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KNOWLEDGE OF HIV/AIDS, RELATED ATTITUDES AND PARTICIPATION IN RISKY SEXUAL BEHAVIOUR AMONG FIRST AND FOURTH YEAR FEMALE STUDENTS AT THE UNIVERSITY OF BOTSWANA

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A research report submitted to the Faculty of Health Sciences, University of Witwatersrand in partial fulfillment of the requirements for the degree of Masters in Public Health

Johannesburg, March 2011

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DECLARATION

I, *Gordana Cavric, declare that this research is my own report. It has been submitted for the Degree of Masters in Public Health at the University of Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at this or any other University*.

_____

Gaborone-Johannesburg, 28 March 2010.

DEDICATION

I dedicate this work to my husband, Branko, for his kind understanding, support and encouragement throughout the duration of my studies and to my children Jelena and Bojan. Without their love and concern this work would never be completed. I also want to convey gratitude to my parents who always encouraged my academic career

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4. I also wish to express my heartfelt gratitude to the authorities of the University of Botswana for allowing me to do the research in their institution.

5. This research would not have been possible if the participants were not willing to take part. I wish to acknowledge the profound contribution made by all the students who volunteered to take part in the study.

ABSTRACT

Introduction

Botswana still has the second highest HIV prevalence in the world with little indication of any significant decline. In Botswana, women are disproportionately affected: young women account for more than half (58 %) of the adults living with HIV thus indicating a significant gender disparity in HIV infection. University educated, urban young women aged 19-39 have been identified as group at particularly high risk of HIV infection.

Aim

This study aimed to assess knowledge and attitudes regarding HIV and AIDS and how such knowledge and attitudes have implications for participation in risky sexual behavior among female University of Botswana students in their first and fourth years of study.

Methodology

This study was conducted at the University of Botswana (UB) in Gaborone. Data was collected using a self-administered questionnaire on Knowledge of HIV/AIDS and participation in Risky Sexual Behavior among female students in first and fourth year of studies at University of Botswana.

Results

The knowledge regarding the "window period" and infectivity during the window period was significantly lower for first year students compared to fourth years. Attitudes towards people with HIV were positive in both groups, while affirmative attitudes towards premarital sex are increasing as the students progress academically.

The analyses highlight that the percentage of women who reported having been sexually active the proceeding year was significantly higher among fourth year students (82.6%) than their first year counterparts (56.9 %), ($p<0.01$), with the number of partners significantly higher among women in their fourth year.

Significantly, 3% of first year female students stated that their partners did not want to use a condom while 7 percent of the participants themselves said that that was the case. Amongst fourth year UB female students responding, 4% said that their partners did not want to use a condom, yet 14% participant said that they themselves did not want to use one.

Overall, the prevalence of self-reported STI's was significantly higher among fourth year students when compared with first year students 19 of 155 [12.26%]vs. 4 of 144 [2.78 %] $p<0.01$.

Conclusion

This study explored the knowledge of HIV/AIDS and participation in risky sexual behavior amongst female students in their first and fourth years at the University of Botswana. The study supported the findings that higher levels of formal education are associated with better knowledge of how to protect oneself from HIV/AIDS transmission. Although many HIV/AIDS prevention campaigns might have contributed to educated women being knowledgeable about how to protect themselves from HIV/AIDS transmission and the importance from abstaining from risky sexual behavior, a small but significant proportion of women still do not use condoms consistently.

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LIST OF ABBREVIATIONS

ABC	Abstain, Be faithful, Condomise
ACHAP	African Comprehensive HIV/AIDS Partnership
AIDS	Acquired immunodeficiency syndrome
ARRM	Aids Risk Reduction Model
GDI	Gross Domestic Income
GDP	Gross Domestic Product
HIV	Human Immunodeficiency Syndrome
KAP	Knowledge Attitude Practice
NACA	National Aids Coordinating Agency
NSF	National strategic framework
PLWH	People living with HIV
STI	Sexually transmitted infection
UB	University of Botswana
UN	United Nations
UNAIDS	United Nations Joint Program on HIV/AIDS
UNDP	United Nations Development Program
VCT	Voluntary Counseling and Testing
WHO	World Health Organization

CHAPTER 1 INTRODUCTION

1.1 BACKGROUND

The human immunodeficiency virus (HIV)/Acquired immunodeficiency syndrome(AIDS) epidemic first appeared in the global consciousness in 1981 (CDC, 2001) and over the years it has become a crisis of global proportions. In order to confront the continued spread of the HIV/AIDS, research has gathered a significant amount of evidence on the modes of HIV transmission, acquisition and treatment. This body of evidence has guided policies and implementation of services. While a lot of progress has been registered on the treatment side of HIV/AIDS, challenges of preventing HIV transmission and acquisition remain, more particularly in terms of behavior change.

Focused attention has been directed at the African continent as the continent most affected by HIV/AIDS, with attention given to the women in the reproductive period as the most affected subpopulation. The understanding of risky behavior within those sub-populations is needed to guide interventions aimed at reducing the risk of infection (UNFPA, 2008).

Women in general have been particularly vulnerable to HIV. In many countries, women and girls are at greater risk of HIV/AIDS due to gender inequality, discrimination, and stigma. Many women and girls also lack access to prevention and health care services. Around 61 percent of all adults living with HIV in sub-Saharan Africa are women (UNFPA, 2008).

The HIV/AIDS epidemic has spread rapidly in some regions of the world. The sub-Saharan African region has one of the highest rates of infection, particularly among women: 76 % of people infected aged 15-24 are female (UNFPA, 2008) There are a number of factors explaining the vulnerability of women to HIV including poverty, lack of education, gender inequality, gender based violence (UNFPA, 2008). Botswana has the highest HIV prevalence in Africa which has decreased dramatically the life expectancy to below 40 years (UNFPA, 2008). The loss of adults in their productive years has serious economic implications. In order to combat this potential loss of life and economic productivity, Botswana has declared the HIV epidemic an emergency, scaled up HIV/AIDS treatment and taken steps to prevent further spread of HIV. In 2002 Botswana became the first country in Africa to provide anti-retroviral treatment (ART) to all eligible citizens. This intervention resulted in an increase in life expectancy from 37 years to 53.4 years (UNFPA, 2008). The success of the Botswana ART program has been hailed as an example for other nations. Despite ten years of programs targeting HIV prevention, treatment and care for people living with HIV (PLWH), Botswana still has the second highest HIV prevalence in the world with little indication of any significant decline (CSO, 2009). In an address to the United Nations assembly in June 2001, former President, Festus Mogae, summed up the serious nature of the situation by stating that Botswana, a country of slightly less than two million people, is threatened with extinction as a nation (Mogae, 2001).

More than 300,000 people in Botswana are infected with HIV; 58% of whom are young women (CSO, 2009). The HIV prevalence is increasing among young people age 15-24 (from 17% to 17.4% in 2004 and 17.6% in 2008) (CSO, 2009).

University educated, urban young women aged 19-39 have been identified as a group at high risk of HIV infection (CSO, 2009). This finding was alarming as these persons are from a section of the society with the best access to information on how to protect themselves, and have better access to health services (including HIV prevention services) than the rural population. It is however not an uncommon finding that despite good knowledge about protection from HIV transmission, and even when young urban women were either unsure about or distrusted their male partners because they believed these men to be engaging in risky sexual behavior, the women still engaged in unprotected sex (MacPhail et al., 2001). Similar findings were reported in the region among university students, who tend to engage in risky sexual behavior under influence of alcohol and peer pressure (Seloilwe et al., 1999). The rates of risky sexual activity have been increasing among students in South Africa (Anderson et al). Kuteeue, (2009) reported that only 73% of sexually active university students in Namibia used condoms; however, sexual activity increased from 51% to 85% as the student progresses academically.

The University of Botswana has put in place an HIV program that provides education on preventing HIV/AIDS transmission as well as treatment. The University of Botswana is the major provider of tertiary education in Botswana with over 13,000 students currently enrolled, which represents 2.5% of total youth nationwide. This young, well-educated group constitutes a very valuable resource in a country that is losing a significant percentage of its economically active population to the HIV epidemic (Britannica, 2009). Chilisa's, (2001) findings suggest that there are socioeconomic, demographic and cultural factors associated with high risk sexual behavior among University of Botswana students. However, the knowledge and attitudes of urban, university educated young women about HIV has not been explored sufficiently. To fill this gap, our study explored the knowledge, attitude and behavior (KAB) of first and fourth year female students at the University of Botswana. The focus on first and fourth year female students was to ascertain whether KAB change as the student's progress academically.

1.2 AIMS AND OBJECTIVES OF THE STUDY

Aims

This study aimed to assess knowledge, attitudes and behavior regarding HIV among first and fourth year female students at the University of Botswana.

Objectives

The specific objectives of this study were:

i.) *To describe the socio-demographic profile of* University of Botswana *female students in their first and fourth years, specifically looking at age, and marital status by year of study.*

ii.) *To determine whether there is a difference in knowledge HIV/AIDS (HIV transmission, window period and normal number of CD4 cells) among first and fourth year students.*

iii.) *To determine whether there is a difference in attitude of first and fourth year UB female students towards HIV/AIDS and premarital sex.*

iv.) *To characterize the sexual practices of UB female students in their first and fourth years of study, in terms of:*

- Number of sexual partners;
- Condom use in the last year if sexually active;
- Proportion of students who know their HIV status;
- Proportion of participant who report having had a sexually transmitted infection (STI).

v.) *To determine the predictors of self-reported sexually transmitted infections among first and fourth year students at the University of Botswana.*

CHAPTER 2 LITERATURE REVIEW

2.1 LITERATURE RESEARCH FINDINGS

There is a significant body of evidence elsewhere on the knowledge, attitude and behavior related to HIV/AIDS among university students. The study on the nature of risky behavior amongst Hispanic youth as well as the social and psychological factors that engender this behavior has found that maternal communication about sex and lack of maternal support are key predictors of risky sexual behavior across generation groups among Hispanic youth (Trejos-Castillo et al., 2009). Even in instances where awareness is high, this awareness of risk of STI and HIV acquisition is sometimes acted upon in a selective manner. Moravcova, (2008) suggests that both male and female high school students in Prague are involved in risky sexual behavior; however, while women consistently used condoms with casual partners they tended to inconsistently use them during sex with steady boyfriends. Because of the high prevalence of the disease in Southern Africa, and Botswana in particular, the country has been a target for investigative studies. Chilisa et al., (2001) have researched the impact of HIV/AIDS on the education system in Botswana and found that even though the HIV epidemic has had a relatively limited impact on students, there is a high level of high-risk behavior amongst the general student population. Two factors important to engaging in high risk behavior are knowledge and attitude toward the behavior itself.

