in the research study by completing the survey. Participants were informed that completion of the survey should not take more than 20 minutes of their time. Students who did not wish to participate were asked to stay in the room and submit their uncompleted surveys at the end of the data collection procedure. If needed, extra time to complete the survey was granted. The participants were asked to complete the survey honestly and to the best of their ability if they decided to partake in this study. At this point, any personnel affiliated with the study in this case being Dr. Machinga, left the room. The survey had direct instructions on how to record question responses. Everyone, regardless of whether they completed the survey or not, was asked to return the surveys to the front of the room in an envelope after at least a minimum of five minutes and, upon completion, they were asked to return to their seats. Following the submission of the surveys, if participants had further questions about the sexually transmitted infections, there was a health

professional available to answer them. In addition, participants were given the opportunity to visit the school clinic and counselling center for follow ups if need be.

Data Analysis

Data collected were inputted by Co-Pi Dr. M Machinga using IBM® SPSS® Statistics 23. A copy of the SPSS template specific to the questionnaire was constructed and sent to Dr. Machinga. After data input, these data were sent back to the primary researcher; Rujeko Machinga, for analysis.

CHAPTER FOUR

ANALYSIS AND INTERPRETATION OF DATA

Introduction

The purpose of this study was to assess the knowledge of HPV and HHV-8 in its connection to CC and KS, perception of risk, and perceived barriers to treatment among students at Africa University, Zimbabwe. The survey instrument for this study was composed of a paper questionnaire that consisted of seven sections. All data were analyzed using IBM® SPSS® Statistics 23. This chapter discusses findings obtained from the data analysis as it relates to each of the research questions and participants demographics.

Participants

The questionnaire was distributed to 130 female and male students enrolled in the January-May 2016 semester at Africa University, Zimbabwe. A sample size of 127 completed the questionnaire. All participants were required to be 18 years of age or older in order to participate in this research. All participants voluntarily completed the questionnaire in person without any incentive offered.

Participants' Demographic

The study sample gender distribution comprised of 33.6% ($n=41$) male and 66.4% ($n=81$) female students. The study sample was 54.5% ($n=66$) domestic students and 45.5% ($n=55$) international students. Participants' age ranged from 19 years old to 55 years old with a mean of 25 years old (7.42) ($n=115$). Twelve participants did not

respond to the age question. The field of study of the participants was distributed as Business Studies (BS) 0.8% ($n=1$), 11% Faculty of Health Science (FHS) ($n=14$), 42.5% Faculty of Humanity of Social Sciences (FHSS) ($n=54$), 29.9% Faculty of Management and Administration (FMA) ($n=38$), 3.1% Faculty of Education (FOE) ($n=4$), 7.1% Faculty of Theology (FOT) ($n=9$), 1.6% Institute of Peace, Leadership and Governance (IPLG) ($n=2$), 1.6% Media Studies ($n=2$), 1.6% Medical Lab ($n=2$). Marital status demographics were single 80.6% ($n=103$), married 17.7% ($n=22$), widowed 0.8% ($n=1$) and divorced 0.8% ($n=1$).

Research Questions Findings

What is the extent of the students' knowledge regarding HPV?

Two participants did not respond to this question. Of the one hundred and twenty-five respondents, 32.0% ($n=40$) had heard of HPV prior to the questionnaire, 44.0% ($n=55$) had not heard of HPV prior to the questionnaire and 24% ($n=30$) were not sure if they had heard of HPV prior to this questionnaire.

Quantitative analysis was conducted to determine the study sample's general knowledge of HPV. HPV knowledge scores were recoded based on correct answers. A score of five (5) was given for every correct answer, a score of one (1) was given for every wrong answer and a score of zero (0) was given for answers of "I do not know." Using recoded data, knowledge scores were computed. Maximum possible score which reflected highly knowledgeable for HPV was 30. The lowest possible score which

reflected no knowledge of HPV was 0. The mean score was 8.66 (7.98). Table 4.1 illustrates these scores. Only questions reflected in table 4.1 were used.

What is the extent of the students' knowledge regarding HHV-8?

Three students did not respond to this question. Of the one hundred and twenty-four respondents, 35.5% ($n= 44$) had not heard of HHV-8 prior to the questionnaire, 37.9% ($n=47$) had heard HHV-8 prior to the questionnaire, 37.9% ($n=47$) had heard of HHV-8 prior to the questionnaire and 24% ($n=30$) were not sure if they had heard of HHV-8 prior to this questionnaire.

Descriptive analysis was conducted to determine the study sample's general knowledge on HHV-8. Knowledge scores were recoded based on correct answers. A score of five (5) was given for every correct answer, a score of one (1) was given for every wrong answer and a score of zero (0) was given for "I do not know" responses. Using recoded data, knowledge scores were computed. Maximum possible score which reflected highly knowledgeable for HHV-8 was 25. The lowest possible score which reflected no knowledge of HHV-8 was zero (0). The mean was 5.72 (5.83). Table 4.1 illustrates these scores.