Lack of knowledge about a particular social behavior can often engender fear rather than positive change in the conduct that reflects present social norms which may be harmful to health (Iliyasu, 2006). Fear has not been found to be an effective mitigating factor between awareness and behavior change, instead it fuels stigma. A study conducted at various African countries (Uys et al., 2005), revealed that communities in these countries viewed and stigmatized people with HIV/AIDS largely through fear of acquiring the virus. Brown et al., (2008) found that although the general student population, based on their knowledge, had changed their attitudes to PLWHA, they themselves had made no major changes in reducing their sexually risky behavior. Ntseane, (2004) who specifically studied the sociological aspect of women and sexuality in Botswana argues that sexuality in the country has a complex social context. This complex social context is framed, primarily by socio-economic principles but also by patriarchal and political processes. Botswana's complex social context is also determined by a multi ethnic society, with each ethnic group operating its own unique sexual system. As such, apart from the larger population of Tswana peoples, comprising five major tribes (Bakalanga, Bangwato, Basarwa, Baherero and Barolong) there are other ethnic groups, some of which, like the Basarwa, are semi-nomadic. There are also a small number of citizens of Asian, South Asian and European origins. From an analytical perspective, Ntseane's study is particularly significant since it offers insight into what may appear to be promiscuity on the part of young, female Batswana, but is in fact sexual behavior resulting from the interaction of complex socio-economic, cultural and political processes

Ntseane's study suggests that Batswana sexuality is not to be contemplated in terms of Western norms and standards in addressing risky sexual behavior. Rather, empowerment processes and strategies that curb perceived risky behaviors and HIV/AIDS transmission, must take into consideration varied, local, cultural ways of knowing. Ntseane, (2004) also argues that sexuality is tribally and culturally regulated with various practices dictated by various ethnicities. For example, all Tswana-speaking tribes or ethnic groups in Botswana practice *mantsala* which means playful sex with blood or ethnic cousins, with an ethnic cousin being a person from the same ethnic tribe. In addition, *setlogolo ntsha dithogo* or sex play with a woman's "mother's brothers" or uncles is also practiced, particularly by the Bangwato and Bakgatla. While amongst the Baherero, a system of *otusira* or "replacement" is practiced, when a woman from the extended family of a deceased male is required to have unprotected sex with a male from the extended family, in this way the deceased will be "replaced" when she conceives. Lastly, the Barolong engages in cross-border relationships in a practice called *Seantlo* or "wife/husband inheritance": when a widow or widower remarries a sibling of the deceased husband or wife. Thus, the ethno-cultural beliefs that have influenced sexual behavior in terms of unprotected sex with multiple partners have had an impact on the prevalence of HIV/AIDS in Botswana and particularly amongst Batswana women.

The World Health Organization (WHO) reported HIV prevalence among pregnant women in antenatal clinics of more than 35.4% for Botswana but this is an overestimate of the population prevalence (WHO, 2008). The Botswana AIDS Impact Survey (BAIS) was conducted in 2008; six years after the national anti-retroviral (ARV) program enrolled the first patients. Using a stratified two-stage sample design, a sample of 8,275 households was drawn systematically from a listing of households (CSO, 2009). The main objective of BAIS was to provide up to date information on the HIV pandemic in Botswana with respect to its prevalence, incidence, as well as behavioral patterns, knowledge, care and support. In addition the objective was also to test socioeconomic and demographic factors that influence the pandemic. Uniquely for the purpose of this survey, blood samples were collected from participants for determination of prevalence and incidence.

The results showed that the national prevalence rate was 17.6 % (half the estimates obtained from antenatal care surveys) with a significant gender difference (20.4% among females vs. 14.2% in males). The incidence rates for the country were estimated at 2.9% (2.3% for males vs. 3.5% for females). Geographically, Botswana is divided into villages (referred herein as rural) and urban villages, towns (including Francistown and Lobatse) and the city of Gaborone (referred altogether herein as urban). Overall, rural areas had a prevalence of 16.6% as against urban areas which had a prevalence of 22.1%. Of concern is a relatively high HIV prevalence among university educated people, at (16.3%).

In summary, the current literature on knowledge, attitudes and behavior related to HIV/AIDS is not from a specific female perspective, neither from an ethno-cultural perspective, with the exception of Ntseane's study. Societies in Africa support and perpetuate patriarchal ideology and behaviors which hold gender difference as fundamental and fully explanatory division in human society.

Patriarchal ideology and behaviors have been detrimental to the sexual health of women, as women are not given the autonomy to make and take decisions about their sexual health, specifically how they protect themselves when engaging in sexual acts (Hafkin and Bay, 1976).

Current research is therefore particularly useful in showing ethno-cultural sexual practices in Africa, and Botswana in particular. However, there is a gap in the literature regarding female students' knowledge and attitudes of HIV/AIDS and the association of the level of knowledge and attitudes with risky sexual practices in Botswana. Our study attempts to address this gap.

2.2 SOCIO-DEMOGRAPHIC RISK FACTORS OF HIV

Botswana is a middle income, landlocked country in Southern Africa. It has one of the fastest growing economies, mainly based on the diamond industry. Botswana's gross national product (GNP) in 2007 was estimated at US $ 5840 while its gross domestic product's (GDP) annual growth rate for 2007 was 5.4%. However, the overall impact of HIV/AIDS in terms of its effect on the workforce, the expenses and opportunity costs of delivery of the ARV program, especially in terms of infrastructure support and development as well as personnel loss and labor supply compounded with the general economic decline worldwide, have resulted in a decline in GDP from 5.4% in 2007 to 4.8% in 2008. The loss of adults in their productive years further aggravates the decline in economic growth of Botswana, leading to increased poverty (UNFPA, 2008)

The Botswana economy is already characterized by high rates of unemployment and poverty. The unemployment rate was officially 23.8% in 2004; however unofficial estimates are closer to 40%. According to the 2004 BAIS II study, 24.2% and 25% of women and men respectively are unemployed. The 2005/06 Labor Force Survey estimated that higher proportion of women are unemployed (19.9%) compared to men (15.3%). Although Botswana has a stable parliamentary democracy, there is a disparity in distribution of wealth: close to a third (31%) of the Batswana population lives on less than $1.25 a day. The literacy rate was 83% in 2007 with the percentage of literate women being higher (UNFPA, 2008)).

An expected leveling in diamond mining production overshadows long-term economic prospects (Labor Force Survey, 2005/6). The current downturn in the economy caused by the global crisis which has adversely affected the diamond industry has caused an increase in the unemployment rate. Botswana as a nation was unprepared to manage its own internal economic crisis and HIV epidemic in terms of its infrastructure and social structure. A large and porous border makes it difficult to control large influxes of legal and illegal migrants. Large populations of immigrants, refugees and citizens in urban centers cause an additional burden on an already strained health and social systems (Labor Force Survey, 2005/6).

Economic pressures often lead to poverty for some African women which, is further compounded by forced migration due to the economic pressures and population dynamics. While for other African women they may have attained a certain educational and economic status that takes them out of poverty but still they are economically vulnerable.

Namely, they may experience economic pressures that force them to remain in exploitative situations, such as marriages with domestic violence, where they are dependent on their husbands for financial support. More so for this latter group of women, the economic pressure to become involved in abusive and exploitative relationships with more financially stable men in order to achieve their own financial stability or to meet economic needs, such as food, shelter and school fees is great.

Thus, economic pressures place women at risk for HIV transmission, when they enter into relationships that make them more financially secure but more vulnerable in terms of their sexual autonomy and the means to protect themselves from HIV infection. Due to the link between economic pressures and autonomy in sexual decision making, development initiatives have been established such as the 2003 Botswana National Strategic Framework which has dedicated a significant part of the framework to preventive measures and to identifying specific risk groups within the population (NACA, 2004). Such preventative measures places strong emphasis on the use of condoms by both male and female partners.

There are a number of public prevention and education programmes taking place in Botswana. Public awareness and education have previously been based on the "ABC" of AIDS: **A**bstain, **B**e faithful and, if you have sex, use a **C**ondom. Public campaigns are run to empower young people with an awareness of HIV and prevention messages on effective measures that protect against the acquisition and transmission of HIV (ACHAP, 2008). Successful social marketing and subsidization have substantially increased condom use in Botswana. Botswana has safe-sex billboards and posters everywhere, but it remains unclear how much impact this type of communication has on behavior change in the public (NACA, 2004). The Botswana Government, American governmental agencies, National Aids Coordinating Agency (NACA), African Comprehensive HIV-AIDS Partnership (ACHAP), and several other partners have initiated a prevention program for the high risk subgroups of the population. The program targeted all highly mobile populations nationwide, concentrating on the treatment of STI, condom promotion and prevention education. One key focus was encouraging safe sex practices through peer education and outreach activities.

The 2002 survey of pregnant women attending ANC clinics in Botswana found an average HIV prevalence rate of 35.4 percent. In the absence of any interventions, between 15 percent and 40 percent of babies born to HIV-positive mothers in sub Saharan Africa would be infected during pregnancy and delivery or through breastfeeding. The risk of mother–to-child-transmission (MTCT) of HIV is cut substantially through the use of antiretroviral prophylaxis and safer feeding practices (NACA, 2004).

The National Strategic Framework has rightly recognized that women represent a large cohort in the high risk of HIV infection. It is important however to understand that this cohort group comprises different subgroups that are not equally vulnerable. Further targeting should be considered among women according to the type and prevalence of vulnerability factors.

2.3 LACK OF THE KNOWLEDGE AS A RISK FACTOR FOR HIV/AIDS

Inadequate knowledge on HIV/AIDS is usually related to poor educational background and younger age, and it engenders stigma (Wolf et al., 2008). Research in Africa has shown that formal education of women is a significant predictor of HIV/AIDS knowledge (Iliyasu Z**,** 2006). While, in most sub-Saharan countries knowledge about HIV transmission methods and prevention has increased, considerable proportions of men and women still lack knowledge of specific prevention methods: abstinence, partner faithfulness, and condom use (Mishra et al., 2009).

This has implications for the prevalence of stigma in African communities. A study conducted in Madagascar on knowledge and awareness suggested that a significant number of respondents who were misinformed about HIV transmission gave a stigmatizing response, thus suggesting that increasing understanding about behaviors related to HIV transmission may result in lower levels of stigmatizing beliefs about infected persons (Lanouette et al., 2003).

2.4 ATTITUDE AS A RISK FACTOR FOR HIV/AIDS

Attitude can include (but is not limited to) misogyny, homophobia, xenophobia, and/or fear of stigma—all of which have played as factors in the spread of HIV/AIDS (Sayles et al., 2009). “Stigma is a chief reason why the AIDS epidemic continues to devastate societies around the world especially Sub-Saharan Africa,” (Ban Ki-moon, 2008). Stigma of HIV/AIDS not only makes it more difficult for people trying to come to terms with HIV and cope with their illness on a personal level, but it also interferes with attempts to fight the HIV/AIDS pandemic as a whole. On a national level, the stigma associated with HIV can obstruct governments from taking fast, effective action against the epidemic. Thabo Mbeki former President of South Africa had long denied that HIV caused AIDS, before he was put under both domestic and international pressure to admit that HIV caused AIDS. On the other side some of the poorest African countries have made a great progress in fighting HIV transmission because one of the Government strategies was to deal with religious and cultural taboos, which create stigma, directly. On a personal level it can make individuals reluctant to access HIV testing, treatment and care (Wolfe et al., 2008; Sayles et al., 2009).

Self-stigma and fear of a negative community reaction can impede efforts to address the HIV/AIDS epidemic by perpetuating ‘the wall of silence and shame’ that surrounds the epidemic. A study of 1,268 adults in Botswana found that stigmatizing attitudes had been reduced three years after the national program providing universal access to treatment was introduced. The study concluded that although improving access to antiretroviral treatment may be a factor in reducing stigma, it does not eliminate stigma altogether and does not lessen the fear of stigma amongst HIV positive people. The study also found that stigma is difficult to measure (Wolfe et al., 2008, Sayles et al., 2009).

Women with HIV or AIDS may be treated very differently from men in some societies where they are economically, culturally and socially disadvantaged, such as women in Botswana. They are sometimes mistakenly perceived to be the main transmitters of sexually transmitted

infections (STIs) and men are more likely than women to be 'excused' for the behavior that resulted in their infection (Stutterheim et al., 2009).

2.5 RISKY SEXUAL BEHAVIOUR AMONGST UNIVERSITY STUDENTS

Low family income and perceived need for material goods have encouraged young girls to have sex with older men (Twa-Twa, 2008). These factors are compounded by peer pressure which has an important influence on risky sexual behaviour, as well as the disempowering effect of the cultural perception of gender roles. University life with its greatly expanded opportunities for self determination and independence provides an important new context in which young people learn to manage their sexual relationships and their sexuality. Learning to manage sexuality provides opportunity to grow but also carries the risk of emotional trauma and pain such as STI and unplanned pregnancy, and violation of one's physical and mental integrity. Alcohol use among university students in Botswana is common and strongly linked to indiscriminate forms of risky sex (multiple or casual sex partners, failure to discuss risk issues before sex) and to the decision to have sex in the first place (Brown et al., 2008; Chilisa, 2001; Seloilwe et al., 1999). A study in Uganda has shown that female students were more likely to have several sexual partners than male students, a fact that supports an economic motive for sex by female students (Twa-Twa, 2008). Namely, Twa-Twa's study shows that girls' engagement in premarital sexual relationships is an attempt to provide for basic needs, rather than for experimentation or a desire for marriage and early motherhood.

Although the lack of information and knowledge about HIV transmission is an important factor, knowledge does not translate directly into behavioural change. In a study of University of Botswana students, Chilisa (2001) reported that as students advanced in their academic programmes, there were increased numbers of pregnancies and STIs, an indication that students engage in unprotected sex. University students often face financial difficulties as well as weak cultural, social, and family support, especially those who come from rural areas (ACHAP, 2008).

As these young women relocate from their home villages in pursuit of further educational opportunities, this separation weakens the extended family system, the custodian of oral tradition, through which values related to responsible sexual behaviour were transmitted from older to younger generations. Even when parents and relatives are present in the urban areas they are often overwhelmed by the pace of change in their children's lives. Studies done in Southern Africa have shown that parents and guardians feel helpless and unsupported when it came to discussing HIV/AIDS issues (Jones, 2006; Lugalla et al., 1999).

There has been growing concern since the late nineties at the University of Botswana regarding the increased number of pregnancies and STIs as well as the increased number of deaths due to chronic illness in female university students relative to the general population (Chilisa, 2001). However, the prevalence and incidence of HIV on the University of Botswana Campus is not known. The University of Botswana has thus taken several actions to address these issues, including the formation of an HIV/AIDS committee and a clinic together with a counselling centre that provides voluntary testing and counselling. However, student utilisation of this clinic

is low because of perceived lack of confidentiality (Brown et al., 2008). The University of Botswana established an HIV/AIDS policy that protects rights and the confidentiality of students as well as supporting non-discrimination practices that protect students and employees that test HIV positive. An HIV/AIDS course is offered to help with prevention by reducing risky sexual behaviour and increase the knowledge of students.

Some of the latest research on knowledge, attitudes and sexual practices (KAP) at the UB campus were conducted by Chilisa in 2001 and showed that students engaged in risky sexual behaviour despite being sufficiently knowledgeable about HIV. A number of developments have happened in the country and on the Campus since then that might have influenced the behavioural pattern of the students. In 2002 Government started to offer Voluntary Testing and Counselling (VCT) as well as antiretroviral treatment, on a large scale, to all eligible citizens. The University has formed various additional HIV support bodies, expanded the Wellness Centre and offered a course on HIV to all freshmen. The purpose of these measures is to raise HIV awareness among students as well as to offer counselling, testing and treatment to those eligible. Seven years after the KAP studies, Brown et al., (2008) studied the factors associated with sexual behavior of University of Botswana students. Easy access to alcohol, peer pressure and lack of finances are social factors that contribute to risky sexual activities, with or without coercion. Students describe life on campus as freedom from a life tightly controlled at home by parents.

This study suggests that an atmosphere of traditional tribal morals and religious beliefs is exchanged for a life on campus that often offers little guidance. The social phenomenon called “sugar daddies and sugar mommies” whereby young men and young women engage in sexual relationships with older men or women off campus in exchange for financial and material favors is common among students. There is great peer pressure for the so-called “Five Cs” - cash, clothing, cars, cell phones and celebrity status. Since young female students have more than one older sexual partner (trans-generational sex) and at the same time have boyfriends on the Campus (multiple concurrent partnerships) the implications of HIV are significant. It is less common, but not unheard of, for young men to get involved in sexual relations with older, well-established women.

Despite these efforts, the latest BAIS study shows that the female population is still more affected with the age range shifting from 25-39 years old to 30–44 years old especially amongst the urban population. This may be as a result of the prolonged life of infected persons due to the ARV treatment (CSO, 2009). However, incidence of new infection was still on the rise particularly among these age groups. This has given cause for concern that prevention and education may not be effective amongst the female urban population.

Chilisa, (2001) emphasized that lack of information about the causes and consequences of HIV/AIDS and STIs was an important factor that played a role in whether or not students engaged in risky behavior. Only 60% of the student focus groups agreed that the students received all the information and advice they needed regarding HIV/AIDS. Of interest was also the opinion, expressed by both male and female students at the University of Botswana, that, in relationships, males have the right to demand sex and the woman must comply. The decision about using a condom is often in the hands of the man (Brown et al., 2008).

In this study, both young men and young women made it clear that young women have no ability or right to say no to sex or to sex without a condom. This is a problem throughout Sub-Saharan Africa, and its importance is summarized in the motto from 2004: "AIDS wears a woman's face" (UNFPA, 2008).

2.6 BEHAVIORAL CHANGE THEORY

In order to frame properly a KAP study, it is important to understand behavioral change theories and models that attempt to explain the reasons behind alterations in individuals' behavioral patterns. These theories cite environmental, personal, and behavioral characteristics as the major factors in behavioral determination and often guide the development and refinement of health promotion and education efforts (Grizzell, 2008). One of these behavior change theories is the health belief model which stipulates that a person's health-related behavior depends on the person's perception of four critical areas: 1) the perceived susceptibility (an individual's assessment of their risk of getting the condition) 2) the perceived severity (an individual's assessment of the seriousness of the condition, and its potential consequences) 3) the perceived barriers (an individual's assessment of the influences that facilitate or discourage adoption of the promoted behavior) and 4) the perceived benefits (an individual's assessment of the positive consequences of adopting the behavior) (Glanz et al., 2008).

Applying the Health Belief Model to the HIV/AIDS pandemic in Botswana, the elements of the model address the following: i) the perceived severity and susceptibility to HIV transmission seems low; people still adopt high risk behavior that fuels transmission and acquisition of HIV in Botswana, despite availability of adequate means of prevention and protection such as media messaging, condom distribution and safe sex education; ii) the perceived benefits and barriers to the adoption of low risk behavior are prevalent and multifaceted, ranging from social to economic to cultural; HIV testing barriers such as knowledge of where to get HIV testing and counseling, fear of stigma of having an HIV positive result, and culturally based embarrassment toward sex and HIV.

Another important behavioral change theory is the Theory of Planned Behavior which is grounded in the Theory of Reasoned Action (Ajzen, 1991). The Theory of Reasoned Action purports that a person takes into consideration the consequences of a behavior before performing it (Ajzen, 1991). As a result, intention is an important factor determining behavior and behavioral change (Ajzen, 1991). In order to form the intention, an individual must develop a perception of the behavior as positive or negative along with his/her impression of her society's perception of the same behavior. Thus, personal knowledge, attitude, and social pressure shape his/her intention, which is crucial to his/her performing the behavior and consequently changing his/her behavior (Ajzen, 1991). As described earlier, women in African setting are differentially subjected to high intensity of social pressure, which might have an impact on their ability to adopt behavior change.

In the Theory of Planned Behavior it is stipulated that an individual is not in control of all factors affecting the actual performance of a behavior (Ajzen, 1991). Thus, the occurrence of the actual behavior is proportional to the amount of control an individual possesses over the behavior and

the strength of the individual's intention in performing the behavior (Ajzen, 1991). This might explain the disconnect between the observed prevalent high risk behavior in a context of high levels of HIV awareness. In this theory, self-efficacy is important in determining the strength of the individual's intention to perform behavior (Ajzen, 1991). It can be argued that many HIV prevention interventions emphasized raising knowledge and awareness of HIV and did not adequately provide for self efficacy.

Applied to the context of the HIV/AIDS, an individual would have to first develop an intention of using a condom as positive and negative behavior and then after assessing his/her community's perception of using condoms, develop the intention of actually using a condom when engaging in sexual acts with his/her partners. For instance, bad experiences with condom use such as loss of erection, premature ejaculation or condom breakage could mean that the user does not use condoms with unfamiliar partners (Tlou et al., 1992). Thus, unfamiliar partners, casual girlfriends or sex workers, may be the ones who have the highest risk of having HIV transmitted through unprotected sex.

In addition, the Theory of Planned Action in the context of HIV/AIDS transmission would also state that an individual does not have control of some factors affecting the actual use of a condom. These factors could include lack of resources or facilities to obtain a condom or lack of information on how to use a condom, when engaging in sexual acts. Furthermore, she/he may not have the self efficacy necessary to develop the intention to use a condom in his or her sexual behavior. In applying the Theory of Planned Behavior in the context of women in Botswana, a woman's capacity to initiate health-related behaviors, such as having protected sex by using condoms or getting HIV testing, is often constrained by imbalances in power relations, poverty, gender inequality and socialization processes that are outside of her control (Odoutolu , 2005). Women's behavior is thus generally regulated within the social, cultural and religious frame of values (Sweat et al., 1995).