Table 4.1

Knowledge scores on HPV and HHV-8

	N	Minimum	Maximum	Mean	Std. Deviation
Knowledge on HPV	116	0.00	30.00	8.6638	7.97599
Knowledge on HHV-8	123	0.00	25.00	5.7236	5.82856

Do the students perceive themselves to be at risk for HPV infection and do students perceive themselves to be at risk for HHV-8 infection?

Frequency data analysis was used to determine the perception of risk for HPV and HHV-8 infection among the students. Table 4.2 illustrates the findings. Forty-seven point two percent ($n=58$) of the participants believed engaging in sex was putting themselves at risk for STIs, 26.0% ($n=32$) believed engaging in sex put them moderately at risk for STIs, 6.5% ($n=8$) believed engaging in sex put them at a slight risk for STIs and 20.3% ($n=25$) believe were not at all at risk for STIs when they engaged in sex.

Table 4.2

Perceived risk for HPV and HHV-8 infection

Statement	Not at all %(n)	Slightly %(n)	Moderately %(n)	Extremely %(n)
Every time I engage in sex, I put myself at risk for STIs	20.3(25)	6.5(8)	26(32)	47.2(58)
Having many sexual partners increases my risk of getting STIs	12.2(15)	5.7(7)	3.3(4)	78.9(97)
I am worried about contracting HPV	23.8(29)	11.5(14)	22.1(27)	42.6(52)
HHV-8 (Herpes) is a serious health condition	15.9(18)	8.8(10)	23.9(27)	51.3(58)
I am worried about contracting HHV-8 (Herpes)	33.6(38)	10.6(12)	18.6(21)	37.2(42)
I am at risk for contracting HPV if my partner has no visible symptoms	14.4(17)	17.8(21)	22.9(27)	44.9(53)
HPV is a serious health condition	13.8(17)	3.3(4)	15.4(19)	67.5(83)
I am at risk of contracting HHV-8 (Herpes) if my partner has no physical symptoms	22.3(27)	15.7(19)	16.5(20)	45.5(55)

What are the perceived barriers to accessing medical attention and treatment for HPV and HHV-8 infection?

Frequency analysis was used to determine the barriers preventing sampled students from accessing medical attention and treatment for HPV and HHV-8 infections. Of the study sample, 83.5% ($n=101$) wanted to know their STI status which made it not a barrier, 24% ($n=29$) identified financial issues as a barrier, 52.9% ($n=64$) stated that access to medical facilities was a barrier, 22.6% (28) identified the society and its stigma as a barrier, 11.4% ($n=14$) recognized their significant other as a barrier and 36.3% ($n=45$) identified lack of knowledge on STIs as a barrier. Table 4.3 further explains other responses.

Table 4.3

Perceived barriers to accessing medical attention and treatment for HPV and HHV-8

Statement	Yes %(n)	No %(n)	Not Sure %(n)
Financial issues have prevented me from getting tested for STIs	24(29)	54.5(66)	21.5(26)
If infected with any STI, I would want to know my status	83.5(101)	6.6(8)	9.9(12)
I have access to places where I can be tested for STIs	52.9(64)	23.1(28)	24(29)
The society and its stigmas may prevent me from getting tested for STIs	22.6(28)	51.6(64)	25.8(32)
My significant other does not support any type of STI testing	11.4(14)	60.2(74)	28.5(35)
Lack of knowledge on STIs has hindered me from being tested	36.3(45)	44.4(55)	19.4(24)

Where do students obtain their knowledge on STI's?

Source of STI information was examined using frequency analysis. Among the participants, 33.9% ($n=49$) received STI information from friends and family, 14.2%

($n=18$) received STI information from their general practitioner, 18.1% ($n=23$) from the New Start Center, 14.2% ($n=18$) from family planning clinic outlets, 15.1% ($n=19$) from Africa University clinic, 40.9% ($n=52$) from hospitals, 44.9% ($n=57$) from the Internet, 18.9% ($n=24$) from the newspaper, 18.1% ($n=23$) from the television and 10.2% ($n=13$) from unidentified sources. Table 4.4 summarizes the findings.

Table 4.4
*Source of STI
information*

Source	%(n)
Internet	44.9(57)
Hospitals	40.9(52)
Friends and Family	33.9(49)
Newspaper	18.9(24)
New Start Center	18.1(23)
Television	18.1(23)
Africa University Clinic	15.1(19)
Family Planning Clinic Outlets	14.2(18)
General Practitioner	14.2(18)
Other	10.2(13)

Further Analysis of Data

An independent T-test was conducted in order to determine whether or not a significant difference existed regarding knowledge of HPV and knowledge of HHV-8 among the different genders. Female participants mean knowledge scores for HPV was 9.77 (8.50) while males was 6.70 (6.57). Results showed a $t = -2.101$ ($df=86.732$) and

$p=.039$. A t-test for knowledge scores on HHV-8 showed no significant difference for males and females.