2.7 SEXUAL ABSTINENCE

Abstinence is a key component of the HIV prevention messaging and awareness campaigns in Africa. As such, it is part of the knowledge the citizens at risk of HIV are supposed to have and therefore should be measured by any KAP study. The efficacy of abstinence messages has been debated widely by public health specialists, religious, political and civil society groups. The conflicting accounts emanating from these debates constitute factors that influence adoption of abstinent behavior. In the context of sex, abstinence means deliberately refraining from sexual intercourse or more broadly from any sexual activity. People choose abstinence for a variety of reasons. Probably the most common reason - promoted by some sex educators, most parents and nearly all religious groups - is to defer teen pregnancy and prevent STI.

In addition, some groups encourage abstinence for ideological and moral reasons, such as religious values or personal beliefs. Some people practice abstinence as a method of contraception. These individuals or couples may engage in non-coital sexual relations, sometimes called "petting", just stopping short of penetrative intercourse. Some individuals are

abstinent on a temporary basis, that is, until they get married or find the right partner. Others are permanently abstinent from intercourse and perhaps other forms of sexual contact as a safeguard against contracting or STI.

Teens who abstain from sex do substantially better on a wide range of outcomes. For example, teens who abstained from sex were less likely to be depressed and to attempt suicide; to get an STI; to have children out-of-wedlock; and to live in poverty and welfare dependence as adults (Karim, 2005). Teens who delay sexual activity were more likely to have stable and enduring marriages as adults. In addition to studies proving the benefits of sexual abstinence for teenagers, there are multiple studies available on specific programs (Trenholm at al., 2007), which show that abstinence education positively affects student attitudes and behaviors'.

In Thailand, abstinence was usually regarded as preserving virginity and virtue. This was seen in the Thai phrase of *rak nuan sa-gnuan tua* (love and preserve your young and feminine body and self). As seen in this phrase, the focus of abstinence is placed on women. For men, abstinence was not regarded so much as virginity or virtue rather was typically promoted in terms of way of showing respect for women or as a means of STI and HIV prevention (Kittisuksathit et al., 2006).

Although abstinence-only programs have increased in recent years, these programs have not been sufficiently evaluated. There is some indication that abstinence-only programs are not adequate. Programs that exclusively encouraged abstinence from sex did not seem to affect the risk of HIV infection in high income countries, as measured by self reported biological and behavioral outcomes (Underhill et al., 2007). Jemmott et al., (1998) evaluated the effects of abstinence and safer-sex HIV risk-reduction interventions on young inner-city African American adolescents' HIV sexual risk behaviors when implemented by adult facilitators as compared with peer co-facilitators and found that peer education was more effective. Both abstinence and safer-sex interventions could reduce HIV sexual risk behaviors, but safer-sex interventions might be especially effective with sexually experienced adolescents and might have longer-lasting effects.

Some critics of abstinence-plus (Kirby, 1995) (abstinence and safe sex) programs have suggested that promoting safer sex along with abstinence might undermine abstinence messages or confuse program participants; conversely, others have suggested (Trenholm et al., 2007) that promoting abstinence might undermine safer-sex messages. Many abstinence-plus programs appear to reduce short-term and long-term HIV risk behavior among youth in high-income countries. Abstinence programs are not sufficient to effectively curb HIV epidemic; they could send conflicting messages. There are no indications that they could be efficient in reducing HIV transmission (Ahmed et al., 2001).

2.8 AGE OF SEXUAL DEBUT

The age of sexual debut is a corollary of the success or failure of abstinence among the youth. Early sexual debut is also associated with increased risk of HIV transmission. In the context of HIV, sexual debut is an important marker of the risk though the choice of sexual partner plays

an equally important role. Those who become sexually active early are likely to become HIV infected more than those who delay sexual activity (Karim, 2005). Same author found that encouraging adolescents to delay sexual debut as well as to reduce the number of their sexual partners, helps to prevent unintended pregnancies.

Age of sexual debut is linked in some communities with coercion. In sub-Saharan Africa the average age of sexual debut is between 15-17 for both men and women. In South Africa there were indications that age of debut for women was less than 16. Earlier sexual debut has been associated with greater sexual risk because of lack of knowledge, experience and lack of negotiating skills. There are some studies that indicate that early sexual debut showed a higher predisposition for sexual networking and risky behavior later in life which naturally leads to greater risk of HIV infection (Karim, 2005). Experiences of sexual coercion and violence are common among youth in patriarchal societies such as Botswana, highlighting the need to address gender-based violence at the community level to mitigate early age of sexual debut.

Research done in Brazil (Moore et al., 2006) has shown that the perception was that men have an urgent need for sex. This perception caused women to fear abandonment, anger or violence if they refused to have sex with their partner. The participants believed that women had to act passively the first time they had sex because taking the initiative (for example, by asking their partner to practice contraception) would lead him to accuse them of having previous sexual experience. That could be one of the possible reasons behind early, and to some extent, coerced sexual debut.

2.9 TRUST, COMMITMENT, FIDELITY AND CONDOM USE

In the prevention of HIV, people are encouraged to be faithful to their sexual partners, and when this is not feasible, to use condom correctly and consistently. A combination of personal experience and societal factors play a role in the adoption of these behaviors. For sexually-active individuals there are two ways to avoid HIV infection: long term fidelity with an uninfected partner or consistent condom use. Trust and commitment play a complex but critical role in both fidelity and condom use. While trust and commitment to one's partner are often barriers to condom use (Agha et al., 2002), they are likely prerequisites for long-term fidelity.

Research on the link between trust and condom use is emerging (Klein et al., 2005), yet the relationship between trust, commitment, and long-term fidelity has yet to be explored. In fact, of the three standard methods of preventing the sexual transmission of HIV—abstinence, fidelity, and condom use—fidelity remains relatively under researched. To better address HIV prevention the relationship that trust and commitment have with condom use and fidelity must be better understood.

For young adults in sub-Saharan Africa, the main reason for not using condoms is trust in one's partner (Agha et al., 2002; Plummer et al., 2006). A generalized interpersonal trust in one's partner reduces the feelings of risk despite not knowing a partner's sexual history or HIV status. Partners feel safe because they generally "trust" that their partner has goodwill toward them and would not intentionally infect them (Longfield et al., 2002).

Condoms reduce the probability of HIV transmission in a single sex act by approximately 95% (Pinkerton et al., 1997). Estimates from Malawi suggest an impressive role for condom use in reducing a woman's lifetime risk of HIV (Bracher et al., 2004). Simulations based on parameters found in southern Malawi (with an estimated HIV prevalence rate of 15 percent) suggest that a woman's lifetime risk of HIV is 42% with no condom use, a woman's lifetime risk of HIV is 27% when men consistently use condoms with bargirls, and a woman's lifetime risk of HIV is 9% when men use condoms with all non-marital partners (Bracher et al., 2004). Consistent use of condoms - use with every partner from start to finish - is necessary for AIDS prevention (Ahmed et al., 2001, Bracher et al., 2004). At the population level, condoms are more protective when a small group consistently uses condoms than when a large group uses them inconsistently (Bracher et al., 2004).

Condoms are less likely to be used with spouses than with partners to whom an individual is not married (Kapiga, 1996). The difference in condom use by marital status likely reflects that married individuals are less likely to be concerned with preventing pregnancy and putting themselves at risk for HIV infection. Studies in Africa suggest that condom use is influenced by an individual's beliefs about condoms and their beliefs about themselves. Negative beliefs about condoms include that they reduce pleasure, are only necessary with risky partners, indicate a lack of trust in a partner, indicate the user is promiscuous, interfere with the important exchange of fluids between partners, and have holes that allow HIV to pass through or are laced with HIV (MacPhail et al., 2001).

In addition, as condom use is often negotiated by the partners, the influence of an individual's partner is important in condom use. Women in rural Mwanza, Tanzania appeared unwilling to insist on condom use with partners who refused to use condoms (Plummer et al., 2006). Students in Tanzania who believed that their partners do not like condoms were less likely to use condoms consistently (Maswanya et al., 1999). Thus, the literature supports that although condoms are effective at reducing the transmission of HIV, levels of consistent condom use remains inadequate to halt the spread of the HIV epidemic.

2.10 SEXUALLY TRANSMITTED INFECTIONS (STIs)

STIs increase the vulnerability of uninfected people to acquire HIV and increase the risk of HIV-infected individuals to infect their partner. The rate of HIV infection is considerably higher in patients who present to STI clinics with *genital* ulcers or mucosal inflammation. Genital infection increases the risk for HIV transmission because of several mechanisms. Genital infection disrupts the host's mucosal barriers and/or increase the number of HIV susceptible cells in the genital tract (Chattopadhyay, et al., 2004).

STIs also lead to an increase in HIV shedding in the genital secretions and, therefore, increase the risk of HIV transmission. Chattopadhyay, et al., (2004) have shown an increase in the HIV viral load of genital secretions patients with an STI. A large study in Tanzania showed a significant increase in HIV concentration in the genital secretions of HIV-infected women with STI in comparison to HIV-infected women with no STIs (Kapiga, 1996).

STIs are closely related to risky sexual behavior. Young people often practice unprotected sex under the influence of alcohol, peer pressure, poverty and gender imbalance. Buston, (2010) has published that in United Kingdom (UK) promiscuous sexual behavior has become just "part of the territory" in day to day life. In the report it was stated that half the cases of STI infections could be found in the 16 to 24 year age group, even though this group made up only 12% of the population. The 16-24 age group accounts for 65% of all cases of Chlamydia, 50% of all cases of genital warts and 50% of all cases of gonorrhea infections diagnosed in STI clinics across the UK in 2007. In addition, the rate of HIV infection among young, sexually active male homosexuals has almost doubled since 1998, the study found.

In conclusion the same author reported that young people are disproportionately affected by STIs. This is because they are more sexually active, have more sexual partners, tend to have overlapping sexual relationships and are more likely to have casual sexual relationships. The presence of an untreated STI (ulcerative or non-ulcerative) can increase significantly the risk of becoming infected with HIV and transmitting the infection.

On the other hand, early diagnosis and improved management of other STIs can reduce the incidence of HIV infection by up to 40%. Prevention and treatment of all STIs are therefore important for the prevention of HIV infection (Essieu et al., 2006). The link between STIs and increased transmission of HIV possibly is coupled with a sexual practice that is called “dry sex”. It is not uncommon in Sub-Saharan Africa and might be one of the causes that are fueling the epidemic (Baleta, 1998).

2.11 SUMMARY

There are multiple factors that are influencing the HIV epidemic in Botswana. Young, urban educated women are highly affected. The reasons this particular sub-group is more vulnerable to HIV are complex. In order to understand the reasons for such behaviour this study is using a sample of the University of Botswana female population. Since urban female students present a specific subgroup there is a need to do an in-depth study and explore any difference in knowledge of HIV, HIV related attitude and engagement in some risky sexual behaviour between the first and the fourth year students. This may suggest that there are factors in the campus environment that are influencing this particular group.

CHAPTER 3 METHODOLOGY

3.1 STUDY DESIGN

This was cross sectional study on knowledge of and attitude toward HIV/AIDS and participation in risky sexual behavior among female students at first and fourth year of studies at University of Botswana.

3.2 SETTING AND PARTICIPANTS

This study was conducted at the University of Botswana (UB) in Gaborone. The University of Botswana is the largest state-funded tertiary institution and provides education for students from a wide variety of socio-economic backgrounds. UB offers pre graduate training in a wide range of disciplines including economics, law, management, education, literature, science, engineering, and medicine.

3.3 STUDY AREA

The study was conducted at the University of Botswana's female residence that is divided in two blocks: old and new residence.

3.4 STUDY POPULATION

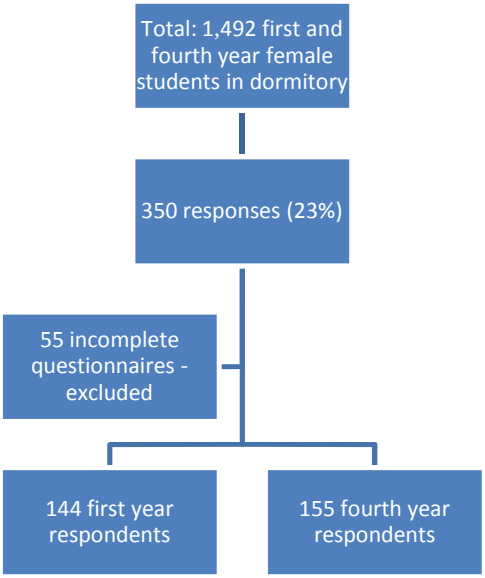
The student population comprised of mostly young adults, starting university immediately after their post-secondary education, of an average age range of 18-20 years. There are however a few older adult undergraduates. Overall, the gender ratio is approximately equal. The majority of the students come from outside Gaborone. This study included only the first and fourth year female students living in the campus residences. A total of 4,478 (2,985 female) students are residing on the Campus. Only female students in their first and fourth year students residing on the Campus were eligible for the study. The questionnaires were distributed in the dormitories of the first and fourth year students where 1,492 female students resided.

3.5 STUDY SAMPLE

For this study a sample of 112 undergraduate female students at first and 112 at fourth year of study was required. The year of study and gender were the only inclusion criteria. It was assumed that all the students have a similar socio cultural and economic background. Students at UB are accommodated by their year of studies. All first years female students occupy the same dormitory and fourth year female students have their own dormitory. The questionnaires were distributed in the dormitories of the first and fourth year students only where 1,492 female students resided. Recruitment was conducted for three working days. At the end of the recruitment period, all completed questionnaires were included in the sample. Three hundred and fifty (350) female students responded.

Fifty one (51) questionnaires were incomplete. These were excluded from the study. Of the remaining 299 respondents, 144 were first-year students and 155 fourth-year students. The ratio between male and female on the Campus is 1:1.5.

More than 90% of the categorical variables were found to have Kappa statistics over 0.4 (all $p<0.05$) and the coefficients of correlation for discrete variables varied from 0.72 to 0.96 (all $p<0.05$). To detect a significant difference, using an alpha level of 0.05 and a power of 80%, between a prevalence of self-reported STI of 10% among first year students and a prevalence of 25% among fourth year students, using a ratio of 1:1 among both groups, we required a sample size of 112 subjects in each group. For this calculation we used a continuity correction to the usual sample-size formula based on the normal approximation to the binomial distribution. This correction increases the sample size (for each group) by an amount approximately equal to 2/abs (p1-p2), where p1 and p2 are the population proportions for the two groups.



3.6 DATA COLLECTION

In order to provide anonymity to each student the principal investigator (author of this thesis) did not seek to get a list of the students resident in the residencies nor seek any student in particular. Every effort was made to reach as many students as possible within the three day period of data collection. The author sensitized students in their lecture hall prior to data collection, introducing the study to first and fourth year female students and letting them know that they were the target group. They were told that the questionnaire will be available in their dormitory, and instructed how to fill them in. After this sensitisation, the researcher visited every female block where first and fourth year female students resided and left self administered questionnaires at the reception areas of each dormitory with visible, written invitation and instruction for those students willing to respond to complete the questionnaire and deposit the filled ones in a box. These questionnaires were later collected by the author of this study.

The questionnaire was developed through a review of the literature using an in-depth interview survey on HIV/AIDS knowledge, attitude, sexual practices and stigma (Conron, 2008) and then modified using the results of the pilot on 10 female students. Questions to ascertain demographics (age and marital status), knowledge of HIV/AIDS, attitudes toward HIV positive people and premarital sex, incidence of STI's and sexual practices notably condom use, number of sexual partners in last 12 months were included in the questionnaire. HIV knowledge was assessed through a questionnaire of 11 questions divided in 4 categories:

- Knowledge of what HIV is
- Diagnosis of HIV
- Window period and infectivity during window period
- Modes of HIV transmission

3.7 PILOT STUDY

The revised instrument was pilot-tested among a group of 10 students who were randomly recruited during preliminary visit to the Campus. Students were visited in the Dormitories and asked if they wanted to take part in the interview. In-depth interviews were conducted by the researcher. Questionnaires (which utilized the questions on the final questionnaire distributed) were distributed to 5 female first year students and 5 female fourth year students that were conveniently chosen among residents of female dormitories. The instrument reliability was then evaluated by re-testing the same pilot group within a one-week interval. More than 90% of the categorical variables were found to have Kappa statistics over 0.4 (all $p<0.05$) and the coefficients of correlation for discrete variables varied from 0.72 to 0.96 (all $p<0.05$). To detect a significant difference, using an alpha level of 0.05 and a power of 80%, between a prevalence of self-reported STI of 10% among first year students and a prevalence of 25% among fourth year students, using a ratio of 1:1 among both groups, we required a sample size of 112 subjects in each group. For this calculation we used a continuity correction to the usual sample-size formula based on the normal approximation to the binomial distribution. This correction increases the sample size (for each group) by an amount approximately equal to 2/abs (p1-p2), where p1 and p2 are the population proportions for the two groups.

3.8 DATA MANAGEMENT AND ANALYSIS

Data were collected on the paper-based questionnaires and later transferred to MicroSoft Excel spreadsheet. Data input was done manually and constantly checked and re-checked to ensure, for example, that for each answer all respondents were accounted for.

A point was given for each answered question and scores were aggregated by categories. A score of two (over a total of three) or more was considered adequate knowledge of the respective category. For the evaluation of overall knowledge of STI's and HIV, a point was given for each category with satisfactory knowledge. An overall score of three (over a total of five) or more was considered satisfactory.

In this study out of 1,492 eligible students 299 were ultimately included in the survey. This sample size, after the 51 excluded questionnaires, provided us a power of 80% to detect a difference of at least 11% on the prevalence of self-reported STIs among both group. Statistical analyses were performed using STATA 10 (StataCorp, College Station, TX, USA). Difference in proportions across first and fourth year female students was assessed using a Chi square test.

Adjusted odds ratios and 95% confidence intervals summarizing the association between the selected variables among first and fourth year female students were calculated. Contrast statistics, which is a linear combination of two or more factors lever(means) averages whose coefficient adds up to zero, were further performed to test the linear trend of odds ratios. Student's t-test was used to determine mean age of sexual debut of first and fourth year female students. Chi-square test was used to test difference on the frequency of sexual activity, number of sexual partners, testing of HIV status, self reported STIs, usage of condoms prior year and reasons for not using condoms, appropriateness of having premarital sex, knowledge on HIV among first and fourth year female students. A $p< 0.05$ was considered statistically significant for these analyses.

Factors associated with high risk sex behavior were evaluated using univariate and multivariate logistic regression models. For these analyses we used self-reported STI's diagnosed and treated within the prior year as a surrogate for high risk sex behavior. The following six variables were included in the logistic regression analyses: i) year at university, ii) marital status (single vs. other), iii) age at first sex, iv) condom use (always/most of the times vs. rarely/never), v) number of partners within the last 12 months and vi) knowledge of STI's and HIV (satisfactory vs. not satisfactory). These variables were a priory based on literature review and on likelihood which suggest that they act as cofounders of main outcomes.

3.9 ETHICAL CONSIDERATIONS

The research protocol was submitted to the University of the Witwatersrand Committee For Research on Human Subjects (Medical).The permission was obtained under the number R 14/49 and is attached as the appendix C. The research proposal was also submitted to the Ministry of Health Ethical Committee Botswana. The permission is obtained under the Reference No: PPME-13/18/1 PS Vol III (42) and is attached in appendix C.

CHAPTER 4 RESULTS

4.1 INTRODUCTION

This chapter presents main results of the study. Baseline socio-demographic details of the study population are presented. Factors affecting knowledge on HIV/AIDS, premarital sex were explored. Sexual behavior of respondents and prediction of self reported sexually transmitted infections among first and fourth year female students at University of Botswana are presented.

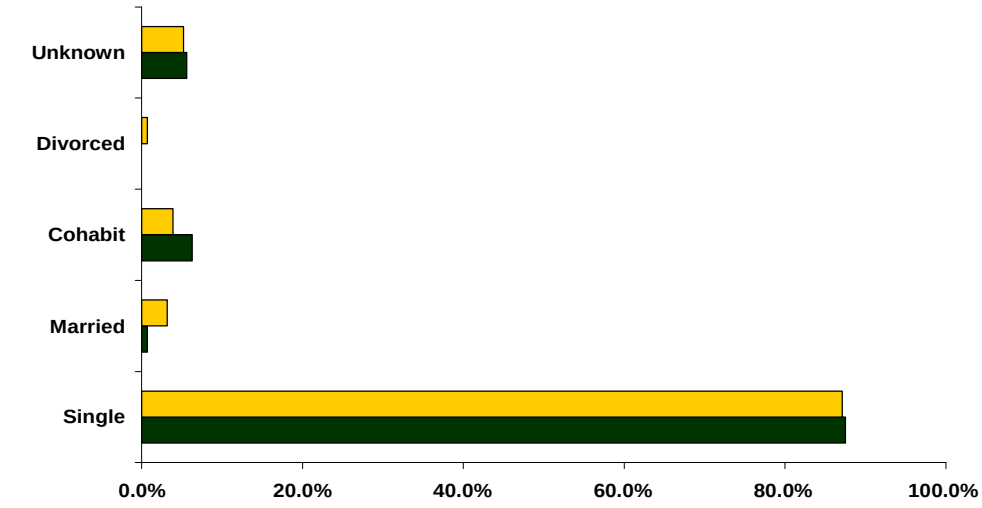
4.2 SOCIO-DEMOGRAPHIC PROFILE OF RESPONDENTS

Out of the 299 students that responded to the questionnaire, 144 (48.1%) were in their first year and 155 (51.9%) were in their fourth year at the university. The average age was 19.1 years for the first year students and 22.4 for the fourth year students (Tab. 1).

Table 1. Average age of first and fourth year female UB students

Year of Study	Average Age (years)
First Year	19.1
Fourth Year	22.4

The majority of respondents were single: 87.5% of first year versus 87.1% of fourth year (Fig.1).