A frequency analysis indicated that, if they do not use protection for sex, 2.7% ($n=3$) considered HPV as their biggest concern, 4.5% ($n=5$) were most concerned about their reputation, 1.8% ($n=2$) were most concerned about HHV-8, 17.0% ($n=19$) were most concerned about pregnancy, 65.4% ($n=83$) were most concerned about HIV/AIDS.

Figure 1 illustrates these findings.

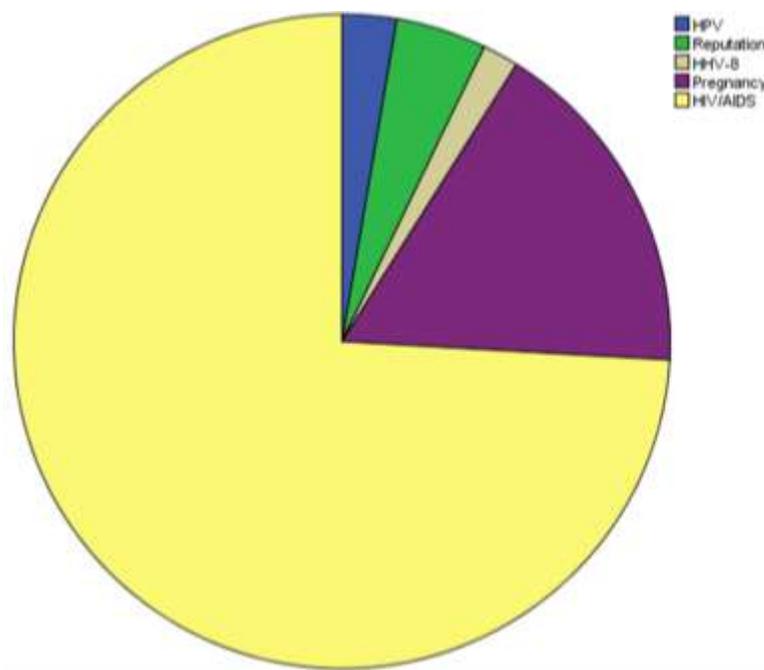


Figure 1. The biggest concern when engaging in unprotected sex.

Summary of Research Questions Findings

The purpose of this study was to assess the knowledge of HPV and HHV-8 in its connection to CC and KS, perception of risk, and perceived barriers to treatment among

students at Africa University, Zimbabwe. One hundred and thirty questionnaires were distributed. One hundred and twenty-seven questionnaires were completed and three (3) participants chose not to complete the survey. It is important to note that in this study there were unequal sample sizes for the questions due to some missing information. However, valid percentages were reported in this study accommodating this.

Knowledge of HPV and HHV-8

Prior to this research, 32.0% of the study sample had heard about HPV and 37.9% had heard about HHV-8. A mean knowledge score on HPV of 8.66 (7.98) out of 30 and a mean knowledge score on HHV-8 of 5.72 (5.83) out of 25 was reported.

Females had a mean HPV knowledge score of 9.77 (8.50) while males had a mean score of 6.70 (6.57). Females had a mean HHV-8 knowledge score of 6.0 (5.90) while males had a mean score of 5.6 (5.85).

Perception of risk for HPV and HHV-8 Infection

The study sample (47.2%) believed engaging in sex put them at risk for STIs. Fifty-one point three percent believed HHV-8 was a serious health condition and 67.5% believed HPV was a serious problem.

The responses on the questionnaire about the participants' biggest concern for engaging in unprotected sex was reflected in the finding that 65.4% were most concerned about HIV/AIDS.

Perceived barriers to accessing medical attention and treatment for HPV and HHV-8 infection

If infected by an STI, 83.5% of the study sample wanted to know their status. Fifty-two point nine percent noted that they had access to places where they could be tested. Thirty-six point three percent identified lack of knowledge on STIs as a barrier to not being tested.

Source of STI information

Study sample responses from the questionnaire section on sources of information showed that 44.9% got their STI information from the Internet, 40.9% got it from the hospitals and 33.9% got it from friends and family

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

Introduction

CC and KS remain the most common cancers among women and men, respectively, in Zimbabwe. The risk factors for both of these cancers; HPV and HHV-8, are not as common among Zimbabweans as other STIs such as HIV. This study aimed to assess if the college-aged population in Zimbabwe had adequate knowledge on HPV and HHV-8. This study also aimed to identify the perceptions of risk of being infected with HPV and HHV-8, the perception of barriers to seeking appropriate medical attention when infected with STIs, and the source of information on STIs among the college-aged population in Zimbabwe. A study sample was selected from a private post-secondary institution of Africa University, Zimbabwe to represent the target population of young adults. Using a written questionnaire for data collection, it was concluded that sampled students:

- 1) Lack knowledge of HPV and HHV-8
- 2) They perceive themselves to be at risk for HPV and HHV-8 infection
- 3) Lack of knowledge hinders them from seeking medical advice on STIs
- 4) The Internet and hospitals are the most used sources for STIs information

In this chapter, a summary and discussion of the findings will be done. In addition, conclusions and future recommendations, based on the findings, will be offered.