	Single	Married	Cohabit	Divorced	Unknown
First year	87.1%	3.2%	3.9%	0.7%	5.2%
Fourth year	87.5%	0.7%	6.3%	0.0%	5.6%

Figure 1. Marital status of the first and fourth year female UB students

4.3 KNOWLEDGE OF HIV/AIDS

Overall, questions on knowledge of HIV/AIDS (about HIV infection, difference between HIV and AIDS, manifestation of HIV, window period and modes of transmission) were correctly answered by a majority of both respondent groups. All students answered appropriately the question regarding unprotected vaginal sex as a risk for HIV transmission and acquisition. As it is depicted in Table 2. students showed highest scores in the areas of difference between HIV and AIDS (132 respondents in 1st year (91.7%); 139 respondents in 4th year, (89.7%) and clinical manifestations of HIV (139 respondents in 1st year (96.5%); 146 respondents in 4th year (94.2%).

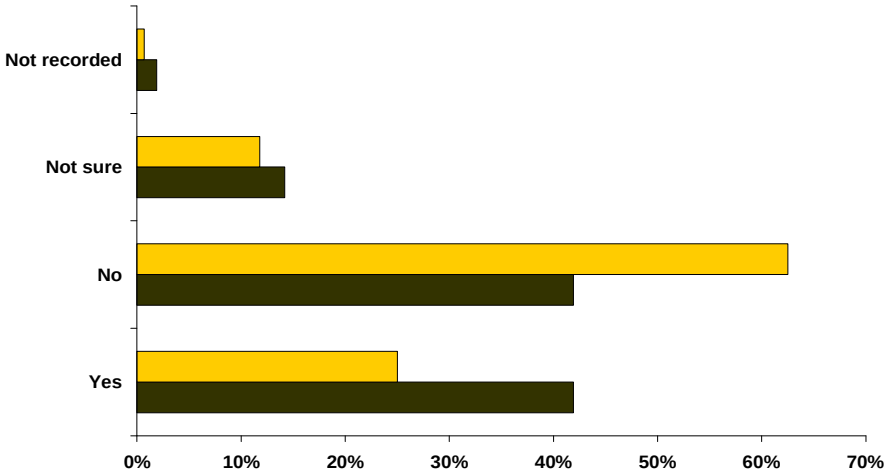
Table 2. Respondents' knowledge of HIV by categories and by year of study

Knowledge of…	First year, n=144 (%)	Fourth year, n=155 (%)	p
HIV infection	117 (81.2%)	128 (82.6%)	0.8
Difference between HIV & AIDS	132 (91.7%)	139 (89.7%)	0.7
Clinical manifestation of HIV	139 (96.5%)	146 (94.2%)	0.5
Window period	46 (31.9%)	89 (57.4%)	<0.01
Other transmission beside vaginal	48 (33.3%)	60 (38.7%)	0.4
Average score	3.4 (3.2-3.5)	3.6 (3.5-3.8)	<0.01
No, participants with knowledge	62 (43.06%)	87 (56.1%)	0.032

However, the knowledge of modes of STI's and HIV transmission other than unprotected vaginal intercourse was lower in both groups (33.3% and 38.7% for 1st and 4th year students respectively). Knowledge of the "window period" concept and the infectivity during the window period was significantly lower (46 [31.9%]) among 1st year students compared to 4th years (89 [57.4%]). There was no difference in knowledge (overall and by categories): difference between HIV/AIDS, clinical manifestation of HIV/AIDS, window period, ways of HIV transmission among first and fourth year students.

4.4 ATTITUDE TOWARDS HIV/AIDS AND PREMARITAL SEX IN THE TWO GROUPS OF RESPONDENTS

As first year students progress academically their attitude toward premarital sex changes from the negative to the positive when asked if it were appropriate to be sexually active before marriage, only 25% of first year students answered was acceptable while 41.95% of fourth year students thought it was acceptable (Fig. 2). Attitude towards HIV positive individuals was positive (i.e. every respondent answered they would feel comfortable with an HIV positive person sitting in a safe setting).



	Yes	No	Not sure	Not recorded
First year	25%	62.5%	11.8%	0.7%
Fourth year	41.9%	41.9%	14.2%	1.9%

Figure 2. Acceptability of pre-marital sex by groups of respondents

4.5 SEXUAL BEHAVIOR OF RESPONDENTS

The statistical regression analysis for sexual practices of the two groups of respondent used the following variables: i) number of sexual partners, ii) condom use in the last year if sexually active, iii) proportion of students who tested for HIV; and iv) proportion of participants who reported having had an STI. The majority of participants were sexually active.

There was no significant difference in the age of sexual debut, which was lower for first years (17.8 years) compared to fourth years (19.2 years) (p = 0.36).

Overall, 210 (70.2 %) students reported having had sexual intercourse within a year prior to the interview. Among the 89 women that reported not being sexually active in past twelve months 70 (23.4 % of the entire study population) did not reportage of sexual debut. The percentage of women who reported having been sexually active was significantly higher among fourth year students (82.6 %) than their first year counterpart (56.9 %), ($p<0.01$).

Table 3 indicates that 3 % of the 49 first year female students stated that their partners did not want to use a condom while 7 percent of the participants responded that they themselves did not want to use a condom. Amongst the 100 fourth year UB female students responding, 4 % said that their partners did not want to use a condom, yet 14 % participant said that they themselves did not want to use a condom (Tab. 3).

Ta**ble 3**: Sexual behavior among first and fourth year female students at the University of Botswana

Descriptors of sexual practices	First year (n=144)		Fourth year (n=155)		*p*
		%		*%*	
Sexual Activity during the past year	82	56.%	133	86.3%	0.003
Average number of partners during the last year	1.0	-	1.2	-	0.98
Ever tested for HIV?	52	36.1	105	67.7	0.001
Self reported STI's					
Yes	4	2.8	19	12.3	0.002
No	115	79.8	116	74.8	0.377
Not sure	6	4.2	7	4.5	0.892
Not recorded	19	13.2	13	8.4	0.248
Use of condoms during the prior year					
No sex	62	43	27	17.4	0.76
Always	22	15.3	45	29	0.32
Sometimes	22	15.3	42	27.1	0.54
Never	5	3.5	13	8.4	0.45

Overall, the number of partners was also significantly higher among fourth year female students (1.1 [0.8 - 1.3] vs. 0.6 [0.4 - 0.8], $p<0.01$). However, there was no difference when only the partners of women who reported being sexually active were included in the analysis (1.2 [0.9 - 1.4] vs. 1.0 [0.7 - 1.4], $p=0.98$). More than a third (36.1%) of first year students knew their HIV status, significantly ($p<0.01$) less than the proportion of fourth year students who had taken an HIV test (67.7%).

Table 4 indicates that 3 percent of the 49 first year female students stated that their partners did not want to use a condom, while 7 percent of the participants responded that they themselves did not want to use a condom. Amongst the 100 fourth year UB female students responding, 4 percent said that their partners did not want to use a condom, yet 14 percent of participants said that they themselves did not want to use a condom.

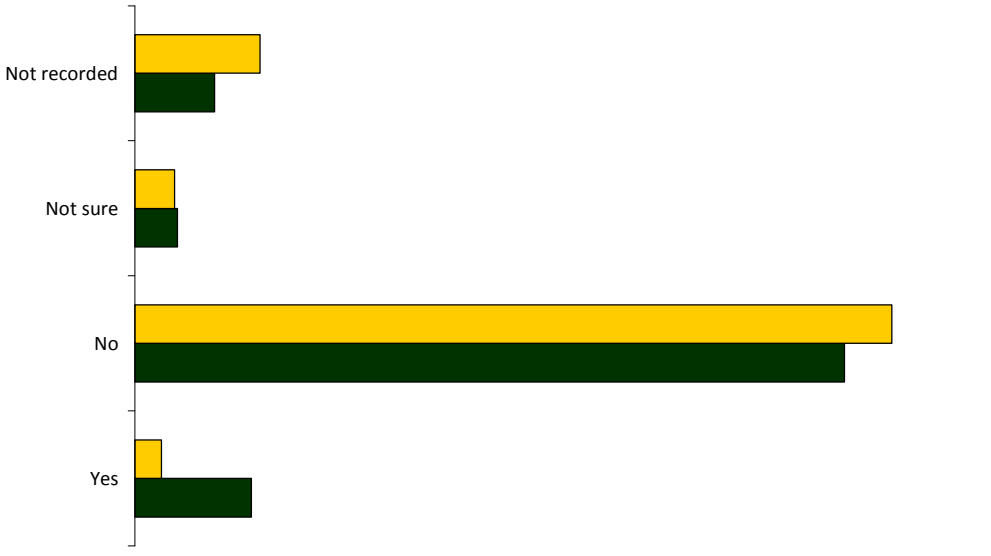
Table 4: Reasons for lack of condom use among participants

	First Year	Frequency	Fourth Year	Frequency
	N (49)*	Percent	N (100)*	percent
No specified reason for not using a condom**	27	55.1	55	55.0
Partner doesn't want**	3	6.6	4	4.0
Participant doesn't want**	7	14.3	14	14.0
No answer**	12	24.5	27	27.0

* No. participants that reported being sexually active and responded to the question: "Usage of condoms during last year".
** Differences in proportions between first and fourth year female students were not statistically significant
Denominator is given by the total number of participants that reported being sexually active and responded to the question: "Usage of condoms during last year".

4.6 PREDICTION OF SELF-REPORTED SEXUALLY TRANSMITTED INFECTIONS AMONG FIRST AND FOURTH YEAR STUDENTS AT THE UNIVERSITY OF BOTSWANA

UB female students in their first year were more likely to report that they did not have an STI, 79.9 % compared to 74.8 % of fourth year students who responded to the survey (Fig. 3). Yet, 12.3 percent of women reported that they have had a STI compared to 2.8 % of first year students. Of note is that only sexually active female students who answered positively about sexual activity in the past year were (82 among first year – 56.94% and 128 or 82.55% of fourth year students) were considered.



	Yes	No	Not sure	Not recorded
First year	2.8%	79.8%	4.2%	13.2%
Fourth year	12.3%	74.8%	4.5%	8.4%

Figure 3. Self reported STI amongst first and fourth year female UB students

The study year at the university, age at first sexual intercourse and number of partners were associated with self reported STIs in the univariate analysis (Tab.5). After adjusting for potential confounders, only age at the university was significantly associated with self-reported STI's (Fig. 3). Although there was no significant difference there was higher percentage of sexually inactive students among the first year students.

Condom use was inconsistent in both groups, however, amongst fourth year students, condom use was more than that of first year students. Only 15.3 % of first year students reported that they always used condom while 29.0 % of fourth year students use condoms consistently. When asked for the reason for not using condoms, 11.1 % of first years reported that their partners do not want to use condoms while 25.9 % of participants among first years did not want to use condoms. Among fourth year students 7.3 % reported that their partners do not want to use condoms while 25.5 %of interviewed students reported that they are the ones who do not want to use condoms.

Table 5: Univariate and multivariate analysis of factors associated with self reported STI

Characteristics of respondents	UNVARIATE ANALYSIS		MULTIVARIATE ANALYSIS	
	Odds Ratio	*p*	Odds Ratio	*p*
Year at the university	4.9	<0.01	4.6	0.020
Single	0.5	0.294	0.5	0.328
Age,	1	<0.01	1	0.094
Number of partners	1.4	<0.01	1.2	0.184
Knowledge	2	0.131	2	0.176
Condom use	1.5	0.382	2	0.173

Among those students who tested for HIV and had self reported STIs, 83.8 percent were fourth year students compared to 1.9 percent of first years. There was a statistically significant difference between first and fourth year students who tested for HIV and had self reported STIs (Tab.6). The result should be interpreted with caution, however, since, the cell size is small and women who are not sexually active were included, thus there is a need for more investigation.

Table 6: Self-reported STI among students who tested for HIV

HIV test among respondents with history of self reported STI	First year; n(%)	Fourth year; n(%)	Total; n(%)
NO	51 (98.1%)	88 (83,8%)	139 (88.5%
YES	1 (1.9%)	17 (16.2%)	18 (11.5%)
TOTAL	52 (100.0%)	105 (100.0%)	157(100.0%)
Wilcoxon Rank Sum Test p=0.043			

4.7 SUMMARY

The highlights of the findings of the univariate and multivariate analyses conducted can provide a snapshot of knowledge of HIV/AIDS and its implications for participation for risky sexual behavior by first and fourth year female UB students.

Of the 299 first and fourth year female UB students surveyed, knowledge regarding the "window period" and infectivity during the window period was significantly lower (31.9%) compared to fourth years (57.4%) ($p<0.01$). Twenty five percent of first year students answered affirmatively that premarital sex is appropriate while 41.9 % of fourth year students deemed it appropriate. Respondents who reported having been sexually active in past twelve months was significantly higher among fourth year students (82.6%) than their first year counterpart (56.9%), ($p<0.01$), with the number of partners significantly higher among women in their fourth year ;(0.6) among first years compared to fourth years (1.1) ($p<0.01$).

Significantly, only 3% of the 49 first year female students that responded to the condom use questions on the questionnaire stated that their partners did not want to use a condom while 7% of the participants stated it was themselves who did not want to use a condom. In contrast, of the 100 fourth year UB female students responding, 4% said that their partners did not want to use a condom, and 14% participant said that they themselves did not want to use one. There was no significant difference in the age of sexual debut, which was lower for first years (17.8 years) compared to fourth years (19.2 years) ($p = 0.36$).

A higher proportion of first year students report no STI (79.9%) compared to their fourth year colleagues (74.8%). Of those respondents who answered the question on whether they had an STI or not, 12.2% of women in their fourth year reported that they have had a STI compared to 2.8% of first year students. Similarly, a lower proportion of first year students (36.1%) reported getting an HIV test, compared to fourth year students (67.7%) ($p<0.01$). Overall, the prevalence of self-reported STI's was significantly higher among fourth year students when compared with first year students (19 of 155 [12.3%] vs. 4 of 144 [2.8%], $p<0.01$).

CHAPTER 5 DISCUSSION

5.1 THE KNOWLEDGE AS A RISK FACTOR

The findings from this study suggest that senior students have more knowledge of HIV/AIDS transmission compared to first year students. Evidence elsewhere has shown that lack of knowledge about a stigmatized social, mental or physical condition often causes fear of being associated with the stigmatized condition, rather than motivation to avoid the condition through behavior change. Fear has not been found to be an effective mitigating factor between awareness and behavior change, instead it fuels stigma. Thus, individuals are likely to continue performing the behavior that will bring about the exact stigmatized condition (Iliyasu, 2006). Formal education of women remains a significant predictor of HIV/AIDS knowledge (Iliyasu, 2006).

The data from this study indicate that there is in fact a correlation between formal education and HIV/AIDS knowledge. All the respondents answered the question regarding unprotected vaginal sex as a risk for HIV transmission and acquisition, appropriately. Likewise the respondents knew the difference between HIV and AIDS (First years 132 [91.67 percent]; Fourth years, 139 [89.68 percent] as well as the clinical manifestations of HIV (First years, 139 [96.53 percent]; Fourth years 146 [94.19 percent]). It can be extrapolated that the plethora of public prevention, education and awareness programmes, such as the ABC programme and other social marketing campaigns in Botswana (ACHAP, 2004), and even more specifically on the UB campus, have been effective. However, there may still be a need for targeted communication for younger women on University Campus as the respondent's knowledge of STI's and HIV transmission other than unprotected vaginal intercourse was lower among first years.

Contrary to the evidence elsewhere (Twa-ttwa2008) that non use of condom is related to the male partner refusal or pressure, this study found that a higher proportion of respondents chose not to use condom, compared to those who reported that the reason of non use of condom is due to male partner refusal (Odoutolu, 2005; Sweat et. al., 1995). This finding needs further research looking into dynamics of relationship and reasons why despite knowing about risk of HIV/AIDS transmission women decide to have unprotected sex. The knowledge on HIV transmission was lower for the "window period," and infectivity during the window period (46 [31.94%]) among first year students compared to fourth years (89 [57.42%]).

Considering the knowledge of HIV/AIDS and its influence on fueling the epidemic in Botswana there are some important points. As this study has shown there is need to improve the knowledge on HIV transmission and biological pathway of the HIV virus. This is needed specially among the freshman cohort , as only 31.9% of first year female students have given correct answers in explaining the window period and likewise only 33.3% of the first year female students have given correct answer on other modes of HIV transmission beside vaginal transmission. Essien , et al (2006) have shown that in-depth knowledge of HIV is an empowering factor that is leading to gradual behavioral change.

The studies in other African settings have shown that not only knowledge but also behavioral changes are important in curbing HIV epidemic (Jones et al., 2006; Lugalla et al.,1999).Looking into the factors that are behind reasons for inconsistent condom use is important. This study has shown that in both first and fourth year student cohorts there are a substantial percentage of female students that do not want to use condoms (7% of first years and 14% of fourth years). The conception is usually that women do not have a power to make a decision on condom use (McPhail et al., 2001; Maswanya et al., 1999; Mishra et al., 2009). There might be specific cultural, socio-economic and religious issues in Botswana that are compounding the fact that as women progress academically and gain more knowledge on HIV they still engage in risky sexual behavior.

5.2 ATTITUDE TOWARDS HIV/AIDS AND PREMARITAL SEX

The findings from this study show that attitude toward HIV favor participation in risky sexual behavior by first and fourth year female UB students. Respondents reported positive attitude towards HIV infected individuals (i.e. they would feel comfortable sitting in a safe setting with an HIV positive person). Likewise, first and fourth year students' perspectives on premarital sex could also lead to risky sexual behavior when viewed alongside the finding that first and fourth year students lack knowledge of the window of infectivity. Specifically, as first year students progress academically they become more accepting of premarital sex (25% of first year students vs. 41.95% fourth year). This supports the evidence that significant proportion of students at UB campus engaged in risky sexual behaviour despite being sufficiently educated about HIV (Chilisa et al., 2001)).

5.3 RISKY SEXUAL BEHAVIOUR AND SELF REPORT OF STI

This study found that the majority of participants were sexually active. Overall, 210 (70.2%) students reported having had sexual intercourse within a year prior to the interview. The percentage of women who reported having been sexually active the proceeding year was significantly higher among fourth year students (82.6%) than their first year counterpart (56.9%), ($p<0.01$). A small proportion of first year respondents (3%) stated that their partners did not want to use a condom while seven percent of the participants said that it was they themselves who did not want to use a condom. Similarly, four percent of fourth year respondents said that their partners did not want to, yet 14 percent participant said that they themselves did not want to.

In Sub-Saharan Africa, the main reason for not using condoms is trust in one's partner (Agha et al., 2002; Plummer et al., 2006). This small group of respondents is at a considerable risk of HIV transmission and acquisition since they forfeit the protective effects of condoms (Pinkerton et al., 1997; Bracher et al., 2004). From the perspective of the Theory of Planned Behavior, in looking at the reasons behind the increase in risky sexual activity among female University students as they progress academically, there are various socio-economic and cultural factors that are consistent with findings of other researchers (Odoutolu, 2005; Sweat

et al., 1995). However, there are some specificities that are within Botswana local context that need further research.

Looking into the local context and determining the reasons why women still get engaged in risky sexual behavior may be the key curbing the epidemic. According to Swat et al. (1995) women's behavior is generally regulated within the social, cultural, and religious framework of values. Ntseane (2004) conducted an elaborate study on the socio-economic context of women and sexuality in Botswana and argued very strongly that there is a complex social milieu that needs to be taken into consideration when discussing women and sexuality. That milieu consists of tribal, cultural, and religious values. What needs to be incorporated into these important issues are economic, social and gender factors that are related to changes in the traditional Botswana culture and adoption of the western values. The rapid "westernization" of the culture may be the important factor that is impacting the epidemic.

5.4 LIMITATIONS OF THE STUDY

Recall bias and reliability of data are well documented limitations of KAP studies especially when it deals with sexual practices, (Martin, 2000).

This study elicited only a 23% response. Since it is not known how non-responders differ from those students who chose to participate in the study, the direction of bias cannot be established. This is a limitation for the study. The questionnaire used for this study was abridged and omitted several important socio-demographic risk factors. Specifically, the questionnaire did not ask whether the respondent was monogamous or had participated at some time in multiple concurrent partnerships.

Furthermore, the survey questionnaire did not ask questions regarding what the respondents thought of, or held as a belief, regarding monogamy, multiple concurrent partners, and marriage. Such questions would have furthered the analysis on lack of condom use and participation in risky sexual behavior.

In context of Botswana, where marriage is not common and having a child before marriage is common, it was therefore not imperative to ask about marital status as it lacks relevance. What was more important was to ask on about the nature of relationship and the reasons for being in that type of relationship.

Regarding the survey questions regarding the respondents' HIV status, the questionnaire did not reflect if respondents knew their HIV status. The survey only asked if they had been tested for HIV - the assumption was that the respondent waited for the result for the HIV test which may not necessarily the case.

Another limitation was that the questionnaire did not ask questions regarding the age of partners.

This could have been used as a proxy measure for inter-generational sex and thus allow for an analysis of transactional sex or an opportunity to explore the phenomena of "sugar daddies". Therefore, there was no way to make a correlation between risky sexual behavior and power dynamics in intimate relationships when a first or fourth year female UB student has an older sexual partner.

Likewise, the questionnaire did not ask questions addressing forms of violence, whether sexual, mental or emotional. Thus, this study was not able to affirmatively state that educational level is a primary factor to participating or not participating in risky sexual behavior for lack of counseling for prior abuse could also play a stronger role in a woman's participation in risky sexual behavior.

Due to the number of limitations, this study does not allow generalization in the context of women and sexual behavior in Botswana. However some findings of this study (e.g. educated women still decide to get involved in risky sexual behavior) point to the possible directions for future research, particularly in the context of specific tribal , cultural and religious values that are compounded with socio-economic imbalances, as well as with the influence of western culture. Addressing these issues in future research may be a key component on the way to curbing the epidemic.