Discussion and Conclusion

Based upon these findings, it was concluded that before this research study our respondents had not heard about HPV (44.0%) or were not sure if they had heard about it before (24.0%). Almost an equal amount of our respondents had heard (37.9%) and not heard (35.5%) about HHV-8. However, 26.0% respondents were not sure if they had heard about HPV prior to this research study. The placement of these questions on prior knowledge could have influenced the responses since they were placed in the middle of the questionnaire, following other HPV and HHV-8 related questions. As result, this question placement may have brought confusion to the respondents for them to give a direct yes or no answer. Knowledge scores findings clearly indicated a lack of knowledge on HPV and HHV-8 among sample group of students in Zimbabwe. The knowledge percentage score for correct answers about HPV is extremely low being 28.9%. These findings support a statement by Chin'ombe and colleagues that public knowledge of HPV is still lacking in Zimbabwe (2014). The HHV-8 knowledge percentage for correct answers is 22.9%. This percentage is also extremely low. Not surprisingly, given that there is a very limited amount of information on HHV-8 in Zimbabwe, these findings are valid. Further analysis findings indicated that there is a significant difference between males and females' knowledge of HPV, with female scores being significantly higher. There was no significant difference in male and female participants' knowledge of HHV-8. Given that HPV is predominantly associated with cervical cancer, it was expected that women would be more knowledgeable as CC directly impacts them. There was no

significant difference in lack of knowledge on HHV-8 between females and males. There was a large number of the participants who responded that they did not know an answer to the knowledge questions on HPV and HHV-8. This reflected honesty and reliability.

The findings on perception of risk to HPV and HHV-8 infection were unexpected. Alternatively, the findings reflected positively for the community in Zimbabwe as it pertains to perception of risk. The findings suggest that lack of knowledge does not necessarily equate to low perception of risk and low perception of severity as anticipated. Regardless of the lack of knowledge on HPV, 82.9% moderately and extremely believed HPV was a serious health condition. Likewise, regardless of the lack of knowledge on HHV-8, 75.2% believed HHV-8 was a serious health condition. In addition, lack of knowledge on STIs did not prevent the study sample from believing that every time they engage in sex it put them at risk for an infection. A total of 73.3% moderately and extremely believed any engagement of sex; protected or not, put them at risk for STIs. On the contrary, when asked to select their biggest concern for engaging in unprotected sex, HIV/AIDS was the most common at 66.9%. HPV was the biggest concern for 3.1% and HHV-8 was a concern for 3.1%. Zimbabwe is one of the countries most affected by HIV/AIDS epidemic. Students are more likely to be exposed to HIV/AIDS than any other STI. Adult prevalence of HIV in Zimbabwe is 15% (Zimbabwe AIDS Response Progress Report, 2014). An estimated 1.4 million adults aged 15 years and older are currently living with HIV/AIDS in Zimbabwe; a 13 million population country (UN AIDS, 2014). As a result of this high statistic, being surrounded by HIV/AIDS is a norm on a daily

basis. The government of Zimbabwe has developed numerous policies that allow for HIV/AIDS prevention education and treatment resulting in a reduced rate of incidence and prevalence in the past decade. Therefore, increased exposure to information about HIV/AIDS may skew perceptions of risk to STIs in general.

When it comes to perceived barriers to accessing medical attention and treatment for HPV and HHV-8 infection, the findings were unanticipated. It is very rare to find free medical services in Zimbabwe. Majority of the medical facilities require cash before any sort of screening or treatment. Given that 72.3% of Zimbabwe's population is below the national poverty lines, anticipated monetary issues were anticipated to be a barrier to seeking professional medical attention (World Bank, 2016). It was very surprising that 52.0% of the study sample indicated financial issues as not a barrier. The more someone knows about something, the more likely they are to do something about it. This concept was proved correct with at least 55.7% sampled students feeling they were not sure and felt that their lack of knowledge on STIs hindered them from being tested. However, lack of knowledge did not prevent the sampled students from wanting to know their status. An astounding 83.5% sampled students wanted to know of their status if they were infected. In public health, specifically, when dealing with STIs, the foundation for prevention and treatment is to get tested (CDC, 2014). Knowing their status will allow for early diagnosis if it applies and prevent them from infecting others. As a health educator, the next question is that given the sampled students actually want to know their status, are there facilities to provide these services to them? This study, in accordance with other

studies, has revealed that facilities that deal with STIs in Zimbabwe are available. In efforts to fight the HIV/AIDS epidemic, there has been success in public health focus to increase and improve on facilities that address STIs. This study showed that 52.9% sampled students felt they had access to STI testing facilities. In accordance, the Demographic and Health Survey of 2010/11 reports that 91% of women and 88% of men knew where to access STI testing services (Zimbabwe National Statistics Agency & ICF International, 2012). Last but not least, all the efforts to stop HIV/AIDs have also resulted in less stigmatization of this health condition. This study sample showed that 51.6% did not consider the society and its stigmas as a barrier to getting tested as anticipated. This study also indicated that only 3.1% of the sampled students were concerned about their reputation. HIV being in the same category as HPV and HHV-8, clearly many people are more willing to power through any stigmatization and seek screening and treatment if need be. However, the study sample surveyed are students who voluntarily attended a health related workshop. This study sample may be less stigmatized by society and consequently may not reflect the general attitude on society and its stigmas of the population as a whole.

The last part of the questionnaire used for data collection asked from what sources the sampled students obtained their STI information. Among the ways of getting STI information, the Internet was the most common choice, with 44.9% identifying it as a source of their information. The next most popular source of information were the hospitals with 40.9% identifying it as their source of information. A not for profit

organization identified as the New Start Center that focuses on family planning and reproductive health, STIs and Tuberculosis, was not a common source of information with only 18.1% stating they got their information from there. Along with the New Start Center, another less common source of information was the general practitioner. About 85.8% of the study sample did not get their STI information from a general practitioner. These findings may be a reflection of the society's norms. In Zimbabwe, the majority of the population prefer to seek medical help at hospitals as opposed to a general practitioner. General practitioners are generally available at private for profit facilities and their initial consultation fees are elevated as compared to a consultation at a public hospital (IRIN News, 2014). It is also important to take note that health insurance exists in Zimbabwe but, not all can afford it. However, having health insurance does not guarantee immediate health call service. Most of the hospitals and private practice general practitioners require that cash is paid up front and then the health insurance company will reimburse. Generally, most will opt for the public hospitals since they are indeed much cheaper.

It was very alarming to find out that the sampled students did not get much of their STI information from the school clinic. Only 15.1% identified the Africa University clinic as a source of information. Many students may not feel comfortable visiting the school's clinic with a fear of being noticed by others since it is located on campus. These findings might reflect a need for special attention to anonymity when seeking STI information.

To conclude, the findings from this study were based on a small, non-random, sample, and attempts to represent the general college-aged population in Zimbabwe. The pilot test for this questionnaire was conducted in efforts to only assess readability and usability; which was a limitation. However, information from this study is a great initial point for further investigations on knowledge of HPV and HHV-8, perceived risks of HPV and HHV-8 infection, perceived barriers to accessing health facilities and the sources of STI information..

Recommendations

Based on the findings of this study, further recommendations, that will hopefully initiate some direction for further research and health education practice, will be addressed. The general theme identified by data analysis is that the college-aged population in Zimbabwe, as represented by sampled students at Africa University, is not knowledgeable on HPV and HHV-8. However, participants were knowledgeable about their risk and are willing to address these health issues. Having access to facilities that deal with STIs in Zimbabwe, as indicated by respondent's survey responses, reflects a positive trend. However, these findings could be different in the rural area. As of 2015, 67% of the Zimbabwean population resided in the rural areas and health facilities in rural areas are not as voluminous as in the urban areas (Zimbabwe National Statistics Agency and ICF International, 2012). It is very clear what the focus for health education practice in Zimbabwe needs to be and that there is a need for further research on HPV and HHV-8 in order to gain a better perspective on the issues.

Health Education Practice Recommendations

I acknowledge the great work the Ministry of Health and Child Care in Zimbabwe has done thus far to control the epidemic of HIV/AIDS. However, there is a major need to continue addressing other STIs like HPV and HHV-8. Based on this research findings, the best way to reach out to the college-aged about HPV and HHV-8 is through the hospitals. Educational programming on HPV and HHV-8 needs to be administered at local hospitals and clinics since respondents indicated that this is their favored source of information. When discussing CC, HPV should be emphasized so that this population is aware that this cancer can be prevented. In addition, given the discrepancy between female and males regarding their knowledge on HPV, it will be beneficial for any HPV related educational programs to focus upon males and females equally. This can be achieved by tailoring any educational materials specifically toward each gender and using practice-orientated messages. Even though it is highly associated with CC, HPV is a virus that not only affects women. When it comes to HHV-8, the same applies. Health educators should take note that prevention methods for HHV-8 infection are not as direct like HPV infection prevention methods. “Recommendations related to preventing exposure to HHV-8 do not exist; screening patients for HHV-8 serostatus and recommending behavioral modifications based on such information is not likely to be highly effective, has not been validated, and is not currently recommended” (National Institutes of Health [NIH], 2013, p. O-17). Given that HHV-8 is a strong risk factor for KS development especially in HIV infected individuals, early initiation of antiretroviral

therapy is likely to be the most effective measure for the prevention of KS (NIH, 2013). Therefore, an angle to consider when tackling this health problem is integrating HIV infection prevention and treatment methods into HHV-8 education information.

It can be very challenging to convince this age group to attend health programs or activities that the school clinic may implement. An effective way for the Africa University clinic and public health team to overcome this barrier maybe reaching out to the students through their peers. Using college-aged peers to present educational programs on HPV and HHV-8 could reach out to the targeted audience in an effective manner as compared to older adult staff from the school clinic. A passive approach of sharing HPV and HHV-8 messages is a great way to reach out to the students in a non-human interaction. Teaching materials or aids like take home pamphlets, flyers, posters and billboards could help solve the lack of knowledge issue and lack of participation problems. These suggested ways are very time efficient, inexpensive and very effective as compared to running direct human interaction programming that many students may not attend. A lot of time needs to be put into developing this material so that information is specifically tailored to impact students based on their culture, gender, age, sexually activity, marital status, and religiosity The more the educational materials are tailored to specific audiences, the more likely the material will be actually read and the participants will be engaged. Given that students at Africa University have access to the Internet and all have school emails, sending out education information through emails is a great passive approach that could reach an entire student body at once. Sexually related topics

are very sensitive issues to address. For the Africa University clinic efforts, a suggested active learning approach would be direct human interaction through poster presentations or having booths in areas heavily populated by students. At these tabled presentations or booths, the health education team made up by trained peers, can distribute any of the educational communication materials created to address these issues. In addition, they can have 2-minute educational conversations covering information that will trigger interest in students to want to find out more. Great locations to consider for these interventions are in residence halls, in front of the dining hall, in the student union, on the campus courtyard, at athletic games, or at school sponsored night activities. Another effective active approach could be reaching out to the students through facilitating small scale workshops that address the specific issues on HPV and HHV-8. Something that does not require a lot of money but a considerable amount of time, are health talks. Small group gatherings (10-20 per group) for students will be very beneficial to not only increase knowledge on HPV and HHV-8, but to also address comfort with the topic. In this study, 33.9% of students sampled reported learning STI information through their family and friends. Therefore, as much as the school clinic and public health team would like to reach out to a large school population directly at once, focusing on smaller groups may be much more effective. The hope will be to have these smaller groups participants eventually become peer educators. Given all this, it is highly recommend that the Africa University health team collaborates with a wide range inter-disciplinary campus communities, especially faculty and administrative offices in implementing health

educational programs. Faculty has informal interaction with students on a daily basis. Involving them in educational programming will be a great way to reach out to the students who normally would not attend other programming.

The HBM identifies perceived susceptibility, perceived risks, perceived benefits, perceived severity, and perceived barriers as predictors of safer sexual activity (University of Twente, 2012). The construct of self-efficacy defined as having confidence in one's ability to perform a particular behavior also plays a vital role in STI prevention behaviors such as using condoms and limiting the number of sexual partners (Sychareun, Thomsen, Chaleunvong & Faxelid, 2013). The problem with the college-aged population in Zimbabwe is not that they do not feel negative conditions can be avoided or that they do not believe they can successfully take a recommended health action. This population is very much aware that they are at risk and are open to knowing their status, which could lead to the control of HPV and HHV-8 transmission. Perceived sexual norms through permissive sexual norms on sexual behaviors should also be considered as a significant determinant of the spread of STIs (Sychareun, Thomsen, Chaleunvong & Faxelid, 2013). University of Twente states that "The Health Belief Model is based on the understanding that a person will take a health-related action if that person:

- 1) feels that a negative health condition can be avoided
- 2) has a positive expectation that by taking a recommended action, he/she will avoid a negative health condition

- 3) believe that he/she can successfully take a recommended health action” (n.d, para. 2).

Given this information, any health education material or programming should focus on facts (ways of transmission, who is affected, treatment) about HPV and HHV-8, ways one can avoid being infected and infecting others, and an action plans if infected. As health educators, it is important to keep in mind that even though students know they are at risk, some may still participate in activities that put them at risk for STIs. However, it is our role to educate the population so that they have a positive expectation incorporating healthy behaviors to minimize their risk of HPV and HHV-8 infection.

Finally, HPV complete vaccine series has proved to have 90% efficacy in preventing strains 16 and 18 HPV infections (Cutts., et al, 2007). It is recommend that the Ministry of Health and Child Welfare facilitates HPV vaccination programs throughout the country. These vaccination programs should be for both males and females and be administered before puberty. For those past puberty, the HPV vaccination is still recommended.

Further Research Recommendations

Searching for background literature on HPV and HHV-8 was very difficult. The limited amount of research available on HPV is dominated by focus on cervical cancer. When it comes to HHV-8, there is barely any available information on it. It is with strong recommendation that further studies on HPV and HHV-8 are conducted in Zimbabwe.

This study was conducted on a limited time line, with no funding, and with a small study sample. Future efforts may look at doing a similar study with multiple other post-secondary institutions so that the findings can better represent the college-aged population in Zimbabwe. During this study, there was a lot of interest from staff and faculty to want to participate as they also did not know much about HPV and HHV-8. Given that faculty spends more time with students, it will be beneficial to also assess their knowledge and view their perspective in order to find ways to help them help the students.

The location of this study was in an urban area. It will be beneficial for future studies to consider expanding their horizons to college-aged adults in rural areas though they may not be pursuing post-secondary education. In addition, further research should consider studying knowledge on CC and KS as it will give a broader view on what the targeted audience knows and thinks.

Finally, cervical cancer and Kaposi sarcoma are health issues that affect the population at Zimbabwe at large. Further research should expand the target population from college-aged. The next step is to figure out how the entire 15 years and older population views HPV and HHV-8. This way it may be possible to make conclusions that will guide the public health sector of Zimbabwe. The more the health educators in Zimbabwe know about what the general population knows and thinks on HPV and HHV-8, the more they can know how to help and reduce CC and KS incidences.

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APPENDICES

Appendix A

Minnesota State University, Mankato

Institutional Review Board

Approval of Study



March 1, 2016

Dear Dawn Larsen, PhD:

Re: IRB Proposal entitled "[864904-4] Human Papillomavirus and Human Herpesvirus-8: Knowledge, perception of risk and barriers to screening and treatment among students at Africa University, Zimbabwe."

Review Level: Level [I]

Your IRB Proposal has been approved as of March 1, 2016. On behalf of the Minnesota State University, Mankato IRB, we wish you success with your study. Remember that you must seek approval for any changes in your study, its design, funding source, consent process, or any part of the study that may affect participants in the study. Should any of the participants in your study suffer a research-related injury or other harmful outcome, you are required to report them to the Associate Vice-President of Research and Dean of Graduate Studies immediately.

The approval of your study is for one calendar year less a day from the approval date. When you complete your data collection or should you discontinue your study, you must submit a Closure request (see <http://grad.mnsu.edu/irb/continuation.html>). All documents related to this research must be stored for a minimum of three years following the date on your Closure request. Please include your IRBNet ID number with any correspondence with the IRB.

Sincerely,

A handwritten signature in cursive script that reads "Mary Hadley".

Mary Hadley, Ph.D.
IRB Coordinator

A handwritten signature in cursive script that reads "Sarah Sifers".

Sarah Sifers, Ph.D. LP
IRB Co-Chair

A handwritten signature in cursive script that reads "Julie A. Carlson".

Julie Carlson, Ed.D.
IRB Co-Chair

Appendix B
Africa University Research Ethics Committee

Approval Letter



INVESTING IN AFRICA'S FUTURE

AFRICA UNIVERSITY RESEARCH ETHICS COMMITTEE (AUREC)

P.O. BOX 1320, MUTARE, ZIMBABWE • OFF NYANGA ROAD, OLD MUTARE • TEL: (+263-20) 80075/80026/61811 • E-MAIL: aurec@africau.edu • WEBSITE: www.africau.edu

Ref: AU009/16

January 21, 2016

Rujeko O. Machinga
111 Carkoski Commons
Mankato MN 56001
USA

RE: Human Papillomavirus and Human Herpesvirus-8: An assessment of perception of risk and barriers to screening and treatment for sexually transmitted infections among students at Africa University, Zimbabwe.

Thank you for the above titled proposal that you submitted to the Africa University Research Ethics Committee for review. Please be advised that AUREC has reviewed and **approved** your application to conduct the above research. However it is important that you address the comments below before implementing your research study:

1. Outline plan for feed back of research findings to participants.

The approval is based on the following.

- a) Research proposal
- b) Questionnaire
- c) Informed consent form

- **APPROVAL NUMBER** AU009/16
This number should be used on all correspondences, consent forms, and appropriate documents.
- **APPROVAL DATE** January 21, 2016
- **EXPIRATION DATE** January 20, 2017
- **TYPE OF MEETING** Expedited

After the expiration date this research may only continue upon renewal. For purposes of renewal, a progress report on a standard AUREC form should be submitted a month before expiration date.

- **SERIOUS ADVERSE EVENTS** All serious problems having to do with subject safety must be reported to AUREC within 3 working days on standard AUREC form.
- **MODIFICATIONS** Prior AUREC approval is required before implementing any changes in the proposal (including changes in the consent documents)
- **TERMINATION OF STUDY** Upon termination of the study a report has to be submitted to AUREC using standard form obtained from.

Yours Faithfully

MITI G.P. AUREC Programmes Officer
FOR CHAIRPERSON, AFRICA UNIVERSITY RESEARCH ETHICS COMMITTEE (AUREC)



Appendix C

Questionnaire

“Knowledge, perception of risk and barriers to screening and treatment on Human
Papillomavirus and Human Herpesvirus-8”

MNSU IRB NetID: 8649041

AUREC ID: AU009/16

THANK YOU FOR YOUR WILLINGNESS TO PARTICIPATE**Please put an X on what best applies to you**

	Not at all	Slightly	Moderately	Extremely
Every time I engage in sex, I put myself at risk for STIs				
Having many sexual partners increases my risk of getting STIs				
I am worried about contracting HPV				
HHV-8 (Herpes) is a serious health condition				
I am worried about contracting HHV-8 (Herpes)				
I am at risk for contracting HPV if my partner has no visible symptoms				
HPV is a serious health condition				
I am at risk of contracting HHV-8 (Herpes) if my partner has no visible symptoms				

	Yes	No	Not Sure
Financial issues have prevented me from getting tested for STIs			
If infected with any STI, I would want to know my status			
I have access to places where I can be tested for STIs			
The society and its stigmas may prevent me from getting tested for STIs			
My significant other does not support any type of STI testing			
Lack of knowledge on STIs has hindered me from being tested			

Please put an X for your answer

	Yes	No	Not Sure
Prior to this survey, I had heard of Human Papillomavirus (HPV)?			
Prior to this survey, I had heard of Human Herpes Virus-8 (HHV-8)			

**** Please note change of response****

	TRUE	FALSE	I do not know
HPV can only be passed through sexual intercourse			
HPV can lead to cervical cancer			
Condoms fully protect from HPV			
Men cannot get HPV			
Most sexually active people will get HPV at some point in their lives even if they are intimate with only one partner			
HPV can affect a woman's ability to get pregnant			
There is a vaccine for HPV			

MNSU IRB Net ID: 8649041

AUREC ID: AU009/16

	TRUE	FALSE	I do not know
HHV-8(Herpes) can only be passed through sexual intercourse			
Non sexual contact like blood or saliva can pass HHV-8 (Herpes)			
ARVs used to control HIV/AIDS can be used for HHV-8 (Herpes)			
HHV-8 (Herpes) can lead to Kaposi Sarcoma			
HHV-8 is only found in people with AIDS			

****Please circle the correct answer****

What is your biggest concern of consequence as a result of unprotected sex?

- a. HPV
- b. Reputation
- c. HHV-8
- d. Pregnancy
- e. HIV/AIDS

Information on STI's

1. Thinking of information concerning STIs in general, which of these are the main sources of information you normally use to find out about such issues? Select all that apply.

- My friends or family
- My General Practitioner
- The New Start Center
- Family Planning Clinic Outlets
- Africa University Clinic
- Hospitals
- The internet
- Newspaper
- Television
- Other ways: Please state

Sex (check one): Male _____ Female _____ Other (please state) _____

Age (In years): _____ Field of Study: _____

Marital Status (check one): Single _____ Married _____ Divorced _____ Widowed _____

International Student: Yes _____ No _____

THANK YOU FOR YOUR TIME TO FILL OUT THIS SURVEY. I LOOK FORWARD REFLECTING ON

Appendix D
Consent Form

Consent Letter to Participants in Research Study

Dear Student,

My name is Rujeko O. Machinga and I am a graduate student in the Health Science department at Minnesota State University, Mankato. My research is titled Human Papillomavirus and Human Herpesvirus-8: Knowledge, perception of risk and barriers to screening and treatment for sexually transmitted infections among students at Africa University, Zimbabwe. This research will attempt to identify knowledge and perception of risk of Human Papillomavirus and Human Herpesvirus-8 as the primary risk factors to cervical cancer and Kaposi sarcoma respectively. This study will also address what the perceived barriers to treatment and screening for sexually transmitted infections are among the students at Africa University, Zimbabwe; a representation of young adults in Zimbabwe.

You are invited to participate in this research study which will be administered by Dr. Mazvita Machinga. If you agree to participate, this survey assesses your knowledge and perception of risk on HPV and HHV-8 and if any, the barriers to screening and treatment of sexually transmitted infections. All of your responses will be kept confidential, and can be viewed only by authorized research staff members; Rujeko Machinga, Dr. Dawn Larsen, Dr. Autumn Hamilton, Dr. Marge Murray-Davis, Dr. Judith Luebke and Dr. Mazvita Machinga. The survey takes about 10-20 minutes to complete.

Participation in this project is voluntary and you have the right to stop at any time without penalty or loss of benefits. Your decision whether to participate will not affect your relationship with Minnesota State University, Mankato or Africa University, Zimbabwe. There are no direct benefits to you as a result of participation in this research but your feedback will help us identify areas of focus on this health problem in Zimbabwe.

None of your answers will be released and no names will be recorded other than on this form, which will be kept separate from your survey responses. The risks of participating in this study are about the same as are encountered in daily life. For future reference of this consent form, you may keep the copy handed out to you.

If you have any questions regarding the research, please contact me via email at rujeko.machinga@mnsu.edu, Dr. Larsen at dawn.larsen@mnsu.edu or Dr. Machinga at machingam@afriau.edu. If you have any questions or concerns regarding participant's rights or research related injuries please contact the Minnesota State University, Mankato Institutional Review Board Administrator, Dr. Barry Ries, at 507-389-1242 or at barry.ries@mnsu.edu and mention research IRBNet ID 8649041.

Submitting the completed survey will indicate your informed consent to participate in this research and indicate your assurance that you are at least 18 years of age and currently enrolled at Africa University, Zimbabwe

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