CHAPTER 6 RECOMMENDATIONS AND CONCLUSION

6.1 RECOMMENDATIONS

Community Education

The findings of this study show that first and fourth year female UB students were knowledgeable in certain aspects of the HIV transmission and how they can protect themselves from HIV infection. It was therefore evident that the many social marketing campaigns and HIV prevention communication programs might have had a positive impact on this cohort of students. However, it was also evident that the surveyed population did not grasp the importance of window of infectivity and how important it is that there is full compliance to 100 percent condom use. Thus, it is recommended that community education programs not just talk about the importance of wearing a condom but that a condom is used in every sexual encounter, even in long term "monogamous" relationships.

Health Service Recommendations

This study found that a proportion of first and fourth year female UB students had been tested for HIV and other STIs. Ideally, the majority of respondent should have been tested for HIV and other STIs in the last 12 months. Women's reproductive health is a major element of female overall health and thus all forms of testing, not just HIV, but all STIs including the Human Papilloma Virus as well as Pap smears should be taught to and provided to women within the cohort surveyed. Such health services should be promoted in secondary schools and at university campuses, as this study as shown that the mean age of sexual debut for respondents was 17: an age that is at the end of secondary and/or the beginning of university schooling.

Policy Recommendations

The findings from this study also lead to some important policy recommendations. Firstly, HIV/AIDS prevention policies supporting prevention services and programs must look not only to providing women within the age group of the surveyed cohort in this study with better knowledge transfer on how HIV/AIDS is transmitted, but also provide support structures for women's attitudes toward protecting their physical integrity. Current policies on HIV/AIDS transmission must support prevention and program services that focus not just on the technical aspects of HIV/AIDS knowledge, testing, treatment and care. These policies must also look into eliminating or reducing the strong external pull and push factors on women participating in risky sexual behaviors. HIV/AIDS prevention policies that focus on the medical aspects of decreasing HIV/AIDS transmission need to be more closely linked to prevention campaigns that focus on behavioral change. Often, these two approaches to HIV/AIDS prevention are on parallel paths without many points of intersection, often leading to confused messages and to a less educated general public.

Further Research

Despite many limitations of this study there is the conclusion that although women may have enough HIV/AIDS prevention knowledge, some women still participate in risky sexual behavior. This finding requires further and more detailed investigations that look into gender power relations that may contribute to this complex socio-economic, cultural and health problem.

6.2 CONCLUSION

This study explored the knowledge of HIV/AIDS, related attitude and participation in some risky sexual behavior amongst female students in their first and fourth years at the University of Botswana. The study supported the findings from prior research on African women's participation in risky sexual behavior that higher levels of formal education are associated with better knowledge on how to protect oneself from HIV/AIDS transmission. Although many HIV/AIDS prevention campaigns might have contributed to educated women being knowledgeable of how to protect themselves from HIV/AIDS transmission and the importance from abstaining from risky sexual behavior, a small but significant proportion of women still do not use condom consistently.

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APPENDIX A. INFORMED CONSENT

Title of Project: Knowledge of HIV/AIDS and participation in risky sexual behaviours among female students in the 1st and 4th years at the University of Botswana

Principal Investigator: Dr. Gordana Cavric, MD., MSc.,Spec., PhD.
P.O. Box 70424, Gaborone, Botswana
Telephone: (+267) 3959-166
E-mail: goca@mega.bw

Purpose of the Study: The purpose of this study is to measure the knowledge of and document the behaviour of HIV/AIDS risk factors among first-year and fourth-year female university students, and to compare knowledge and behaviour of HIV/AIDS risk factors between these two groups of female students. This measurement, documentation and comparison will aid in testing the hypotheses that female university students exhibit inadequate knowledge and engage in risky behaviour upon entry into university. Furthermore, the study will highlight that despite increasing knowledge over the course of their studies, these female students increase their participation in risky behaviours.

Procedures to be followed: You will be asked to fill out the "Knowledge and Behaviour Questionnaire," a two-page, 19-question self-administered survey format sheet.

Discomforts and Risks: There are no risks associated with your participation in this research beyond those experienced in everyday life. Discomfort may arise from responding to personal questions on sexual behaviour. However, all information will be anonymous and will be treated as strictly confidential.

Benefits: You should not expect to benefit from your participation in this study. However, by filling out the questionnaire, you will be helping the researcher to develop instruments to measure the knowledge of and document the behaviour of HIV/AIDS risk factors in female university students, as well as compare this knowledge and behaviour. In this way, you will contribute to the development of specific, culturally-unique, targeted interventions that may be used to reduce the incidence of HIV infections.

Duration: It will take about 20 minutes to complete the questionnaire.

Statement of Confidentiality: This survey does not ask for any information that would identify your comments, and your responses are recorded anonymously. You will not be identified in reports of this research.

Right to Ask Questions: You can ask questions about the research. The person in charge will answer your questions. Contact Dr. Gordana Cavric at 71300815 or 395-9166 with questions. If at any time you have questions concerning your rights as a research subject, you may call a representative of the Health Research Unit, Ministry of Health, Private bag 0038, Botswana, Tel: (+267) 391-4467.

Compensation: You will receive no compensation for your participation in this research.

Voluntary Participation: You do not have to participate in this research. You can stop your participation at any time, and you do not have to answer questions that you do not want to answer.

You must be 18 years or older to consent to participate in this research. If you are willing to participate in the study, please sign your name on the line below.

Participant: _____ Date: _____
Investigator: _____ Date: _____

(Dr. Gordana Cavric, Principal Investigator)

APPENDIX B. THE KNOWLEDGE AND ATTITUDE QUESTIONNAIRE

All information will be anonymous and will be treated as strictly confidential. Your name is not requested. Your participation is voluntary. It is important to give correct answers. To fill in this questionnaire, please circle the appropriate option or give the answer.

1.0	**Your age (years) _____**				
		Evaluation points			
		3	2	1	
		Yes	**No**	**Not sure**	
2.0	**Your marital status:**				
2.1	Married				
2.2	Single				
2.3	Divorced/Widowed				
2.4	Living with partner				
Score:_____ Maximum score: 15					

KNOWLEDGE

3.0	**HIV /AIDS is a disease that …**				
3.1	has a cure				
3.2	does not have a cure and kills				
3.3	does not have a cure and does not kill				
4.0	**An HIV-positive person is one who…**				
4.1	has the AIDS virus				
4.2	has AIDS				
5.0	**How does one know if he or she has a virus?**				
5.1	sputum test				
5.2	blood test				
6.0	**Can the person look healthy and have the HIV virus at the same time?**				
7.0	**Do you know about the window period?**				
8.0	**How long can the window period take?**				
8.1	three days				
8.2	three months				
8.3	one year				
9.0	**The normal number of CD4 Cells is …**				
9.1	between 100- 600				
9.2	between 500-1500				
9.3	between 2000-2500				
10.0	**What are the main means of transmission of the HIV virus? (More than one can be correct)**				
10.1	sexual intercourse without a condom				
10.2	sharing needles				
10.3	oral sex				
10.4	anal sex				
10.5	kiss on the mouth				
10.6	Tattoo				

10.7	Sharing a bathroom and kitchen with an HIV-positive person who is not your sexual partner.				
Score:_____ Maximum score: 84					

BEHAVIOUR

		Evaluation points			
		3	2	1	
		Yes	**No**	**Not sure**	
11.0	Would you be comfortable to be in a room in a safe setting with an HIV-positive person?				
12.0	Do you think that it is acceptable to have sex before marriage?				
13.0	Are you sexually active? (if no move to Qs 13.1-13.6)				
13.1	If yes, have you ever had a sexually transmitted infection?				
13.2	If yes, during the past year, I have …				
13.2.1	not engaged in sexual activity				
13.2.2	engaged in sexual activity always using a condom				
13.2.3	engaged in sexual activity using a condom most of the time				
13.2.4	engaged in sexual activity never using a condom				
13.3	If yes and you answered 3 or 4 above, what was the main reason for not using a condom?				
13.3.1	Partner refused to use condom				
13.3.2	I did not want to use condom				
13.4	If yes, have you ever been tested for HIV?				
13.5	If yes, what was your age at your first sexual intercourse? _____				
13.6	If yes, how many different sexual partners have you had in the last 12 months? _____				

Score:_____ Maximum score: 45

This survey is undertaken as part of a research requirement for a Masters in Public Health with the Faculty of Health Sciences, School of Public Health, University of Witwatersrand, in Johannesburg, South Africa.

Thank you very much for filling out this questionnaire.

APPENDIX C. CERTIFICATES

TELEPHONE: 3632000
FAX:3914467
TELEGRAMS:RABONGAKA
TELEX: 2818 CARE BD

MINISTRY OF HEALTH
PRIVATE BAG 0038
GABORONE
BOTSWANA

REPUBLIC OF BOTSWANA

REFERENCE No:PPME-13/18/1 PS Vol III (42) 11 September 2008

Dr Gordana Cavric
P.O. Box 70424
Gaborone

Dear Dr Cavric

Permit: KNOWLEDGE OF HIV/AIDS AND PARTICIPATION IN RISK SEXUAL BEHAVIOURS AMONG FEMALE STUDENTS IN THE 1ST AND 4TH YEARS AT THE UNIVERSITY OF BOTSWANA

Your application for a research permit for the above stated research protocol refers. We note that you have satisfactorily revised the protocol as per our suggestions.

Permission is therefore granted to conduct the above mentioned study. This approval is valid for a period of 1 year effective September 11, 2008.

This permit does not however give you authority to collect data from the selected site without prior approval from the management. Consent from the identified individuals should be obtained at all times.

The research should be conducted as outlined in the approved proposal. Any changes to the approved proposal must be submitted to the Health Research and Development Division in the Ministry of Health for consideration and approval.

Furthermore, you are requested to submit at least one hardcopy and an electronic copy of the report to the Health Research, Ministry of Health within 3 months of completion of the study. Approval is for academic fulfilment only. Copies should also be submitted to all other relevant authorities.

Yours sincerely

P. Khulumani
For/Permanent Secretary

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

Division of the Deputy Registrar (Research)

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
R14/49 Cavric

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER M080987**
PROJECT	Knowledge of HIV/AIDS and Participation in risky Sexual Behaviours among Female Students in the 1st and 4th Years at the University of Botswana
INVESTIGATORS	Dr G Cavric
DEPARTMENT	School of Public Health
DATE CONSIDERED	08.09.26
DECISION OF THE COMMITTEE*	Approved unconditionally

Unless otherwise specified this ethical clearance is valid for 5 years and may be renewed upon application.

DATE 09.01.21 **CHAIRPERSON** .....
(Professor P E Cleaton Jones)

*Guidelines for written 'informed consent' attached where applicable

cc: Supervisor : ON Chabikuli

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10004, 10th Floor, Senate House, University.
I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to a completion of a yearly progress report.**

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES...