

**DETERMINANTS OF ADOPTION OF HIV AND AIDS PREVENTION
STRATEGIES AMONG STUDENTS IN PUBLIC PRIMARY TEACHER
TRAINING COLLEGES IN KENYA**

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DECLARATION

This thesis is my original work and has not been presented for any award in any other university.

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DEDICATION

To my family

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ABSTRACT

HIV prevalence is high among young adults. Students in colleges lead a liberal life and continue to engage in risky sexual behaviours mostly without HIV protection. This study, therefore, investigated determinants that influence students in adoption of HIV and AIDS prevention strategies. Data were collected on students' social-demographic characteristics, knowledge levels on HIV, sexual behaviours and perceived risk to HIV infection. A cross-sectional correlational descriptive survey design was used. Using a national list of 20 public teacher training colleges, a random sample of 13 colleges was selected. Two second year classes of about 40 students were selected using simple random sampling method that utilized single stage cluster design. A total sample of 1,040 students was drawn. In addition, 12 discussants from each selected college were systematically sampled to participate in focus group discussions. In addition, 13 deans of students and 13 principals were interviewed. Descriptive statistics were generated for all survey items using Statistical Package for Social Sciences computer programme version 17. Chi-square test was used to test each hypothesis using alpha .05 as the level of statistical significance. Multiple regression analysis was conducted to identify predictors of adoption of HIV prevention strategies. Findings indicated that of the three effective strategies; abstinence was difficult to achieve with students, slightly more students practised fidelity and condom use was the most popular. Socio-demographic characteristics such as gender and religion were significantly related to adopted HIV strategies but the associations were weak. There was a positive weak association between HIV knowledge and HIV prevention strategies. No significant relationship was found between students' sexual behaviours and perceived risk to HIV and HIV prevention strategies separately. Group discussants believed that sex with multiple partners was a 'lifestyle' that had persisted in colleges because of the belief that college life is a time of 'exploration and experimentation'. It was concluded that gender and religion continue to be important factors in scaling down the pandemic; knowledge about HIV was necessary but by itself not sufficient to make students adopt prevention strategies. There was also a risk of students contracting HIV because of the poor assessment of personal risk to HIV. It was recommended that tutors be developed to clear HIV misconceptions; a surveillance system to track HIV prevalence in college be developed; and life skills education be made an examinable subject.

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LIST OF ABBREVIATIONS AND ACRONYMS

3M approach	Multi-sectoral, multi-disciplinary and multi-stakeholder approach
ABC	Abstain, Be faithful, use Condom correctly and consistently
ACU	AIDS Control Unit
AIDS	Acquired Immune Deficiency Syndrome
ARRM	AIDS Risk Reduction Model
ARVs	Antiretroviral Drugs
CBOs	Community Based Organisations
CDC	Centre for Disease Control and Prevention
CD4	Centre for Differentiation cell
CI	Confidence Interval
CSWs	Commercial Sex Workers
DEOs	District Education Officers
EFA	Education for All
ERNWACA	Education Research Network for West and Central Africa
ESA	Eastern and Southern Africa
FGDs	Focus Group Discussions
GoK	Government of Kenya
HBM	Health Behaviour Model

HIV	Human Immune Deficiency Virus
HEAIDS	Higher Education AIDS Programme
HEIs	Higher Education Institutions
IDUs	Intravenous Drugs Users
LSE	Life Skills Education
ILO	International Labour Organisation
IUCEA	Inter-University Council for East Africa
KAIS	Kenya AIDS Indicator Survey
KAB	Knowledge, Attitude and Behaviour
KAP	Knowledge, Attitude and Practice
KDHS	Kenya Demographic and Health Survey
KESSP	Kenya Education Sector Support Programme
KNBS	Kenya National Bureau of Statistics
MCP	Multiple concurrent partnerships
M.Ed	Master of Education
MGDs	Millennium Development Goals
MOE	Ministry of Education
MOEST	Ministry of Education, Science and Technology
MOHEST	Ministry of Higher Education, Science and Technology
MSAs	Metropolitan Statistical Areas
MSM	Men Who Have Sex with Men
NACC	National AIDS Control Council

NASCOP	National AIDS and STD Control Programme
NASTDCP	National STD Control Programme
NGOs	Non Governmental Organisations
OR	Odd ratio
PLWHA	People Living with HIV/AIDS
PTTCs	Primary Teacher Training Colleges
PSABS	Primary School Action for Better Health project
SCT	Social Cognitive Theory
SLT	Social Learning Theory
SPSS	Statistical Package for Social Sciences
SSA	sub-Saharan Africa
STDs	Sexually Transmitted Diseases
STIs	Sexually Transmitted Infection
TEPD	Teacher Education Professional Development
TRA	Theory of Reasoned Action
UNAIDS	Joint United Nations Programme on HIV and AIDS
UNESCO	United Nations Education Science and Culture Organisation
UNFPA	United Nations Population Fund
UNGASS	United Nations General Assembly Special Sessions
UNICEF	United Nations Children Education Fund
USA	United States of America

VCT	Voluntary Counselling and Testing Centres
VMCM	Voluntary Medical Male Circumcision
WHO	World Health Organisation
YRBS	National Youth Risk Behaviour Survey

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Health seeking behaviour has been the ambition of man since time immemorial. In the wake of Human Immunodeficiency Virus and Acquired Immunodeficiency Syndrome (HIV and AIDS) world nations have spent colossal amounts of resources in attempts to attain zero new HIV infections. Statistics show that HIV prevalence has levelled among adults aged 15-49 years since 2001. Despite the good news, prevention efforts are yet to make a significant impact on reducing new infections.

New HIV infections are on the increase especially among the young adults of between 15 – 24 years (UNAIDS, 2011). About 2,500 new infections occur daily among this group (Joint United Nations Programme on HIV/AIDS [UNAIDS], 2010; UNFPA, 2011). The new infections counter the progress made in treatments: For every one person on antiretroviral drugs (ARVs) two new people become infected (World Health Organisation [WHO], 2012). Therefore, with no AIDS cure yet discovered, preventing new HIV infections remains the only ‘medicine’ to halt and reverse the pandemic by 2015 if goal 6(a) of the Millennium Development Goals (MGDs) to be achieved.

In order for prevention efforts to be successful, the major sources of new infections need to be targeted. Globally, the 15 – 24 year olds have borne inordinate burden of HIV and AIDS than any other subgroup. Epidemiological studies show that from 2008 to 2012, this age group accounted for an estimated 40 to 45 percent of new adult HIV infections with absolute numbers of those

living with HIV and AIDS ranging between 5.0 - 5.4 million (UNAIDS, 2008 – 2012 reports). This is the age group within which majority of secondary schools, colleges and universities students fall. Since teachers play a fundamental role in the social and economic development of any society, their preparation as professionals to meet the challenges of post-modern living is a key priority for both governments and teacher training institutions. Any decimation of the group would mean a total collapse of the education system. Therefore, understanding college students' HIV prevention strategies would help to protect the youth and education systems.

Students in colleges are characterised by a sense of new independence, experimentation with sex and a feeling of invincibility. In addition, college environment offer them great opportunity for sexual exploration and experimentation (Adedeji, Titilayo, Balogun & Mainza, 2009; Marlene & Marlene, 2008). Indeed the Centre for Disease Control and Prevention (CDC, 2002) aptly describe colleges as the 'epicentre of HIV epidemic'. The risky sexual behaviours are accelerated by the fact that today's youth have grown up at a time when the HIV tide has abated. Therefore, they perceive HIV as a manageable chronic disease that does not really kill (<http://land.time.com/2013/11/12/no-condom-culture-why-teens-arent-practicing-safe-sex/#ixzz2lcdT4zan://healt>).

Studies have established that most young people deliberately ignore protection during sex to see what would happen (Jemmott & Brown, 2003) while others indulge in other forms of sexual behaviours that place them at increased risk of HIV infection (American College Health Association, 2010; Jemmott & Brown, 2003; Lewis, Malow & Ireland, 1999; and Mutinta & Govender, 2012). Many

students have multiple sex partners (Adedeji et al., 2009) and rarely use condoms during sexual encounters (Anyagu, 2008; Magu, Wanzala, Mutugi & Ndahi, 2012; Moore, 2008; Murray & Miller, 2008 and Mutungi, 2007).) In addition, most students have difficulties in achieving abstinence (Torimiro, Adisa, Okorie & Famuyiwa, 2007; and Shelton et al, 2004) and majority (60%) do not care to know their HIV status (UNAIDS, 2009). A survey conducted in USA showed that youth under the age of 25 were significantly less likely to have been tested for HIV and more likely to deny HIV risk than those who were 25 years and older (Kellerman et al., 2002).

Studies on prevalence of HIV among students in colleges and universities are scanty and the few available present mixed results. In some countries, HIV prevalence among students is higher than in the general population and lower in others. In Zanzibar, for example, HIV prevalence among students in institutions of learning is four times higher (2.5 %) than the national level that is a low of 0.6 per cent (Yusufu, 2012). In contrast, a national survey conducted by the Higher Education AIDS Programme (HEAIDS, 2008/9) at 21 Higher Education Institutions (HEIs) in South Africa showed that HIV prevalence among students in University of Kwa-Zulu Natal (UKZN) was marginally lower than the national student HIV prevalence. Similarly, a base-line study conducted by EALP/IUCEA in 2009 in six universities in Kenya recorded students' sero-positivity at 0.51 percent, which was way below the national 3.8 percent HIV prevalence among the 15 -24 year olds reported in 2007 by the Kenya AIDS Indicator Survey (KAIS, 2007).

Despite the reported low HIV prevalence levels among college students, epidemiological evidence indicates that heterosexual transmission of HIV among college students is increasing (CDC, 2010). Some of the sexual behaviours that readily facilitate HIV infection among college students are: unprotected sexual intercourse with an infected partner; sex with multiple or concurrent sexual partners and sex with high risk groups such as commercial sex workers (Odu & Akanle 2008; Halpevin & Epstein, 2007; Yang et. al 2005). This partly explains why prevention efforts directed to the youth emphasise adoption of strategies that focus on change in sexual behaviour.

Coates, Richter and Caceres (2008) advocate for use of behavioural prevention strategies such as; delay in onset of first sexual intercourse, reduction in number of sexual partners, testing for HIV sero-status and increase in condom use. The Abstain, Be faithful if sexually active, and use Condom correctly and consistently if not faithful to one uninfected partner (ABC) strategies have been singled out as the most effective. Combination of these strategies has successfully scaled down HIV incidence among at risk groups like men who have sex with men (MSM) in the USA, Canada, Europe, and Australia (Kippax & Race, 2003 and Winkelstien, Samuel, Padian & Wiley, 1987a, 1987b, 1988).

In Africa, the ABC strategies have effectively scaled down HIV infection in Uganda (Genuis & Genuis, 2005; Singh, Darroch & Bankole, 2005) and in Burundi, Namibia, Kenya, Tanzania, Thailand and Brazil (Kippax & Race, 2003; Slutkin, Okware, & Namara 2006; Stoneburner & Low-Beer, 2004; and UNAIDS, 2006/2001). In particular, laboratory and epidemiologic studies have demonstrated that the male latex condom when consistently and correctly used

has 80 to 90 per cent or more protective effect against transmission of HIV and other sexually transmitted diseases (Alford, 2005; CDC, 2002/1999; US/CDC, 2010; WHO, 2012).

The spread of HIV infection depends partly on sociodemographic determinants that are beyond individual control such as; age, gender, religion, marital status and area of residence. People who initiate sex early are likely to have sex with high risk partners or multiple partners and are less likely to use condoms than those who delay sexual initiation (WHO, 2004). Among the 15-24 year olds, young women are two times more likely to be infected than young men of the same age (UNAIDS, 2011). Attendance at religious services has been associated with reduced risk behaviour and high perceived risk to HIV infection (Trinitapoli & Regnerus, 2004). Muslims also tend to have lower levels of HIV prevalence compared to non- Muslims (Gray, 2004). Arguably, it is important that prevention strategies be designed in line with the demographic characteristics of the students.

Several studies show that college students possess high knowledge levels about HIV transmission and prevention compared to other young adults of their age (Irungu, Mumford, Younis, & Langford, 2009; Nesidai, Ng'ang'a, Mwangi & Wanzala, 2011; and Sulton, Hardnett, Wright, Wahi, Pathak et al., 2011). However, comprehensive and correct knowledge is still low among the 15 -24 year olds [36 % = young men; 24% = young women] (WHO, 2011). This implies that important misconceptions about transmission of the virus which have implications on adoption of prevention strategies still exist.

On the one hand studies conducted in Kenya and elsewhere demonstrate that knowledge has not resulted to significant changes in sexual behaviours among young adults (Likoye, 2004; Nyinya, 2007; and Ochieng, 2005). Therefore, a lack of basic knowledge about modes of HIV transmission and fear of knowing one's HIV status can lead to denial of one's risk of contracting HIV and failure to get tested. For instance, many HIV-positive youth in the U.S. do not know that they are infected (AIDS Alliance for Children, Youth & Families, 2005).

On the other hand, recent research has demonstrated that when young adults are adequately informed of HIV risks and prevention strategies, they change their behaviour in ways that reduce their vulnerability. UNAIDS (2012) report indicated that in the severely affected countries, HIV infection rates decreased by over 50 percent nationally and by more than 25 percent among young adults by 2011. The reductions were attributed to behavioural changes (UNAIDS, 2012). Nevertheless, these reductions are not significant enough to reverse the HIV and AIDS pandemic.

In response to the challenges fronted by HIV and AIDS to the youth, the international community have formulated agreements that emphasise young people's right to education, information and services that could protect them from HIV infection. The Kenya government is a signatory to these agreements and has devised efforts to respond to HIV and AIDS prevention. This is facilitated through HIV and AIDS education programmes in schools, colleges and universities; media campaigns; Voluntary Counselling and Testing (VCT) services; and social marketing of condoms.

Particularly, in the education sector, there is an explicit education sector policy that deals with the pandemic formulated in 2004 (Republic of Kenya, 2004) and revised in 2013 (Republic of Kenya, 2013). Primary Teacher Training Colleges (PTTCs) are supposed to develop their own institutional policies in line with the education sector policy. HIV and AIDS is also one of the 23 investment programmes in the Kenya Education Sector Support Programmes (KESSP) 2005 - 2010 that defines Kenya's major education reforms (MOEST, 2005).

Despite these efforts, HIV prevalence has remained a high of 3.8 per cent among the 15-24 year olds in Kenya (Kenya AIDS Indicator Survey, 2007). Unfortunately, data on HIV prevalence on college students and staff is unavailable due to weak surveillance systems in Kenya (Nzioka, Karongo & Njiru, 2007). UNAIDS (2011) report points out that only few countries have monitoring systems in place that quantify absenteeism, morbidity and mortality of students and staff infected by HIV and AIDS. Since HIV has a long latency period before development of clinical AIDS, many cases of HIV and AIDS identified among people in their 20s or even early 30s can be said to have been acquired during their teen years or in their early 20s (Kirby, 2002); a time when most people are in high school or college.

Since HIV and AIDS is a totally preventable disease yet it still ravages man, it is important to understand why many young adults ignores or downplays the need to adopt HIV and AIDS prevention strategies. As literature suggests, young people engage in unsafe sexual practices due to a host of factors. Therefore, the more information academicians and researchers can gather on what determines adoption of HIV prevention strategies among young adults, the more directed

programmes can be in order to teach principles of safe sex. It is against this background that this study sought to investigate which selected demographic characteristics, knowledge factors, sexual behavioural factors, and perceived risk to HIV and AIDS influence adoption of HIV and AIDS prevention strategies among students in PTTCs.

1.2 Statement of the problem

The Kenya government is a signatory to the international protocol of ‘towards zero new HIV infections by 2015’. To achieve this, several efforts have been made including: knowledge and awareness campaigns that have seen HIV and AIDS knowledge rise to over 90 percent in the general population (Kenya Demographic Health Survey, 2003/2008/09). In addition, several tailor-made interventions have been implemented to curb the spread of the virus among students. The integrated HIV and AIDS curriculum and Life Skills education specifically address the pandemic. Other institutionalised HIV and AIDS programmes include; ‘The Primary School Action for Better Health project (PSABH)’ that provides training to Deans of Curriculum and students in PTTCs; and the ‘Kenya Teacher Education Professional Development’ (TEPD) programme that prepares tutors in public PTTCs to integrate HIV and AIDS prevention into teacher instruction besides providing training in strategies to combat the spread of the virus among students.

Despite the immense efforts, the HIV prevalence has remained unacceptably high in Kenya among students in colleges and youth in general. Students seem not to have adopted effective HIV and AIDS prevention strategies as evidenced by teenage pregnancies and early sex debut at 14 years (NASCO, 2009).

Demographic survey data also shows that rates of infection among the 15-24 year olds are still high (NASCOP Final Report, 2009; UNAIDS, 2011). In 2009 an estimated 42,000 new HIV infections occurred among Kenyans aged 15-24 years (UNAIDS, 2010). Epidemiological data also extrapolates that in Kenya, 1 out of 25 (4.2%) of the 20-24 year olds is usually infected by the time they enter young adulthood (Kenya National Bureau of Statistics, 2010).

The true picture of HIV prevalence in colleges in Kenya is, however, marred by the limited published data (NASCOP, 2007). No data is available for Kenyan PTTCs as assessment on HIV infection usually focuses on the general population. This has resulted in colleges being sidelined in HIV prevention efforts, most of which are directed at high school and to out of school youth who are considered to be at high risk of infection (Magu, Wanzala, Mutugi, & Ndahi, 2012). Given the context of Kenya, many 20-24 year olds are likely to be attending colleges and universities. Therefore, in the absence of empirical HIV prevalence data on students in public PTTCs (Nzioka, Karongo & Njiru, 2007), one can only logically deduce that some of the students in PTTCs are infected. There also exists confounding evidence that students in tertiary institutions in Kenya engage in unsafe sexual practices to the extent of female students deliberately spreading HIV infection in some universities (Standard Digital, Friday August 24, 2012).

Given the limited focus on colleges and the high rates of risky sexual behaviours, it is important to understand what determines adoption of HIV and AIDS prevention strategies among students in PTTCs. In addition, the limited available information indicates that the HIV and AIDS prevention efforts so far have not produced significant results, hence, the need for this study.

1.3 Purpose of the study

The purpose of the study was to investigate determinants of adoption of HIV and AIDS prevention strategies among students in public primary teacher training colleges in Kenya.

1.4 Objectives of the study

The specific objectives that guided the study were:

1. To establish the HIV and AIDS prevention strategies adopted by students in PTTCs.
2. To determine the influence of selected socio-demographic characteristics on adoption of HIV and AIDS prevention strategies among students in PTTCs.
3. To assess the influence of level of knowledge about HIV and AIDS on HIV and AIDS prevention strategies adopted by students in PTTCs.
4. To determine the extent to which students' sexual behaviours influence adoption of HIV and AIDS prevention strategies among students in PTTCs.
5. To establish the extent to which students' perceptions to risk of HIV and AIDS infection influence their adoption of HIV and AIDS prevention strategies in PTTCs.
6. To determine the relative contributions of socio-demographic characteristics, sexual behavioural factors, knowledge factors and risk perceptions on HIV and AIDS preventive strategies adopted by students in PTTCs.

1.5 Research question

One research question was answered to achieve the study objectives.

1. What HIV and AIDS prevention strategies have students in PTTCs adopted?

1.6 Hypotheses

In order to achieve the stated study objectives, the following null-hypotheses were tested:

H0₁ There is no significant relationship between the following social–demographic characteristics; (a) gender (b) age (c) marital status (d) religion and (e) place of residence and HIV and AIDS prevention strategies adopted by the students in PTTCs.

H0₂ There is no significant relationship between level of knowledge about HIV prevention and transmission and HIV and AIDS prevention strategies adopted by students in PTTCs.

H0₃ There is no significant relationship between sexual behaviours and HIV and AIDS prevention strategies adopted by students in PTTCs

H0₄ There is no significant relationship between perceived risk to HIV infection and HIV and AIDS prevention strategies adopted by students in public TTCs.

H0₅ Socio-demographic characteristics, sexual behavioural factors, knowledge factors and risk perceptions do not contribute significantly to HIV and AIDS prevention strategies adopted by students in TTCs.

1.7 Significance of the study

The purpose of the study was to investigate the determinants of HIV and AIDS prevention strategies among college students in PTTCs. Students in PTTCs are an important target group because over 90 per cent fall within the ages of 18 -24 years; the age at the centre of HIV infection in terms of rates of infection, vulnerability, impact and potential for change (UNFPA, 2010). Research evidence

shows that most young adults engage in sexual behaviours that jeopardise their health. If no attempts are made to study what influences behaviour change within this vulnerable group, then there will be difficulties in designing HIV prevention programmes that are relevant to the group. By exploring what influences adoption of HIV and AIDS prevention strategies among students in PTTCs, it is possible for educators to estimate the extent to which newly recruited teachers will be prepared to act as role models to pupils. As trusted sources of HIV and AIDS information, teachers need to be seen as credible and trustworthy by the pupils. Otherwise, if their sexual behaviours contradict the HIV and AIDS information they give to the pupils, the learners may in turn fail to take the information seriously.

It is imperative to study students in PTTCs because upon graduation, they move to various parts of the country to seek employment. If infected with the virus while in college, they can be dispersal agents of the pandemic. Students in PTTCs are relatively young and when infection is scaled down in young people, the number of life years saved is greatest, thus great human resource for the government. Teachers are also the most important determinant of educational quality. It is estimated that the world will need approximately 18 million additional primary school teachers by 2015 with 3.8 million required in sub-Saharan Africa (Education International, 2009). Therefore, decimation of student-teachers by HIV infection constitutes a waste of investment in education and a challenge to achievement of EFA goals, the MGDs and Vision 2030 in Kenya.

This study was expected to also analyse the influential factors that hinder or facilitate efforts to protect students from the AIDS virus, thereby extending the

theoretical models on prevention of HIV and AIDS. The improved models may provide new insights that may be useful to curriculum developers in designing life skills programmes and HIV and AIDS prevention programmes for college students that address safe sex principles and practices. Such information may also assist college Principals in drafting institutional HIV and AIDS policies within the ambit of their colleges. Additionally, when equipped with adequate information, college students can be important advocates of their specific sexual needs and can introduce more youth sensitive perspectives to policy making process. The study results may also prove an invaluable resource to a wider audience in the education sector including researchers and academicians in their endeavours to mitigate the impacts of HIV and AIDS.

1.8 Limitations of the study

The study was limited by certain conditions that were beyond the researcher's control. One of the study limitations concerns the topic. There is paucity of data on determinants of HIV and AIDS in relation to college students' adoption of HIV and AIDS prevention strategies. Specifically, no Kenyan study has followed this line. To ensure that scarcity of data did not compromise interpretation of results, efforts were made to utilise related literature from other counties and regions.

Data reported in this study represents information on largely self-reported sexual behaviours. Researchers usually question the validity of self-reported measures in data collection given that respondents tend to provide socially acceptable answers rather than reality. To counter this, the researcher recruited research assistants who were of similar ages to the student sample and trained

them on how to create rapport with the participants without being judgemental with regard to respondents' expressed sexual behaviours during the focus group discussions. The respondents who openly showed reluctance, suspicion or displayed distrust on the research were reassured that their identities would remain confidential.

Another drawback was in the survey design employed to collect data. The information on determinants of adoption of HIV and AIDS prevention strategies were measured at one point in time. However, this being a study with academic pursuit it could only be conducted in a cross-sectional format due to time. The results should thus be taken as an indicator of happenings in the population studied. The researcher, being cognisant to the fact that change in behaviour is inherently continuous and lifelong and at best requires a longitudinal study; and that the studied determinants may evolve with changes in time and with exposure to more HIV and AIDS information, employed methodological triangulation in the gathering of data to ensure authenticity of results.

The HIV data for age group intervals was not uniformly reported in the studies and researches. For instance, UNESCO, UNFPA, UNAIDS and GoK studies used 10 year interval (15 – 24 years) while CDC reports used four year intervals (15 – 19 years; 20 – 24 years). Other studies reported information that included very young adolescents (10 – 19 years). This was a challenge in interpretation on reviewed literature results. To ensure comprehensive information on young adults was gathered all such data were referred to in this study. The interpretation of the information should be taken to include this wide variation of young adults.

1.9 Delimitations of the study

The scope of the study was delimited by the researcher in a number of ways. First, due to the large number of potential participants in the study population, the target population involved in the current study focused on second year students in public teacher training colleges with majority falling within the age range of 18-24 years. This age range has been identified as the most vulnerable to HIV infection. The college principals and Deans of students also participated in the study as key informants. Second, the study focused on selected determinants that seem critical to influencing adoption of HIV and AIDS prevention strategies among students. The study was confined to only observing the influences the selected factors had on adoption of HIV and AIDS preventive strategies and nothing on the reverse. Finally, the study was carried out in all the PTTCs in the Republic of Kenya to capture the cultural, religious and environmental contexts that play an important role in variation in HIV and AIDS transmission and prevention across societies and regions.

1.10 Assumptions of the study

The present study was conducted with the following assumptions.

1. That the entire teacher training colleges had fully implemented HIV and AIDS curriculum.
2. That recall bias or deliberate omission of sensitive information on previous sexual behaviours did not affect results of the study.
3. That those respondents who completed instruments in this study understood each question before answering them.

4. That the prevention strategies included in the study would continue to be important to the students in colleges.

1.11 Definitions of significant terms

Definitions of key variables and concepts as used in the study are outlined below to acquaint the reader with their anticipated meanings.

Adoption refers to the cognitive process through which students make decisions to take up and use HIV and AIDS prevention strategies by choice.

Casual sex partner refers to a sexual partner other than a spouse or a boyfriend or girlfriend.

Comprehensive and correct knowledge means that a person can correctly identify the three major ways of preventing transmission of HIV and reject three most common misconceptions about HIV transmission and know that a healthy looking person can have HIV.

Concurrent multiple sex partners refers to a situation whereby a person has sex with several other people within the same space of time.

Consistent correct condom use refers to always using condoms correctly during sexual intercourse.

Determinant refers to a factor that has a decisive influence on results or outcomes.

Epidemic refers to a disease that affects a large number of people in a place and spreads quickly to other areas.

Incidence refers to the number of people who became infected over a specific period of time, usually, the preceding year.

Higher-risk sex refers to sex with non-marital, non-cohabiting partner or sex with multiple partners.

HIV infection refers to a state of having acquired the AIDS causing virus.

HIV and AIDS prevention strategies refer to both biomedical and behavioural methods adopted by a person in order to keep free from HIV infection including; abstinence, fidelity and consistent, correct condom use, prompt treatment of STDs and STIs and testing for HIV seropositivity.

HIV risk perception refers to the respondents' current and future opinions of their chances of contracting HIV and AIDS.

Knowledge factors refer to knowledge about HIV and AIDS prevention strategies, transmission routes and sources of HIV and AIDS messages

Pandemic refers to an occurrence of a disease that affects many people over a very wide area.

Place of residence refers to a students' principal or primary home or place of abode, that is, home or place in which his or her habitation is fixed and to which he or she whenever absent from college returns to.

Prevalence refers to the total number of people living with HIV irrespective of when they were infected.

Regular sex partner refers to a spouse, a boyfriend or a girlfriend.

Safe sex practice refers to taking precaution during sex that can prevent one from contracting a sexually transmitted disease including AIDS virus.

Self efficacy refers to the confidence a person feels about performing a specific behaviour such as insisting on using a condom during sexual intercourse.

Serial monogamy refers to the rapid change of sexual partners but ensuring one has only one sexual partner at a given time.

Sexual behaviour refers to the sexual activity of an individual as observed by others and as distinguished from a subjective or inner perspective of one's own sexual acts.

Social-demographic characteristics refer to the quantifiable statistics of a population that are used to identify and characterise that population at a given time.

Unprotected sex refers not using a condom when having sex with someone else (not regular partner).

Young adults refer to people in the age cohort of 18 – 30 years.

1.12 Organization of the study

The study is organized into five chapters. The initial chapter of the thesis, introduction, outlines the general background of the study, statement of the problem, study purpose, objectives of the study, research questions and hypotheses and study significance. In addition the chapter includes the limitations and delimitations of the study, basic assumptions and defines concepts and terms that are relevant to the study. Chapter two provides a detailed epidemiological context of HIV and AIDS, thematic presentation of empirical overview of relevant literature on the study variables, theoretical framework of the study and the conceptual framework on which the study is based.

Chapter three is descriptive presenting the methodology of the study. It comprises of the research design, study population, sample size and sampling procedures. Additionally, the research instruments are described in details and

their validity, reliability and administration procedures discussed. The ethical considerations undertaken and the data analyses techniques employed are also discussed in this chapter. Chapter four focused on data analysis, interpretation and discussion. The fifth chapter of the thesis includes summary of the study, conclusions reached at, general and specific recommendations to the study audiences and suggestions for further research.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

The chapter presents the reviewed empirical and conceptual literature relevant to the study. Information is presented thematically starting from general overview about HIV and AIDS pandemic to specific themes related to the study variables. The themes revolve around HIV and AIDS prevention strategies adopted by college students. Determinants such as: socio-demographic characteristics; knowledge factors; sexual behavioural factors; and perceptions of risk to HIV infection that influence students' to adopt the strategies are discussed in details. Three theories and a model that provided the theoretical framework to the current study are explained here. A conceptual framework that guided the study and a summary of the chapter are presented.

2.2 A general overview of HIV and AIDS

The origin of AIDS remains obscure and many theories have been advanced to explain the root of the AIDS causing virus. Controversy over HIV and AIDS origin still rages viciously with some theories being refuted and none so far having been fully accepted (Curtis, 2007). The theories include the highly acclaimed oral polio vaccine theory that linked AIDS with the polio vaccine from chimpanzee kidney in Congo. However, this theory has since been refuted (Hopper, 1999; Woroby et al; Santiago in Fisher & Madden, 2011). Other controversial theories contend that HIV was as a result of medical experiments while others still suggest that CIA manufactured the deadly virus or that the virus was genetically engineered (FoundCare, 2014; The AIDS Institute, 2011).

So far it is not yet clear when the virus first attacked humans neither is it clear where the first AIDS case occurred; Africa or America. What is clear from literature is that the virus emerged in the 20th century and it causes the disease AIDS that has since become an epidemic (Found Care, 2014). After initial cases of AIDS were reported, the disease expanded rapidly to an epidemic because of a combination of different simulation factors including: liberation of sex behaviour, mass tourism, general mobility of people, development of Anti-retroviral drugs, increased use of intravenous drugs among others (Loytonen, 1993).

For a person to get HIV infection, the virus must enter the bloodstream of that person. The virus is highly volatile and cannot exist outside the host cell. As a retrovirus, HIV multiplies itself inside the cells it affects (Murah & Kiarie, 2001). One of the targets for the virus is the white blood cell called centre for differentiation (CD4) cell which is vital for fighting infections in the human body. Once inside the CD4 cell, the HIV virus makes many copies of itself, consequently, causing slow but constant damage to the immune system. This in many cases leads to development of AIDS; and the body becomes vulnerable to life threatening illnesses called 'opportunistic diseases' and cancers (Murah & Kiarie, 2001).

A person is said to have progressed to AIDS if a diagnosis is made of certain opportunistic infections or if the CD4 count drops below 500 cells/mm(Centre for Disease Control and Prevention). Without any treatment, a person can survive for three years after developing AIDS. It is the opportunistic infections that cause illness or death in HIV positive people – but not the virus itself. Zopola et al., (2009) contend that on average people take 8 to 10 years to progress to AIDS

without any HIV therapy but with drug therapies, the onset of AIDS can be delayed even longer. Today, the number of people living with HIV and AIDS has increased due to the advances made in medicine that prolong lives of HIV positive people thereby reducing the number of HIV related deaths (AVERT,2012).

The body fluids that contain enough viruses to infect a person are; blood, semen, vaginal fluid, menstrual fluid, and breast milk (Murah & Kiarie, 2001; CDC, 2003). Transmission routes of the HIV include unprotected penetrative sex with an infected partner, sharing contaminated needles, blood transfusion with infected blood and mother to child transmission during delivery or when breastfeeding. Of these known transmission routes, heterosexual contacts accounts for between 70 to 90 percent of all HIV infections (Lamprey, 2002; UNAIDS, 2004; Yole, 1994). HIV infection is not passed through ordinary contact such as; hugging, kissing, sharing utensils and toilets, or shaking hands with HIV positive people (<http://www.mayoclinic.com/health/hiv-aids/...>).

2.3 HIV and AIDS and young people in sub-Saharan Africa

The AIDS pandemic has been recorded as the number one cause of death in Africa, particularly sub-Saharan Africa, and the fourth leading cause in the world (WHO, 2008; World Bank, 2003). Since its advent, the pandemic's enormity and devastating impacts have reverberated in all human spheres. These include; health sector, education sector, households, workplaces and economies destroying hard-earned gains consolidated over the years (AVERT, 2008).

Global statistics show that since the first diagnosis of HIV and AIDS, approximately 70 million people have been infected with the virus and about 35

million people have died from AIDS related diseases (UNAIDS, 2012a; WHO, 2013). The UNAIDS and WHO reports show that the global percentage of adults living with HIV by the end of 2011 was still very high (34 million people). The new HIV infections (2.5 million) and AIDS-related deaths (1.7 million) that occurred in the same year are a further indicator that the fight against HIV and AIDS is far from won.

Statistics hold that HIV and AIDS prevalence and infection rates among 15-24 year olds have remained high. About 5.4 million out of the 1.7 billion young adults worldwide were estimated to be HIV positive in 2006 (UNAIDS, 2007; UNFPA, 2008). An estimated 500,000 new infections occurred daily accounting to about 40 per cent of the new infections that year (UNFPA, 2008). In 2009 the rate decreased to 35 percent and over time, the number of those infected seem to have stabilized at 5 million (4.4 million - 5.9 million). Daily new infections are now approximated at 2,400 cases (UNAIDS, 2011; UNFPA, 2011). However, the grip of HIV and AIDS is deadliest among the young adults in sub-Saharan Africa. In 2010, a half (2.6 million) of all new infections in SSA happened among the youth of between 15 to 24 years with 5 young adults acquiring HIV infection every minute (UNAIDS, 2011). Experts estimate that in hyper-endemic countries like Botswana, Lesotho and Swaziland, more than 1 in 10 young people are infected (UNFPA, 2010).

This is not surprising given that SSA has the highest HIV prevalence rate (4.9%) as compared to other regions. For example, in East Asia (0.1%); South East Asia (0.3%); and Western and Central Europe (0.3%) adult prevalence percentages are almost insignificant (CDC, 2012; Henry J. Kaiser Family

Foundation, 2011 and WHO, 2012). In 2011, SSA had a total of 23.5 million people living with HIV which accounted for two thirds (69%) of all people infected globally (WHO, 2012). Three quarters (1.5 million) of all AIDS deaths also happened in SSA in 2011. Additionally, a worrying 35 percent of the global new HIV infections occurred in SSA in 2011 (WHO, 2012).

Within the sub-Saharan region, the Eastern and Southern African (ESA) countries remain the epicenter of the pandemic. At national level, nine countries with the highest HIV adult prevalence are in Southern Africa region with 34 percent of all people infected with HIV and AIDS residing there (UNAIDS, 2011; WHO, 2012). The countries include; Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, and Zambia; all with an adult HIV prevalence of over 10 percent. These countries have continually shouldered a disproportionate share of the global HIV and AIDS burden.

Kenya is one of the ESA countries where HIV prevalence levels have stabilized at significantly high levels. It has the third largest population of people living with HIV (1.6 million people) and the highest HIV prevalence outside Southern Africa region (UNAIDS, 2008). Epidemiological trends indicate that in Kenya, the HIV prevalence levels rose steadily from 2.5 percent in 1990 to 10.2 percent in 2000 peaking at 15 percent in 2002 (NCPD, 1998; UNAIDS, 2003; WHO, 1997). The levels then dropped sharply to 6.7 percent in 2003 (Kenya Health Demographic Survey [KDHS], 2003) before rising again to 7.1 per cent in 2007 (Kaiser Daily HIV and AIDS Report, 2008; National AIDS/STI Control Programme [NASCOP] Final Report, 2009). The HIV prevalence has since dropped to 6.3 percent where it seems to have stabilised for the last several years

(NACC & NASCOP, 2012). The number of new infections has also remained at 0.5 per cent (100,000 people) annually (NASCOP, 2012). Notwithstanding the declining trend, the HIV prevalence level and the number of annual new infections are unacceptably high; an indicator that HIV and AIDS is still a severe problem in Kenya.

Kenya experiences what is referred to as 'a generalised epidemic'. This means that the disease is no longer confined to discrete groups but has rather spread to the general population (UNESCO, 2012). Therefore, any single sexual encounter carries substantial likelihood of HIV infection. Sexual transmission has been recorded as the commonest way of passing the virus and accounts for 93 per cent of all new infections with heterosexual sex representing 77 per cent of new incidences in Kenya (Kenya National Bureau of Statistics [KNBS], 2010).

The Kenya National Bureau of Statistics (2010) report captures the current Kenyan HIV and AIDS status. The KNBS (2010) report is a comprehensive summary of Kenya Demographic and Health Survey 2008-09 compiled in partnership with NACC, NASCOP and Kenya National Bureau of Statistics (KNBS). Statistics show that women aged 20–24 years are over four times (6.4%) more likely to be infected than men (1.5 %) of the same age. In addition, young women possess lower comprehensive correct knowledge levels (48%) than their male counterparts (55%), but they are more likely than men to test for HIV (41% vs. 26%). Between 2003 and 2008/09, condom use increased from 25 percent to 40 percent for young women; and from 47 percent to 64 percent for young men among the 15–24 year olds (KNBS, 2010). Condom distribution also increased by

a third between 2007 and 2009 with 15 million condoms being distributed annually (KNBS, 2010).

When data were disaggregated by gender and area of residence results showed that urban people are more likely to have HIV infection (7%) than rural ones (6%); and urban women (10%) and men (5%) are at a considerably higher risk of HIV infection than rural women (7%) and men (4%). Contrary to the skew on prevalence and risk levels, rural residents initiate sex earlier than urban residents. By the age of 18, 60 percent of rural men and 50 percent of rural women had initiated sex compared to 51 percent and 39 percent of urban young men and women (NACC & NASCOP, 2012). Comparison of data in the NACC and NASCOP national demographic surveys revealed little change in percentage of people who engage in higher risk sex (KNBS, 2010).

2.4 HIV and AIDS policy framework on HIV prevention

Badcock-Walters, Kelly and Gørgens (2004) opine that preventive medicine is an investment to be leveraged rather than a cost to be justified. The international community seems to have long taken this cue and has demonstrated unwavering support in the fight against HIV infection especially among young adults. This is seen in most international agendas that carry youth specific HIV prevention messages.

Some of the significant policies that carry youth specific messages include the Dakar Framework for Action for Education for All that was adopted by the international world community. The policy draws attention to the need to scale down the spread of HIV and AIDS for EFA goals to be achieved (UNESCO, 2000). The United Nations General Assembly Special Session on HIV and AIDS

(UNGASS) Declaration of Commitments reiterated the need to eliminate HIV and AIDS by reducing infection in persons aged 15 - 24 years by 75 percent globally by 2010. Participating governments agreed to ensure that by 2005 at least 90 percent and by 2010, 95 percent of young adults of 15 - 24 years would possess comprehensive and correct knowledge necessary to develop the life skills required to reduce vulnerability to HIV infection (UNAIDS June, 2001). Later in 2005, Heads of States and Governments agreed to scale up national response to achieve universal access to comprehensive prevention programmes, treatments, care and support (United Nations, 2006). Additionally, goal 6(a) of the Millennium Development Goals (MGDs) states that the world should halt and begin to reverse the spread of HIV by 2015 (United Nations Official website, 2000).

The Kenya Government is a signatory to these international protocols on HIV and AIDS prevention and has shown great commitment in fighting new infections. This commitment is enshrined in a number of policy documents which embrace prevention, care and support for the infected and affected using the 3M approach (multi-sectoral, multi-disciplinary and multi-stakeholder). The approach addresses factors that determine the profile of HIV and AIDS including; biological, behavioural, social-demographic, socio-cultural and socio-contextual factors.

At the national level, the government first developed the Sessional Paper No. 4 of 1997 on HIV and AIDS that saw the pandemic declared a national disaster in 1999 by President Daniel Arap Moi. Thereafter, the National AIDS Control Council (NACC) was formally established through the Presidential Order Legal Notice No. 170 of 1999 to coordinate HIV and AIDS activities. Subsequent

Strategic Plans have strengthened the HIV and AIDS prevention and control programmes in Kenya. They include: The Kenya National HIV and AIDS Strategic Plan of 2000/2005; 2005/6 – 2009/10; and 2009/10 – 2011/13. The latest, 2009/10 -2011/13 strategic Plan, was developed after a careful analysis of the Mode of Transmission (MoT) study in 2008 and the KAIS study of 2007. The strategy addresses the need to reduce the number of new infections by 50 percent by 2013 as one of its four impact results (National AIDS Control Council, 2009).

Within the education sector there is an Education Sector Policy on HIV and AIDS that guides in the implementation of HIV and AIDS curriculum across the education sector (Republic of Kenya, 2004). One of the policy's primary objectives is to ensure that teacher education curriculum fully prepares educators to respond to HIV and AIDS within their own lives and as professionals, build positive attitudes and skills for HIV and AIDS prevention and control among all their learners. In 2005, the Ministry of Education, Science and Technology (MOHEST) implemented a five year HIV and AIDS plan under the Kenya Education Sector Support Programme 2005-2010 to strengthen MOE capacity to provide HIV and AIDS prevention, care, support and mitigation interventions (MOE, 2006). Efforts to reduce new infection in young adults is further demonstrated in the introduction of life skills education (LSE) as a stand-alone subject in primary, secondary and teacher training institutions (KIE, 2009). Life skills education is acclaimed as a key strategy in the prevention and management of HIV and AIDS (UNICEF, 2004).

The education sector and the students in PTTCs are central in the fight against the pandemic for the mere fact that most children in most countries spend a

substantial part of their lives attending primary school education. Students in PTTCs interact with these children upon graduation. Most of the pupils are usually between 6 – 14 years; an age range with the lowest HIV prevalence worldwide (UNAIDS, 2008). Such a cohort presents a window of hope in eliminating HIV and AIDS (World Bank, 2002). The UNAIDS/WHO (2004) recognise the education sector as one of the most effective and efficient pathways of reaching out to a large number of uninfected people with HIV prevention messages, thereby, arresting possible future infections.

Most policies on HIV and AIDS delineate at least three responsibilities for teachers: creating preventive awareness of the pandemic by providing relevant knowledge and/or enhancing better understanding; promoting attitude development and change; and ensuring that learners develop skills that allow them to be competent and assertive in managing relationships and sexual issues (UNESCO, 2002). This requires students in PTTCs to possess adequate and correct knowledge about HIV and AIDS and practice safe sex behaviour themselves first so that in turn they can disseminate and role model the same to the pupils. The students should, therefore, choose effective HIV prevention strategies to remain safe from the AIDS virus.

2.5 Selected HIV and AIDS prevention strategies

The predominant mode of HIV and AIDS transmission is heterosexual contact (Kapakora, 2003; UNAIDS, 2008). As a result, most prevention programmes encourage people to reduce risk of acquiring the AIDS virus by changing their sexual behaviours. This includes use of prevention strategies such as; Abstinence or delayed sexual debut (A), Be faithful to one uninfected partner (B) and using

Condoms consistently and correctly (C) if sexually active (UNAIDS, 2006). The 'ABC' strategy is associated with reduced transmission of HIV among sexually active people both in epidemiological modelling studies (Morris & Kretzschmar, 1997) and in other research endeavours (Shelton, Halperin, Nantulya, Potts, Gayle, et al. 2004; Singh, Darroch & Bankole, 2003; UNAIDS, 2001). The three strategies have been lauded as the most effective in prevention of HIV infection.

Besides these strategies, others include; testing for HIV status, enquiring the sexual history of a sexual partner, prompt treatment of STIs, voluntary medical male circumcision (VMMC) and use of ARVs (drugs) for the already infected individuals. These strategies are not effective on their own and need to be used in combination with others. While most people are aware of these prevention strategies, adherence has been a challenge probably because of the complexity and sensitive nature of the sexuality issues embedded in HIV transmission modes (CDC, 2011). Following is a discussion of few of the strategies.

2.5.1 Abstinence or delayed sexual debut

Abstinence refers to delay in the onset of sexual intercourse and/ or celibacy. Literature recognises two predominant approaches to this strategy; abstinence only (also referred to as abstinence-only-till marriage) and abstinence-plus (also called comprehensive sexual education). On the one hand, abstinence-only approaches present abstinence as the exclusive means of preventing HIV infection and other sexually transmitted infections without encouraging condom use or other prevention strategies. On the other hand, abstinence-plus approaches encourage abstinence among young people and also provide information about

contraceptives and HIV prevention methods among those who become sexually active.

Studies have indicated that while complete sexual abstinence is the safest way of preventing sexual transmission of HIV, a large number of adults and adolescents fail to adopt this strategy (Bearman & Bruckner, 2004; Hubley, 1995). Indeed abstinence-plus approaches are more popular than the abstinence-only because they recognise that not all young people are abstinent (Kirby, 2001; Montgomery & Operario, 2007).

2.5.2 Being faithful to an uninfected partner

In the 'ABC' model, 'Be faithful', involves partner reduction as well as strict monogamy. Arya and Hart (1998) add that the strategy also includes a decrease in the rate of sexual partners' change and/or remaining faithful in a polygamous marriage. The strategy is lauded as the second best after abstinence if practised consistently. However, it has also been labelled "The neglected middle child of 'ABC' due to scarcity of research on the strategy (Shelton et al., 2004).

The 'Be faithful' strategy is central in the control of the spread of HIV infection because the rate of spread of HIV in a population depends on: the rate of partner change; whether relationships are concurrent and consecutive; and whether partners are drawn from the local area or further afield, that is, the established sexual 'networks' If a few links from the networks are removed, the chain of infection is broken (Potterat et al. 2002). Garnett (1998) opined that heterogeneity in sexual behaviour is vital to generate a high sexual activity 'core group' within which HIV spreads rapidly. The spread of the virus outside of the

core group in return depends on the extent to which the group interacts with the rest of the population.

Reducing the rate of partner change is important in that it reduces the number of times people are likely to come across partners in early HIV infection. Phylogenetic testing indicates that anything from 10 to 50 percent of HIV infections may be transmitted by people in the first few months of HIV infection (Brenner et al., 2005). For instance, Hayes and White (2006) using data from Rakai in Uganda estimated infection rates during different stages of HIV infection and found that about 41 percent of transmission occurred during the first five months of seroconversion.

Besides high rates of partner change, concurrent partnerships fuels the spread of the virus. Halperin (2007) demonstrated the association between number of sexual partners and HIV infection and concluded that decreasing the number of sexual partners may have an effect on reducing HIV incidence. Although faithful relationships are ideal, they are nevertheless complex and difficult to achieve as acknowledged by the 14-20 year old discussants in a qualitative study conducted by Baumgartner, Lugina, Johnson and Nyamhanga (2010) in Tanzania.

2.5.3 Condom use

The male latex condom is lauded as the single, most efficient, available technology to reduce the sexual transmission of HIV and other sexually transmitted infections (CDC, 2010; Cohen, 2011). Laboratory studies show that HIV virus cannot pass through a condom: even water and air molecules which are much smaller than the virus cannot pass through a condom (CDC, 2013; National Institute of Allergy and Infectious Diseases, National Institutes of Health &

Department of Health and Human Services, 2001; and Weller & Davis-Beatty, 2002). An analysis conducted by the US National Institute of Health (2001) on several studies on condom effectiveness revealed that consistent correct condom use can reduce an individual's risk of HIV infection and transmission by 85 percent. Hendriksen, Pettifor, Sung-Jae Lee, Coates and Ree, (2007) retaliated that for persons who are sexually active, correct and consistent use of condoms is the most effective strategy to reduce their risk of exposure to HIV, other sexually transmitted diseases and unwanted pregnancies.

Systematic reviews examining HIV prevention interventions posit that although condom use is a common outcome measure used to assess changes in HIV-related behaviours, no widely accepted standards exist for its measurement. Researchers commonly measure albeit in different ways; condom use at last sex, frequency of condom use, and number of protected sex acts (Fonner et al., 2013; Johns Hopkins Bloomberg School of Public Health, WHO& Medical University of South Carolina, 2012). The unstandardized measures make comparability of findings across studies difficult as experienced in this study.

Developed countries report higher condom use than developing ones. However, gender differences exist with studies showing less than 50 percent condom use among females. In the United States, 67 percent of males and 49 percent of females reported using condoms always between 2006 -2010 (Wetti, Wildsmith, & Manlove, 2011). In contrast to these high levels, a study released by the Sex Information and Education Council of Canada found that nearly 50 percent of sexually active college students were not using condoms.

Maticka-Tyndale (2012) in a review of research published between late 1980s and 2011 on how condoms fit within sexual relationships concluded that although sub-Saharan Africa has the world's highest rates of HIV infection, condom use was generally low. This is corroborated by The World Bank Group (2013) analysis on the percentage of the population aged 15-24 years in African countries that had used a condom at last intercourse in the last 12 months prior to national demographic surveys. The results showed low to moderate condom use. For instance, the percentage that had used a condom within the period measured by the study was: 57 percent in Senegal in 2011; 56 percent in Kenya in 2009; 52 percent in Zimbabwe in 2011; 42 percent in Tanzania in 2012; 37 percent in Rwanda in 2010; 37 percent in Malawi in 2010; and 25 percent in Ethiopia in 2011. This is despite the fact that in most countries, condoms are provided free of charge by governments and are available to young adults through a number of venues, including public-sector clinics and youth centres (Pettifor, Rees, Steffenson et al.: in Hendriksen, Pettifor, Sung-Jae Lee, Coates, & Rees, 2007).

When data are measured for consistent condom use, the percentages are usually much lower (<http://www.irinnews.org/report/96359/u>). Research shows that while young people are likely to use a condom the first time they have sex, their behaviour becomes inconsistent after that. In one study women were found to gradually use condoms less frequently during their first year of college (The Miriam Hospital's Centres for Behavioural and Preventive Medicine, 2013).

Research indicates that tertiary education students generally do not practice correct and consistent use of condoms. Asekun-Olarinmoye and Oladele (2009) in Nigeria found a high level of awareness of condoms and a largely positive

disposition to condom use among undergraduate students. However, this did not translate to significant consistent condom use. Similar findings were recorded by Olaseha, Ajuwon, et al. (2004) in Botswana; Adefuye, Abiona, Balogun and Lukobo-Durrell (2009) in a study among African-Americans; and Kalichman, Simbayi, Cain and Jooste (2009) in South African. In a study to identify behavioural and psychosocial correlates of condom use among Chinese university undergraduate students, only 40 percent of out of the 1,850 sexually active students reported frequent condom use (Ma Q, 2009).

2.5.4 HIV testing

Testing for one's sero-status is critical for HIV prevention. People who know their HIV status are more likely to protect themselves and their partners from infection than those who are not aware. In a study conducted in Kenya, Tanzania and Trinidad it was found that men and women who learnt their sero-status or that of their partner were significantly more likely to practice safer sex (Lancet, 2000).

However testing of HIV has been low among young adults aged 15 to 24 years. UNESCO reports show that about 60 percent of young adults do not know their HIV status. Empirical research on college students further confirms this. For instance, a study conducted in the University of Benin revealed that only 42.4 percent of the students knew their HIV status (Oboro, Azodo, & Sede, 2010). In another study, Crosby, Miller, Staten and Noland (2005) in a cross-sectional survey of college students in the University of Kentucky found that only 22.5 percent had ever tested for HIV. Kenya's results in the general population shows significant increases in HIV testing and counselling over the years; from 1.7 million in 2005 to 4.6 million cumulative cases (KAIS, 2009).

2.5.5 Prompt diagnosis and treatment of STDs and STIs

Sexually transmitted diseases (STDs) and sexually transmitted infections (STIs) are illnesses that are transmitted between people by means of sexual activity such as vaginal intercourse, anal sex and oral sex. Some STDs and STIs can also be contracted by sharing intravenous drug needles with infected persons, as well as through childbirth or breastfeeding (PLWHA/National AIDS Resource Center, 2013). Sexually transmitted infection is a broader term than sexually transmitted disease. Infections are caused by parasitic species which may not cause any adverse effects while in a disease, infections lead to impaired or abnormal functions. In either case, a person may or may not exhibit signs or symptoms (CDC, 2013).

Many STDs and STIs are easily transmitted through the mucous membranes of the penis, vulva, rectum, urinary tract and less often the mouth, throat, respiratory tract and eyes (Naidu, 2009). Sexual activities that involve contact with the bodily fluids of another person contain some risk of transmission of STDs and STIs. That is, all sexual activities between two (or more) people should be considered as being a two-way route for the transmission of STIs, that is, "giving" or "receiving"; both of which are risky although receiving carries a higher risk (CDC, 2013).

It is estimated that more than one million people contract an STI daily. There exists evidence that infection with STDs and STIs increases the risk of HIV infection and transmission by at least two to five times (Institute of Medicine, 1997). Empirical studies have demonstrated that prompt diagnosis and treatment of STDs and STIs reduces HIV risk. For instance, in Tanzania, prompt treatment

of STDs and STIs reduced new HIV infections by 38 percent (Grosskurth et al, 1995). However, when intermittent diagnosis and treatment was provided to community-wide mass every 10 months in Uganda, conflicting outcomes were recorded. There were no decreases in HIV infection (Wawer, 1998). WHO/UNAIDS consultation presented at the XVI International AIDS Conference in August 2006 argue that the two studies were conducted in different settings and at different stages of the HIV epidemic. Uganda by the time of the study had a generalized HIV of 16 percent unlike Tanzania whose HIV prevalence was 4 percent. Therefore, the findings should be interpreted to confirm that treating for STIs at the right stage of an epidemic and targeting key population groups can reduce HIV transmission.

2.6 Socio-demographic variables and adoption of HIV prevention strategies

Demographics are the quantifiable statistics of a given population and are used to identify and characterize that population at a specific point in time. Commonly examined demographics include; gender, age, ethnicity, marital status, educational levels, disabilities, mobility, area of residence/location, home ownership, employment status, and religion and/or religiosity (source). Demographics can be viewed as the essential information about the population of a region and the culture of the people there.

HIV infection rates depend partially on demographic determinants that are beyond individual control such as age and gender. UNICEF/NYHQ (2008) asserts that the face of HIV and AIDS is young and female. Equally, UNFPA (2010) contend that interventions must be tailored to meet young peoples' individual characteristics that may influence an individual into adopting a HIV and AIDS prevention strategy.

2.6.1 Gender and its influence on HIV prevention strategies

Gender can be understood as the different roles, expectations, identities, needs, opportunities and obstacles that society assigns to women and men based on sex (Rao-Gupta, 2000; UNFPA, 2011; WHO, 2003). Sex is biological, but gender is socially-ascribed. Gender determines how individuals and society perceive what it means to be male or female, thereby, influencing one's roles, attitudes, behaviours and relationships. These aspects influence one's personal identity that may have a direct bearing in sexual decision-making and adoption of HIV and AIDS prevention strategies (UNFPA, 2011).

Gender issues and spread of HIV infection seem inter-twined. Ambassador Eric Goosby, the United States HIV and AIDS Global AIDS Coordinator, opined that HIV and AIDS impacts men and women differently; an issue linked with and affected by gender inequality. He asserted that success in fighting the epidemic is tied to ability to recognize and respond to gender inequality (PEPFAR, 2013). These sentiments had earlier been voiced by the former UN Secretary General, Kofi Annan on 29th Dec., 2002 when he said that HIV and AIDS has ‘Face of a woman’.

Literature shows that feminisation of HIV epidemic starts at an early age with the risk of becoming infected being disproportionately higher for girls and young women than for boys and young men. This is partly due to culture where women and girls are expected to be passive and ignorant on sex issues. This may constrain their negotiation for safe sex including condom use (Pearson, 2006). Gender and HIV-related research affirm involvement of women in unwanted sexual encounters due to their inability to refuse such encounters (UNAIDS, 2009; 2010).

Global statistics further affirms the feminisation of HIV and AIDS. In 2010 young women had a 22 percent HIV prevalence out of the 42 percent of the new HIV infections that happened in the 15-24 year olds worldwide (UNAIDS, 2011a). The situation has not improved and as by end of 2012, 52 percent of people living with HIV and AIDS in low and middle- income countries were women (UNAIDS, 2013). It is also estimated that a young woman gets infected with HIV every single minute (UNAIDS, 2012). The situation is worse in ESA region where HIV prevalence among young women aged 15-24 years is 2^{1/2} times

higher than that of young men of the same age. In Swaziland, for example, 15.6 percent of young women were HIV positive, compared to only 6.5 percent of young men in 2010 (UNAIDS, 2011a).

The skewed data could also be as a result of the assumptions that underlie many HIV and AIDS prevention strategies. It is assumed that people are free to make empowered choices and can opt to abstain from sex, stay faithful to one's partner, use condoms consistently or test for HIV. However, as empirical findings show, women and girls face a range of HIV-related risk factors and vulnerabilities that are embedded in the social relations and economic realities of the societies that prevent them from making such free choices against HIV infection (UNFPA, 2004). In addition, many AIDS programmes have for a long time ignored women's prevention strategies against HIV infection (Watkins, 2004).

Gender expectations also affect men and boys by encouraging risk-taking behaviour, discouraging access to health services, and narrowly defining their roles as partners and family members (UNFPA, 2012). Some societal expectations encourage men to have frequent sex usually with multiple partners and exercise control over women. These behaviours can pose challenges in HIV prevention efforts. Men may force sex on unwilling women and they may at the same time refuse to use condoms (Njeru, Mwangi & Nguli, 2004). Surveys in Swaziland, Tanzania, Zimbabwe, and Kenya reveal that 28 to 38 percent of girls and 9 to 18 percent of boys report forced sexual intercourse before the age of 18 (WHO, 2004). Sexual violence increases the risk of HIV infection among women by up to three times (<http://www.unfpa.org/gender/violence.htm>).

It is evident that men and women respond to HIV and AIDS prevention strategies differently. Studies have shown gender differences in condom use with women showing greater condom use self-efficacy than men (Res & Stephens, 1998). However, even where women are seen to play a more active role in negotiation of condom use than men, condom use was found to be low among college women (Carter, McNair, Corbin & Williams, 1991). In addition, some studies have found no gender differences (Carroll, 1991). For instance, Magu et al. (2012) studied youth between 18-24 years in Kenyan universities and found a significant relationship between gender and condom use ($p < 0.001$) in both male and female. Multivariate analysis showed that gender was a significant control variable when explaining the variability of condom use younger age group only. A few have found that men have greater condom use self-efficacy (Farmer & Meston, 2006; Treise & Weigold, 2001). In US, 67 percent of males and 49 percent of females reported using condoms always between 2006 and 2010 (Wetti, Wildsmith, & Manlove, 2011).

Success has been registered with the use of ABC strategies in Uganda where women seemed to have low sexual bargaining power at the onset of HIV and AIDS. In Zambia and Kenya, ABC strategies have brought about behavioural changes among young adults as evidenced by the reducing rates of HIV incidence but with gender differences (Bessinger, Akwara, & Halperin, 2003; KAIS, 2007; Kenya Demographic and Health Survey, 2003). Thailand, likewise, has succeeded in promoting and requiring condom use in brothels, and in bringing about changes in faithfulness and partner reduction among the general population particularly

young men (UNAIDS, 2004). Gender issues, therefore, are a requisite study if HIV and AIDS prevention efforts are to succeed.

2.6.2 Age as a determinant of adoption of HIV prevention strategies

Empirical evidence indicates that people who start practising sex early increase their probability of contracting the AIDS virus, are likely to have many partners and are less likely to use condoms than those who delay sexual initiation (WHO, 2004). In developed and developing countries, most college students fall within ages 18-30. In the United States, college students are within the ranges of 18-25 years (Jing, Soyeon, Barber & Lyons, 2007) while in Kenya they fall within 18-30 years (Ojundo, 2003). Jing et al, label this stage 'emerging adulthood'. The stage is important because major life changing experiences including behaviours toward sex life occur at this stage. The age range is also known to be the most vulnerable to HIV infection (UNAIDS, 2010).

Surveys show that about 70 percent of college students are sexually active (American College Health Association, 2007). It is also extrapolated from epidemiological studies that a large number of college students are not using protection as evidenced by the high prevalence of HIV infections (UNAIDS, 2011/12) and the high numbers contracting STDs/STIs (<http://healthland.time.com/2013/11/12/no-condom-culture-why-teens-arent-practicing-safe-sex/#ixzz2ldTI4d>) among the 15-24 year olds. In America, it is estimated that half of all new STDs/STIs infections occur among young people. Americans ages 15 to 24 contract chlamydia and gonorrhoea at four times the rate of the general population, and those in their early 20s have the highest reported cases of syphilis and HIV (CDC, 2011).

Generally, in sub-Saharan Africa about 80 percent of young adults become sexually active before they reach age 20. Khan and Mishra (2008) posit that evidence from Demographic and Health Surveys and the AIDS Indicators Surveys show that median age at first sex among 20–24-year-old women ranges from a low of 16 years or younger in Chad, Mali and Mozambique to a high of 19.6 in Senegal. A national study conducted in Kenya indicated that the median age at sexual debut for women was 16.8 to 17.8 while that of men was 16.8 to 17.1 years (NACC, 2008). In Nigeria, Torimiro et al (2007) reported even much lower mean ages of sexual debut for males (13.4 years) and females (12.8 years) with a standard deviation of 2.4 and 2.1 respectively.

Even in developed countries, youth initiate sex at an early age. Paiva, Calazans, Venturi, and Dias (2005) found that in Brazil, 61.6 percent of young interviewees had practiced sex at a relatively early age of about 14.9 years for both sexes. In the United States of America, the average age of first sexual intercourse is 17.0 for males and 17.3 for females (Kinsey Institute, 2013). Such early sexual initiation only means that a great percentage of young people are not abstinent thereby getting exposed to the dangers of HIV and AIDS at an early age; a time when it is difficult to make informed choices on sexual matters due to limited exposure to the world of adulthood.

Ezekiel (1993) in a study involving university students found age to be an important determining factor in condom use. However, their utilisation by young people has been reported with conflicting results. Most studies indicate that young adults have higher rates of consistent condom use compared to older adults (sources). Chimbindi, McGrath, Herbst, Tint and Newell (2010) in a study of 15-

24 year olds in Kwa- Zulu Natal, found that consistent condom use declined with 10 percent with each one year increase in age.

Available literature shows that a significant number of young adults report having multiple partners. Desiderato and Crawford (1995) studied 427 undergraduate students in Virginia and found that of the 262 sexually active students, 66 percent had more than one sexual partner. MacDonald et al (2010) studied a total of 5514 students in first-year community college and university classrooms across Canada to assess STD/HIV-related knowledge, attitudes, and risk behaviour. The students' mean age was 19.7 years. Of the 74.3 percent of the men and 68.9 percent of the women who were coitally active, 21.3 percent of the men and 8.6 percent of the women had 10 or more partners.

2.6.3 Marital status

Recent sentinel surveys indicate that HIV prevalence among women who are married, divorced, separated, or single do not necessarily show the differences in prevalence one would expect. In fact, data from 2006 found that marriage did not seem to protect women attending anti-natal clinic in urban centres from HIV infection. This is because in relationships, including marriage, not all partners are faithful all of the times.

Surveys show that whereas single women may have ability to negotiate for safer sex; married women may not (KDHS, 2003; Mbizvo & Basset, 1993). It is usually difficult for married women to insist in condom use. Consequently, HIV infection rates are significantly higher among them than among single women. For instance, in Zimbabwe, HIV prevalence ranges from 6.2 percent among women who had never married; up to 14.2 percent among those currently married

or in union up to 26 percent among those divorced or widowed among females aged 15–24 (www.unicef.org/.../7310/).

Out of fear of being suspected of promiscuity, violence, separation or divorce, wives resign to unsafe sexual intercourse even when fully aware of their husbands' unfaithfulness. For instance, in Uganda, it is still widely believed that women have no right to deny their husbands sex (Gage & Ali, 2005). Married couples may have 'blind' trust in each other thus not bother to discuss safer sex issues. In addition, fertility and motherhood issues often prevent girls and women from using condoms (UNFPA, 2011).

Surveys suggest a high incidence of extramarital sexual activity and STIs among some married men (Ntozi, Najjumba, Ahimbisibwe, Ayiga & Odwee, 2003) resulting to high HIV infection among married couples. In Kenya, more than 44.1 percent of all new infections occur in stable or long-term relationships including marriages. Married couples are three times more likely to become infected than sex workers who account for only 14.05 per cent of new infection (The Kenya AIDS epidemic UPDATE 2012). This is not unique to Kenya as demonstrated in a study conducted on five African countries which showed that two thirds of married couples were serodiscordant. For instance, in Zambia, over half of the infections occurred within marriage and cohabiting relationships and slightly below half in Uganda (Stephenson, 2008; UNAIDS/World Bank, 2008).

An earlier study in Kenya revealed conflicting findings that divorced and separated individuals had significantly higher HIV prevalence (14.8%) compared with married and cohabiting individuals (4.0%) (Mnyika, Klepp, Kvale, Nilssen, Ole-King'ori, 1994). Kumarasamy, Ganesh and Amalrai (1998) in a study in India

found higher prevalence of HIV infection among divorced and/or single individuals both in urban (21.1%) and rural (26.1%) compared to HIV infection among housewives which stood at 4.1 percent in urban and 3.8 percent in rural area. Similarly, in a study conducted in South Africa among 15 and older population found HIV prevalence to be higher among the unmarried (15.7%) than the married (10.5%) with a p-value of (< 0.001).

The presumption that marriage is protective is misleading and potentially dangerous for girls and young women. Thus, marriage can be a major risk factor for women who are powerless to negotiate condom use or their husbands' extramarital behaviour. Studies indicate that in some regions, a high proportion of HIV-positive married women are most likely infected by their husbands, their only sexual partner (UNAIDS, 2001). For instance, an estimated 60-80 percent of HIV-positive African women had had sexual intercourse solely with their husband. In a sample survey in India, 91 percent of married HIV positive women reported only ever having had sex with their husbands.

2.6.4 Religion and response to HIV prevention strategies

Students' adherence to religion is an important factor because their behaviour including sexual practices such as adoption of a prevention strategy is likely to be influenced by their religious beliefs and convictions. Messina (1994) argues that religion has strength and provides guidance to human behaviour. McCain (2003) also contends that passion and religion influence each other.

According to Pew Forum on Religion and Public Life (2012), 84 percent of the world population identify with a faith community. However, religious commitment tends to decrease among young adults as they enter college life. The

Pew Forum, Diocese of Peterson (2012) recorded a low of 25.4 percent of regular church attendance among college students. This puts religion in a privileged position to influence people's behaviour in the fight against HIV and AIDS.

Although religious communities have contributed greatly to treatment and care of people living with HIV and AIDS, it is less clear whether religion is an aid or a barrier when it comes to HIV prevention efforts (IRIN, 2008). Genrich and Brathwaite (2005) in a qualitative study involving religious groups in Trinidad found that opinions on condom use differed, ranging from an acceptance of condoms in lieu of the "reality" of HIV and AIDS, to a general contempt for their use as a substitute for self-control. A WHO (2007) report indicated that faith-based organisations were providing between 30 and 70 per cent of all health-care infrastructures across the African continent. In particular, in Zambia and Lesotho, 33 to 40 per cent of all HIV-related care and treatment services were operated by faith-based groups.

Despite its support in health issues, most religious groups consider HIV and AIDS as a punishment from God to the wrong-doers (Nzioka, 1996). Some religious communities, especially the Roman Catholics, are opposed to the use of condoms among their faithful heterosexual couples arguing that it is an artificial form of contraception that does not rely on the functions of the body (National AIDS Control Council, 2000). The Church believes condoms serve to implicitly and inexcusably encourage premarital and extramarital sex. Additionally, the Church advocates abstinence as the only morally viable course of action among the unmarried. However, there is still some discussion in the Church, particularly

in Africa, about whether condoms could be justified in cases where one of the partners has the virus.

Among the Protestants condom use has elicited mixed reactions. Razafimahefa, the former head of the Madagascar's Protestant Church, firmly opposed the use of the condom arguing that it promotes promiscuity (http://en.wikipedia.org/wiki/Religion_an). However, other Protestant denominations allow use of condoms within the context of marriage and even encourage people to test for HIV. Arguably, an infected partner of a married couple has an obligation to use protective measure to safeguard the health of the other partner. Besides Christians, it is also reported that in Thailand, some Buddhist monks offer blessed condoms for couples (<http://www.pbs.org/wgbh/rxforsurvival/series/champions/mechai-iravaidya.htm>).

Trinitapoli and Regnerus (2006) in a study of married men in Sub-Saharan Africa found substantial variation according to religious affiliation and religious involvement. Unlike men belonging to other denominations, men attending Pentecostal churches reported lower levels of HIV risk behaviour and perceived risk. Independent of denomination, attendance at religious services was associated with reduced odds of risk behaviour and perceived risk of infection. Famuyiwa and Torimoro (n.d) found that among the 15 to 24 year olds in Osun State of Nigeria, religion was significantly associated to perceptions of HIV and AIDS prevention strategies with a contingency value of 0.87 and a high chi-square value ($\chi^2 = 262.77$) that signified a strong strength of association at $P < 0.05$. Mulugeta and Berhene (2014) study yielded similar findings in Bahir Dar, Ethiopia among single high school students. Students who attended religious services two or more

times a week were five times less likely to initiate early sex than those attained the service less than two times a week [AOR = 0.50, 95% CI: (0.28, 0.89)].

Research also suggests that due to restrictions on the consumption of alcoholic drinks and sexual behaviour, Muslims tend to have lower levels of HIV prevalence compared to non- Muslims. Gray, (2004) in a meta-analysis of 38 sub-Saharan countries found a negative relationship between HIV prevalence and being Muslim in six of seven published journal articles. It is clear that religious beliefs and groups have contributed to negative attitudes towards condom use.

2.6.5 Area of residence during holidays

Usually, urban areas have more HIV prevalence than rural areas. Maas, Fairbairn, Kerr, Montaner and Wood (2007) examined HIV incidence among a cohort of IDUs in Vancouver and found area of residence as an independent predictor of HIV seroconversion (relative hazard = 2.0, 95%CI: 1.4 – 3.0, $p < 0.001$). Hall, Espinoza, Benbow and Hu (2010) opine that the U.S. HIV epidemic is primarily concentrated in urban areas. Using data from national HIV surveillance for 12 metropolitan statistical areas (MSAs) to determine disparities in HIV diagnoses and prevalence and changes over time, Hall, et al described the epidemiology of HIV in large urban areas with the highest HIV burden. **They found that** overall, 0.3 percent to 1 percent of the MSA populations were living with HIV at the end of 2007. In each MSA, prevalence was >1 percent among blacks; >2 percent in Miami, New York, and Baltimore. Among Hispanics, prevalence was >1 percent in New York and Philadelphia.

Long et al (2006) studied the link between HIV infection among heroin users and area of residence on a sample of clients attending treatment between 1997

and 2000 in two areas of Dublin; an inner city area (Dublin 8) and a suburban area (Dublin 24). Results showed that a higher proportion of heroin users in Dublin 8 had HIV than did their counterparts in Dublin 24. The analysis suggested that the risk of acquiring HIV was associated with area of residence. A study conducted in Arusha, Tanzania by Mnyika, et al (1994) presented similar results. Mnyika et al. estimated prevalence of HIV infection among adult population at 10.7 percent; in urban (5.2%), semi-urban (2.2%) and rural areas (1.6%) in that decreasing order of magnitude.

In the urban and rural areas of Tamil Nadu, India, Solomon, Kumarasamy, Ganesh and Amalrai (1998) found prevalence of both HIV-1 and HIV-2 to be higher in urban than in rural areas among all the sub-groups studied including: male and female; married and single/divorced women. About 75 percent of Kenyans live in rural areas and there are more people living with HIV and AIDS in these regions (KAIS, 2007). As literature suggests, an individual's area of residence is significant in determining risk of HIV infection.

2.7 Knowledge levels about HIV and AIDS and adoption of prevention strategies

It is generally assumed that greater knowledge and awareness of HIV and AIDS transmission routes and preventive strategies positively influences people's sexual behaviours. However, the association between knowledge and sexual behaviour has remained rather ambiguous. People are aware of modes of HIV and AIDS transmission, yet they continue to indulge in risky sexual behaviours (Piot, 2002; UNAIDS, 2003). Literature has proved that there exists a gap between knowledge (theory) and behaviour (practice). Even people with adequate

information who profess HIV and AIDS prevention attitudes, in practice do not always follow the very principles they subscribe to when it comes to HIV prevention (Bastard & Cardia-Vonche, 1997 in: Kapakova, 2003).

Empirical evidence suggests that most young adults are aware of the available prevention strategies yet the uptake is low. That is, they are aware that condoms prevent HIV infection and that it is important to use a condom every time they have sex, but they still engage in unprotected sex (Anyagu, 2008). UNAIDS (2000) note that general information on HIV and AIDS is not important in changing people's sexual behaviours. Instead, people need accurate knowledge and appropriate psychosocial skills to influence behaviour.

Today's young people have grown up in a world changed by AIDS yet they still lack comprehensive and correct knowledge on how to prevent HIV infection (UNFPA, 2010). Population based surveys conducted by international organisations on low and middle income African countries show that too many 15-24 year olds do not know how to prevent HIV infection and they hold misconceptions about how the virus is spread. For instance, UNAIDS (2008) survey indicate that by 2007 only 40 percent of young men and 38 percent of young women had accurate and comprehensive knowledge of HIV. These percentages decreased in 2010 for only 36 percent of young men and 24 percent of young women responded correctly when asked five questions on HIV prevention and HIV transmission (UNAIDS, 2011). These comprehensive knowledge levels are far below the 90 percent target set by governments for achievement by 2005.

Empirical studies on students in tertiary institutions present very high knowledge levels on HIV prevention and transmission routes (UNAIDS, 2007; Sarker et al, 2005; Milkowski & Slanger, 2005 and Xiaoming et al, 2004). In assessing knowledge scores and perceptions of risk HIV and AIDS among African-American students, Madeline et al., (2011) found 82 percent of students to possess average to high HIV knowledge scores. Similarly, while exploring relationships between knowledge about HIV and AIDS and prevention strategies, Ojikutu, Adeleke, Tajdeen, and Ajjjola (2010) reported that 97 percent of the students in tertiary institutions in Nigeria knew about the disease. Of these, 38.2 percent practiced abstinence, 24.1 percent used condom, 32.99 percent were faithful to a partner and 4.63 percent did not use any method. They concluded that knowledge about HIV and AIDS was not significantly associated with the method used in preventing the disease ($\chi^2 = 4.177, p>0.05$).

In another study on college students in the United States, Inungu, Mumford, Younis and Langford (2008) found that although majority of students (77.3%) reported to be familiar with HIV and AIDS including its mode of transmission, important misconceptions existed. Several students thought that mosquitoes transmit HIV and AIDS (14.2%) and about 43.1 percent were unsure about the existence of drugs that can prevent mother to child transmission of HIV. About 12 percent were unaware of existence of such drugs. These findings were collaborated by results in a study on students in University of Botswana where Lindsey et al. (2012) found that 96 percent of students had correct responses to questions related to HIV and AIDS knowledge. Despite the high knowledge,

perceived use of HIV and AIDS prevention strategies such as testing for HIV and condom use remained lower than might be predicted based on knowledge scores.

Such knowledge gaps have been reported in several studies (UNAIDS, 2007; Sarker et al, 2005; Milkowski & Slanger, 2005). Xiaoming et al (2004) found that while students in Chinese colleges could identify HIV and AIDS transmission modes, they were less knowledgeable about symptoms, activities that did not transmit the virus, treatment and preventive measures. Similarly, Ndola, Leo, Mazive, Vahidnia and Stehr (2006) in a national study on knowledge and risk perceptions among 15-24 year olds in Mozambique found that although only 8 percent of men and 3 percent of women gave incorrect answers on HIV transmission (e.g., by kissing or holding hands, or through witchcraft or mosquito bites), only 79 percent of men and 74 percent of women knew that a person could look healthy and be infected with HIV. These findings were consistent with previous survey reports that people may know some specific modes of transmission, but lack a general understanding of the disease. Most people still believe that HIV infection can be contracted through insect bites (including mosquitoes) saliva, toilet seats and sharing utensils with infected persons.

HIV and AIDS knowledge levels are usually higher for young men than for young women. Lal, Vasan, Sukara, and Thankappan (2000) conducted a cross-sectional community-based survey of 625 randomly selected undergraduate college students in Karel, India aged 18-22 years. Using multivariate linear regression to study the association of the scores with selected predictor variables (gender and place of residence), a substantial lacuna in knowledge and attitudes toward AIDS, STDs and STIs was identified. The gap in knowledge between boys

and girls, rural and urban students suggested a need for targeting girls and rural areas in national AIDS education and awareness campaigns.

Studies assessing where young adults in colleges and universities on source their HIV and AIDS information tend to indicate that the main source of information is the mass media; television/video, radio, magazines, and newspapers. Friends, parents and politicians are presented as least important sources of information. In a study conducted by Maureed and Tasanapradit (2009), 93.4 percent, 80.3 percent, 78.9 percent and 55 percent of university students ranked television, internet, newspaper and teachers as sources of information on HIV and AIDS in that order of importance. A large majority said they had heard very little information from their boy/girl friends. In another study, lecturers (61%), and radio (44%) were frequently reported as major sources of HIV and AIDS information while friends/ relatives (31%) and health care workers (39%) were less frequently reported (Nasir et al, 2008). However, majority of students in Chinese colleges reported having discussed AIDS issues with their peers and friends, but few of them had done so with their parents or teachers (Xiaoming et al., 2004). Generally, mass and electronic media have been ranked highly as sources of information in most studies including; Mwanguru (2008); Wong et al (2008); Asmare and Moges (2006); Saller (2009); Adetoro (2009); Ajayi and Omatayo (2010); and Idayat (2012). This is probably because most behaviour change campaigns use mass media as a means to reaching out to the population.

2.8 Sexual behaviours and adoption of HIV prevention strategies

The primary mode of HIV transmission in sub-Saharan Africa is heterosexual sex. This underlines the need to focus on sexual behaviour change as a major HIV prevention effort. Sexual behaviours constitute elements such as: number of sexual partners; type of relationship (regular/casual); sex debut; serial monogamy; and sexual practices such as unprotected penetrative vaginal/anal/oral sexual intercourse, protected penetrative vaginal/anal/oral sexual intercourse; swapping of sexual partners; sex with at 'risk' groups including bisexual men, men who have sex with men, commercial sex workers and homosexuals. There exists a relationship between sexual behaviour and HIV prevention strategies. For instance, individuals who engage in high risk sexual behaviours (sex with commercial sex workers) may decide to adopt a preventive strategy (use a condom). In this case, sexual behaviour influences adoption of a prevention strategy.

However, existing literature has shown mixed evidence of behavioural response in Africa. Caldwell (1999) summarised a number of cases in Africa and concluded that response to HIV prevention has been limited. Other researchers who report limited to no change include Oster (2005) who saw lack of change in women who reported engaging in pre-marital sex in a number of countries throughout Africa in 1990s. Stoneburner and Bear (2004) found limited link between sexual behaviours and HIV prevention strategies in Uganda.

Notwithstanding this, changes in sexual behaviours have been recorded among men in Tanzania, (Ng'weshami et al., 1996). Bloom et al., (2000) found mixed evidence in Zambia with reductions in number of sexual partners among

the study respondents over some periods and not over others. Most existing explanation for limited behaviour change focus on Africa specific cultural barriers to behaviour such as fatalism and low levels of women bargaining power (Amuyunzu et al, 1999).

The differences in behaviour change can also be explained by differences between dynamics of gender HIV transmission (O'Farrell, 2001) and between trends in sexual behaviour among men and women in the developing world. Slaymaker and Buckner (2004), suggest that sexual behaviour may differentially impact transmission risk among men and women. In one Zimbabwean cohort, for instance, the risk of HIV rose with increasing number of sexual partners among women, but not among men (Gregson et al. (2006). Kelly (1995) pointed out that in spite of the fact that behaviour change is the only sure means to prevent HIV infection this behaviour is very hard for people to change. Some of the sexual behaviours that influence adoption of prevention strategies among college students are discussed in the following sections.

2.8.1 Sexual debut and adoption of HIV prevention strategy

Although not all sex is risky, for example, protected sex and sex with one faithful uninfected partner, initiating sex is the entry point to subsequent sexual risk behaviour (Kermyt et al., 2007). Delayed sexual debut is one of the factors attributed to decline in HIV infection. Those who initiate sex early spend more years of their lives at risk of HIV infection than those who start sex late. It is hypothesised that youth who are sexually inexperienced and perceive themselves to be at risk of HIV infection are more likely to delay sexual debut than those who perceive themselves to be at lower risk (WHO, 2004).

Studies conducted among youth aged 15-24 years show that more than half of the youth in this group initiate sex before the age of 20. Grunseit and Richer (2000) reported that the average American male has their first sex at 16.9 years. Findings at California State University, Kinsley Institute, also confirm this – on average males lose virginity at 16.9 years while the females at a slightly older age of 17.4. According to CDC's 2009 National Youth Risk Behaviour Survey (YRBS), many adolescents initiate sex at early ages. About 46.0 percent of high school students had had sexual intercourse, and 5.9 percent had done so before the age of 13. Of the 34.2 percent of students reporting sexual intercourse during the 3 months before the survey, 38.9 percent had not used a condom.

Studies in sub-Saharan Africa show no difference in sex debut. By age 20, at least 80 percent of sub-Saharan African youth are sexually experienced. A national study conducted in Kenya indicated that 14 percent of women and 30 percent of men had initiated sex before the age of 15 years. The median age for women was 16.8 to 17.8 while that of men was 16.8 to 17.1 years (NACC, 2008). In Nigeria, sex debut was seen to be even much lower with youth initiating sex at pre-teen years. Torimiro, Adisa, Okorie, and Famuyiwa (2007) reported mean ages of sexual debut of male and female respondents as 13.4 and 12.8 years with a standard deviation of 2.4 and 2.1 respectively. They also found that among Nigerian young adults, only 22 percent of males and 7 percent of females reported that they had abstained from sex. Kalawole (2010) on a study of Nigerian and South African undergraduate students also found that more boys (67.81%) than girls (45.60%) initiated sex by their first year in the university.

Empirical studies associate early age of sexual onset with increased number of lifetime sexual partners, lowered intentions to use condoms in subsequent relationships and increased likelihood of getting infected with the AIDS virus. Baumgartner, Waszak, Tucker and Wedderburn (2009) in a controlled study among pregnant youth in Jamaica found an interaction between early sexual debut and multiple partners. In Ethiopia, about 16 percent of young single women reported early sexual debut (Wouhabe, 2007) out of which 24.6 percent had two or more sexual partners but only 10 percent had used condom during sexual intercourse. Michelle and Adesegun (2009) assert that female youth who initiate pre-marital sex early appear more likely to have sex with high risk partners or multiple partners and are less likely to use condom and other contraceptives. Therefore, they are vulnerable to sexually transmitted infections including HIV and AIDS (Uchenna, 2008).

Early sexual debut implies that most young people are already at risk of contracting the AIDS virus by the time they enter college. Gaps in theory and practice still exist to enhance sexual behaviour that help in prevention of HIV infection.

2.8.2 Number of sexual partners and HIV prevention strategies

Having more than one regular partner at the same time is often more dangerous than moving from one regular partner to the next (serial monogamy). This is because people tend to be more cautious in new relationships and are more likely to use protection than in regular relationships; especially where issues of trust are viewed as more important. Literature point out that females usually have fewer sexual partners as compared to males and that women play subordinate roles in

sexual matters, placing them at risk of infection from their male counterparts (KDHS, 2003; Kapakova 2003).

In Botswana it was found that one of the drivers of the HIV epidemic was the high rate of multiple concurrent partnerships (MCP). Multiple concurrent partnerships fuel the spread of HIV because of two related issues: First, because the partners are to a certain extent usually 'regular' ones, use of condoms is not as consistent or is non-existent. This means that if one partner were to become infected, there is a very high chance that all the partners would become infected. Second, a lot of multiple concurrent partnerships link with other partnerships, creating a network that has proven to be very dangerous when it comes to the spread of HIV and other STIs. One of the most important myths that is held about multiple concurrent partnerships is that they consist of one person with many partners, whereas the opposite is true; in most multiple concurrent partnerships one person has two to three regular partners. In addition, some may have other casual partners from time to time, including many 'one-night' stands.

Studies with African-American college students have shown that, like college students from other racial and ethnic groups, behaviours that can increase the risk of HIV acquisition and transmission such as; multiple, concurrent sex partners and inconsistent condom use do occur despite previous exposure to general HIV educational messages. This means that the HIV and AIDS Knowledge, Attitude, Behaviour (KAB) and perceptions of sex partner risk have not been well-characterized among African-American students.

Exavery et al (2011) in a study in four districts in Tanzania with young adolescents found no evidence of association between multiple sexual partners

and condom use (OR = 0.77, 95% CI = 0.35 - 1.67, P = 0.504). A large proportion of adolescents, even with multiple partners, engaged in sexual activity without using condoms. In an earlier study in the same country, it was observed that 35 percent of secondary school and college students aged 16 - 24 years who had multiple sexual partners did not always use condoms. The students who engaged in risky sexual behaviours were aware of the risk, yet they failed to adopt preventive measures (Maswanya et al., 1999). In a study on hard to reach young women in peri-urban South Africa, Yanga, Townsend, Thorson, and Ekström (2012) found that on average, women had had 7 partners in 3 months prior to the study. Having more than 5 sexual partners doubled the risk of unprotected sex (OR 2.43, CI 1.39–4.25). In Cameroon, Tarkang (2013) explored on condom use and multiple partnership among female students in secondary schools and found condom use to be significantly negatively associated with multiple and concurrent partnerships. A pattern of decrease in condom use with increase in number of multiple partners was detected.

However, in Angola, youths aged 15 - 24 years with multiple sexual partners used condoms consistently (Prata, Vahidnia, & Fraser, 2005) and in Kenya, Ferguson, Pele, Morris, Ngugi and Moses (2004) found that men who had multiple sexual partners used condoms exclusively with them.

2.8.3 Type of sexual partner and HIV and AIDS prevention strategies

Prevalence of male condom use tends to vary considerably by partner type: highest with sex workers, lower with casual partners, and lowest with regular or marital partners (Douthwaite & Saroun, 2006; Ferguson et al., 2004; Macaluso et al., 2000; & Norman, 2003). Waithaka and Bessinger (2001) found that less than

one-half of non-married men used a condom with non-regular partners at last sex, and just over one-half used a condom if it was sex for payment.

However, Yanga et al. (2012) in their study, recorded that 73% (CI 67.6–78.4) of the young women had easy access to condoms, yet majority reported inconsistent condom use both with their most recent main partner (77%, CI 72.4–82.7) and casual sexual partners (56%, CI 49.6–62.1) in the past three months prior to the study. Among those who reported having sex with ‘once off partners’ (82%, CI 64.3–95.9) males and (30%, CI 17.1–31.3) females did not use a condom. One fifth (22.8%) of these students had their sexual debut after they joined university. Another study by Tariku, Lemessa, & Nega (2012) among undergraduate students in Haramaya University in Ethiopia found that about 6 percent of students with sexual experience reported having had intercourse with same-sex partners while about half of the males with sexual experience had intercourse with a commercial sex worker.

2.9 Risk perceptions to HIV and AIDS and adopted prevention strategies

Risk perception is a subjective judgement that people make about the characteristics and severity of a risk. Risk is perceived in our psychological, social and cultural context. Individual and social characteristics form our risk perception and influence the way we react towards risks (Schmidt, 2004). To measure perception of HIV risk, studies have used a number of variables including; number of sexual partners, knowledge of sexual partners’ past sexual behaviour, fear of AIDS, shame associated with AIDS, community perceptions of AIDS risk, knowing someone with AIDS, discussing AIDS at home, closeness of parent-

child relationship and religious affiliation among others. However, analysis of such variables has not been conclusive (Macintyre et al., 2004).

Available literature reveals that the relationship between perceptions of risk and prevention strategies is complex and poorly understood (Ndola, et al. 2006). Although most cognitive theories acknowledge risk perception as central to behaviour change, it is unclear how individuals' risk assessments relate to their sexual behaviour (Becker & Joseph, 1998). On the same breadth, health behaviour models posit that the perceived level of risk to HIV infection is associated with the level of HIV risk behaviour but there is limited literature to firmly conclude this (Kermyt, Beutel & Maughan-Brown, 2007; Ndola et al., 2006).

Generally, people are more likely to underestimate than overestimate individual risks to HIV infection regardless of their sexual behaviours (Nzioka, 2001). Ndola et al (2006) found a tendency for Mozambique 15-24 year olds to underestimate their risk of contracting HIV. In addition, people who consider themselves to be at risk of HIV infection usually think that their regular partners and not themselves would be the source of infection (Anugwom, 1999; Idele, 2002; KDHS, 1993). In Grant and Deetiou (1998) the youth in the study acknowledged that the general public was at risk of HIV infection, and that young adults might be even at a higher risk, but the concept of personal risk was not well articulated.

Adedeji et al. (2009) in a study involving college students observed that perception of HIV risk was generally poor with 54 percent of those aged 30 years and older, 48.1 percent of 20-29 year olds, and 57.9 percent of those below the age of 20 years perceiving themselves as not having any chance of being infected

with HIV. Adedeji et al. (2011) in another study that examined HIV-related sexual risk behaviours and perception of risk among university students in US, Turkey and South Africa found a low perception of HIV risk among US and Turkish students. More South African male and female students perceived themselves to be at risk for HIV infection than their US and Turkish counterparts. A high proportion of South African female students had a high HIV risk profile, but there was no agreement between their behaviour and their perception of HIV risk.

Ward, Disch, Levy and Jchensul (2004) posit that despite the rising numbers of HIV and AIDS cases among college students, their perception to risk of HIV infection was low. Sutton et al. (2011) found that of the students who were surveyed, 79 percent perceived themselves to be at low risk for HIV infection. Adedeji et al. (2009) also reported poor perception of HIV risk. Slightly over a half of the students (57.9%) of those below the age of 20 years perceived themselves as not having any chance of being infected with HIV. Inungu et al (2008) posited that in spite of the high prevalence of risky sexual behaviours among college students in United States, majority (86.8%) did not perceive themselves to be at risk for contracting HIV. Madeline et al., (2011) found that students who perceived themselves to be at low risk for HIV infection; and who had two or more sex partners had not used a condom at last sex encounter. Using 1998 Kenyan demographic health survey data, Akwara, Madise and Hinde (2003) reported that the odds of having risky sexual behaviour were more than tripled among men and women who perceived their risk of HIV and AIDS as high.

When people make correct assessments about their risk to HIV infection, they are in a position to take appropriate HIV prevention strategies. Ndola et al. (2006) found that correct assessment was positively associated with condom use. The never-married males in the study who assessed their risk correctly were 18 percent more likely than other males to report condom use; and the never-married females were 17 percent more likely than other females. Personal risk perception was also associated with increased condom use among youth in Cameroon (Meekers & Klein, (2002) and in Ghana (Adih, & Alexander, 1999). Another study among South African couples found that women who considered themselves at risk of HIV because of their husbands' promiscuity were four times as likely to use condoms as women who did not (Maharaj & Cleland, 2005). In Kaula Lumpur, Malaysia, men-who-have-sex-with-men who rated themselves to be at high risk of HIV infection were 17 times more likely to be infected than those who perceived themselves to be at low risk (Kwee & Yong, 2014).

Generally, the way people assess themselves in regard to risks of HIV infection determines whether they will adopt or not adopt a preventive strategy against the infection.

2.10 Theoretical framework

A number of theories and models have been advanced to explain individual-level and multi-level factors that influence HIV and AIDS prevention. HIV and AIDS has been identified as a behavioural disease that could be eradicated if people changed their sexual behaviours. Individual-level theories and models that have been advanced to explain determinants of HIV and AIDS prevention and that are relevant to the current study include: Social Cognitive Theory (SCT) by

Bandura (1986); Theory of Reasoned Action (SRT) by Fishbein, (1994); Health Belief Model (HBM) by Rosenstolk et al., (1974) and AIDS Risk Reduction Model (ARRM) by Catania, Kegeles and Coates (1990). These theories make complimentary contribution to the development of HIV and AIDS transmission and prevention research. The SCT, TRA ARRM and HBM focus on cognitive variables as part of behaviour change and share the assumptions that attitudes and beliefs as well as expectations of future outcomes are major determinants of health related behaviour. The theories propose that faced with alternatives, individuals will choose the action that will lead most likely to positive outcomes (Munro, Lewin, Swart & Volmink, 2007).

Critics of the theories contend that the theories assume that people have the motivation and freedom to adopt protective actions. These theories generally do not address the fact that HIV transmission is a social event and many factors affect whether or not an individual is going to have sexual intercourse and whether or not sexual intercourse will potentially involve transmission risk (DiClemente, 2008; Evans & Lambert, 2008). However, the theories have been used extensively in the context of HIV and AIDS transmission and prevention and have garnered considerable support. The following is a discussion of the theories and models that propose such mediators and on which the current study is based.

(a) Health Belief Model

The Health Belief Model posits that behaviour change is based on a rational assessment of the balance between the barriers to and benefits of action. Health related behaviour depend on four key beliefs that a person must hold in order to be able to change behaviour. Such include: the perceived seriousness of and

susceptibility to a disease (“AIDS is a serious disease; I am at risk of contracting the AIDS causing virus”) which influence individual’s perceived threat of disease. Similarly, perceived benefits of preventive action (“If I abstain from sex/ start using condoms/ remain faithful/, I can avoid HIV infection”) influence perceptions of the effectiveness of health behaviour (“fidelity/abstinence/condoms/ are effective protective measures against HIV infection”). In turn socio-demographics (age, gender, marital status and awareness); psycho-social (HIV-related intentions such as ‘intention to adopt a prevention strategy’) and structural (policies) variables that act as enabling factors influence both perceived susceptibility and perceived seriousness, and the perceived benefits and perceived barriers to action.

In addition, perceived threat is influenced by cues to action (“witnessing death or illness of a close friend or relative due to AIDS”). Generally, high perceived threat, low barriers and high perceived benefits to action increases the likelihood of adopting HIV and AIDS prevention strategies. Figure 2.1 shows the interrelatedness of the key beliefs in the Health Belief Model.

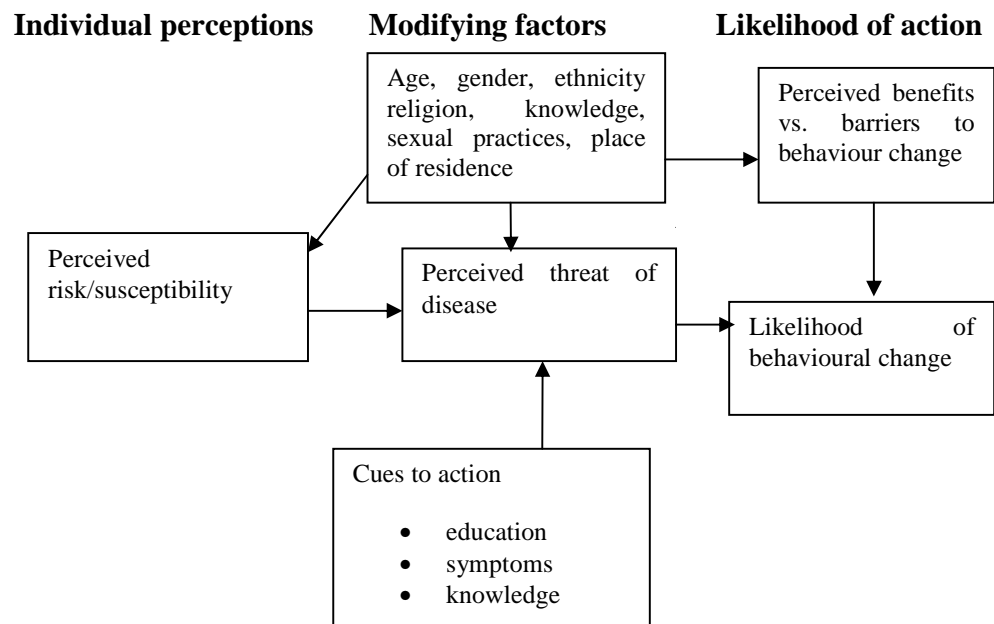


Figure 2.1 Interrelatedness of key beliefs in Health Belief Model

Source: Adapted from Glanz, Rimer, and Lewis, (2002)

Gust (1993) examined the predictive utility of the HBM in relation to prevention of HIV infection among Asian-American college students. Results indicated that severity and barriers were significant predictors of the adoption of HIV-preventive behaviours. Severity was a significant predictor of becoming more careful about the selection of intimate partners, reducing the number of sexual partners, and positive changes toward safer sexual behaviour, whereas barrier was a significant predictor of becoming more careful about the selection of intimate partners, reducing the number of sexual partners, and ensuring that sexual partners were not HIV infected.

However, Kirscht and Joseph: in Drasin (2000) in reviewing a coping and change study earlier conducted in Chicago stated that the HBM presents a mixed picture as an explanatory framework for health related behaviour. They opined that rarely has there been a confirmation of the full model in which the set of

elements together give a coherent picture in behaviour change. Maarugu (1994) also asserted that HBM has limited application when it comes to assessing sexual behaviour because adoption of a preventive strategy is not a one-time or occasional convenience. These findings were consistent with those of Munro et al (2007) meta-analysis results on HBM which showed that though the model is to some extent capable of predicting variance in behaviour it is nevertheless not conclusive in itself. All in all, it has been established that the HBM has useful features but which require synthesis with other frameworks for change.

(b) Theory of Reasoned Action

The Theory of Reasoned Action is conceptually similar to the HBM but adds the construct of behavioural intention as a determinant of health behaviour (Kiragu & Pulerwitz (1999). Fishben and Ajzen (1975) argue that human beings are rational and make systematic use of information in deciding whether to engage or not to engage in a given behaviour. The TRA assumes that most socially relevant behaviours are under volitional control and that a person's intention to perform a particular behaviour is both the immediate determinant and the single best predictor of that behaviour. Intention to perform a behaviour is influenced by attitudes towards the action; the individual's positive and negative evaluations of the outcome of the behaviour (Munro et al, 2007). A person's intention is also a function of subjective norms, including the perceived expectations of significant others. Behaviour intention then results into action.

In applying the theory to the context of HIV and AIDS prevention, it would mean that for a student to start practicing fidelity (intended behaviour), he or she might hold the attitude that sexual gratification with other partners other than the

regular one only results to “guilt feelings” (attitude towards the behaviour). The subjective norm could be (most of my peers are faithful to their partners and they would expect me to be as well). Therefore, an individual’s actions is a result of intentions, attitudes and perceived benefits.

Critics of the theory contend that although the theory enhances the ability of sociologists to analyze ways in which social structures hinder and at the same time facilitate the social action of an individual, it fails to account for attitudes and intentions influenced by other factors (Munro et al, 2007; Hedstorm & Swedberge, 1996). Kapakova (2003) argues that in situations full of emotions and sexual desires the TRA cannot systematically analyse behaviour.

(c) Social Cognitive Theory

Bandura (1986) championed the Social Cognitive Theory (SCT) as a way of understanding behaviour. SCT is a personal-level theory that specifies a core set of determinants, the mechanism through which they work, and ways of translating this knowledge into effective health practices. The core determinants include knowledge of health risks, benefits of different health practices and perceived self-efficacy. In addition it outlines the outcome expectations about the expected costs and benefits for different health habits, the health goals people set for themselves, the concrete plans and strategies for realizing them, and the perceived facilitators and social and structural impediments to the changes people seek.

The theory asserts that information alone is not sufficient to change behaviour. Behaviour change is dynamic and it is influenced by both individual and environmental factors, that is, people learn new behaviour through direct experience or modelling. Bandura argues that sustained behaviour change requires

the skills to engage in the behaviour and the ability to use these skills consistently and under difficult circumstances. He asserts that human beings are not just driven by inner forces; and neither are they helpless pawns of environmental influence. The interaction of the concepts is demonstrated in Figure 2.2.

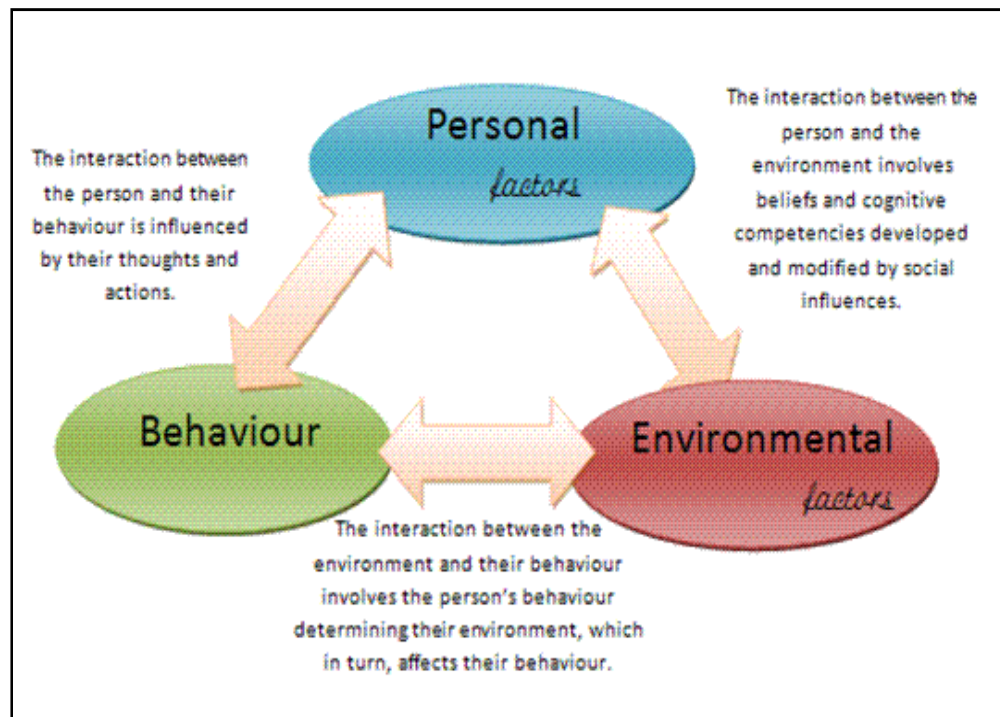


Figure 2.2: Interaction of the SCT concepts

Source: Communication Theory Blog (2013)

The CTS finds significance in the context of the current study in that it stresses the cognitive process (making a choice to adopt HIV prevention strategies) that is involved in acquiring and maintaining patterns of behaviour. The basic organizing principle of behaviour change as proposed by SCT is reciprocal determinism that points to a complex dynamic interaction of individual factors (age, gender, religion); environmental stimuli (knowledge) and behaviour (sexual behaviours) with each capable of influencing each other. The SCT has been used to study a

wide range of health problems; medical therapy compliance; HIV prevention; immunizations. However, critics of the theory posit that the theory's comprehensiveness and complexity make it difficult for researchers and academicians to operationalise. Many applications of the SCT focus on one or two constructs, such as self-efficacy, while ignoring the others.

(d) AIDS Risk Reduction Model

The ARRM was developed by Catania et al., (1990) within the context of HIV and AIDS. It includes elements of Health Belief Model (Rosenstock et al, 1974), Social Cognitive Theory (Bandura, 1986) and Diffusion of Innovation Model (Rogers, 1995). ARRM is one of the stages of change model that posits that behaviour change is a process in which individuals move from one step to the next as a result of presence of certain stimulus.

The model characterises people's efforts to change sexual behaviours related to HIV transmission in three steps. It focuses on social and psychological factors hypothesised to influence (1) recognition and labelling of high risk behaviours as high risk (knowledge of HIV transmission modes and believing that one is susceptible to HIV infection); (2) making a commitment to change high risk behaviours (enjoyment – remaining with one sexual partner will not affect my enjoyment of sex); and (3) seeking and enacting solutions directed at reducing high risk activities (adopting HIV and AIDS prevention strategies such as abstinence, fidelity, consistent correct condom use). In addition to the stages and influences, Catania et al. (1990) identified other internal and external factors that may influence a person's movement across the stages. For instance, external

motivators such as seeing a person dying from AIDS may cause people to examine their sexual behaviours and adopt HIV prevention strategies.

The model provides a basis for understanding the motivators and inhibitors of adopting HIV prevention strategies. It holds that AIDS-risk reduction is a function of people's information about AIDS transmission and prevention, their motivation to reduce AIDS risk, and their behavioural skills for performing the specific acts involved in risk reduction (Fisher, J. D. & Fisher, W. A., 1992).

Applied to the current study, students' knowledge about HIV and AIDS related transmission and prevention strategies can influence their intention to adopt HIV and AIDS prevention strategies, consequently making decisions to adopt the strategies or not adopt. The ARRM has received empirical support from Catana, Coates and Kegeles (1994) who found that consistent with the model predictions, labelling one's behaviour as risky was associated with greater commitment to use condom with secondary partners; and labelling one's behaviour as risky was related to one's STD history. Further support was demonstrated in Kline and Vanlanclingham (1994) study on women living with HIV and AIDS.

The ARRM is criticised in that it focuses on the individual and fails to explain the role of context in the three stages. Although the theory addresses the social norms, it does not attend to the wider socio-cultural context in which norms, attitudes and perceptions to risk of contracting HIV infection are shaped (McGrath et al., 1993). In Uganda women felt at risk for HIV not because of their own behaviour but because of the behaviours of their partners; an issue the women reported was outside of their control (McGrath et al.). Researchers

recommend that the ARRM should consider socio-cultural issues that may influence or limit an individual’s behaviour choice and ability to take action.

2.11 Conceptual framework

A conceptual framework is a concise description accompanied by a graphic or a visual depiction of the major concepts of the study and the hypothesised relationships and linkages (Mugenda A. & Mugenda O., 2003). In considering the relationships between the independent and dependent variables in this study, the linkages are depicted in terms of a results chain. Figure 2.3 demonstrates this.

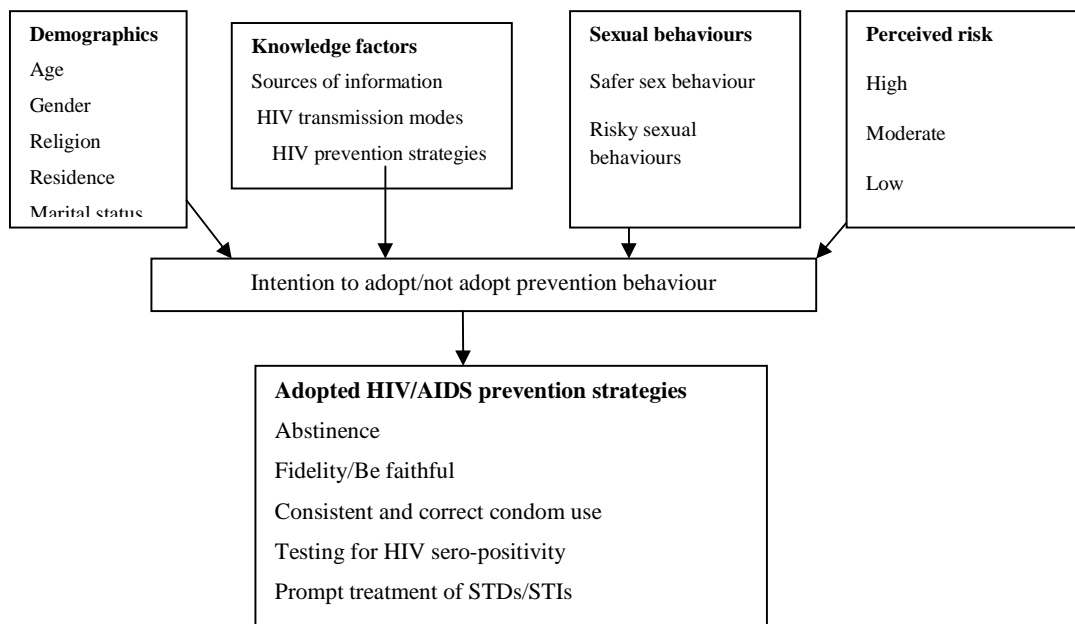


Figure 2.3: Diagrammatic representation of interrelatedness of the study variables

In analysing the interrelatedness among the study variables it is important to understand the conceptual relationship among independent and independent variables. In the study, the determinants of adoption of HIV and AIDS prevention namely; socio-demographics, knowledge, sexual behaviours and perceptions to HIV risk factors (independent variables) form the inputs. They are significant in

that acting on and operating through students' to perform a behaviour such as adopt a prevention strategy against the infection (process) they influence students' decisions to either adopt or not adopt HIV and AIDS prevention strategies (dependent variable) that constitutes the study output. The intention to adopt a preventive behaviour constitutes the cognitive and behavioural context within which an individual responds to HIV and AIDS pandemic. Intention to perform behaviour is an immediate determinant of behaviour performance.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the methodology that was utilized to investigate determinants that influence students in PTTCs to adopt HIV and AIDS prevention strategies. It describes the target population, sample size and sample selection techniques. In addition, the instruments that were used to collect data, their validity and reliability measures are described. Lastly, an explanation on data collection procedures, data analysis techniques and ethical considerations are discussed.

3.2 Study design

A cross-sectional descriptive correlational survey designs were utilised in the study. A cross-sectional design involves a one-time interaction with groups of people in order to collect the necessary information. Best and Kahn (2005) posit that descriptive survey is concerned with the conditions that exist, opinions that are held, processes that are going on, effects that are evident and trends that are developed. The design is primarily concerned with the present although it often considers past events and effects as they relate to the current conditions. In descriptive survey, the researcher is able to relate study variables to a conceptual framework so that the study builds on previous work (Pearson Education Inc., 1998), and an attempt is made to determine incidence, distribution and interrelations among vital facts of people's characteristics, thoughts, beliefs, opinions, attitudes, feelings, perceptions, behaviours and lifestyles (Kerlinger, 2007; Pearson Education Inc., 1998). In a survey, a sample population that is

considered representative of the entire population is studied by collecting and analyzing data and findings are generalized to the entire population. In addition, survey designs allow pilot study to be undertaken to pre-test data collection instruments (Cohen, Manion & Morrison, 2007). Correlational designs examine the relationships between two or more variables and provide the opportunity to determine the strength of the existing relationship or association between variables but not causal relationship. This design is used when there is supportive evidence that relationship exists between variables (Brink & Wood, 1998).

The current study fitted within the chosen designs because data were collected once across all the study participants using survey methods such as semi-structured face-to-face interviews, focus group discussions and self-administered questionnaires. This was in order to describe, show relationships and determine strength of associations between the study variables including; social-demographic factors, knowledge factors, sexual behaviours and risk perceptions that influence adoption of HIV and AIDS preventive strategies among students in PTTCs. Pre-test of instruments was done before the main study to increase accuracy of the instrument in capturing data.

In descriptive designs, studies take place in natural environments and phenomena are not manipulated. For this study, teacher training colleges were the natural environment for teacher trainees and the study variables were not subjected to any treatment (Orodho, 2003).

3.3 Target population

The target population for the study comprised of all the 9,000 second year students in the 20 PTTCs spread in eight administrative regions in Kenya; Central

(4), Coast (1), Eastern (5), North Eastern (1), Nyanza (3), North Rift (3), South Rift (1) and Western (2). (There was no PTTC in Nairobi region). The 20 college principals and 20 deans of students were also targeted for the study (Republic of Kenya, 2009). Students in the PTTCs are mainly in the age range of 18 to 30 years (Ojuado, 2003); thus falling within the age range at the greatest risk of HIV infection (KDHS, 2008/9).

Second year students were targeted for the study because being in their second term in second year of study they were just about to complete their two year teacher training course. As compared to first year students, who had had a short stint with college life, they were deemed to possess more experiences on college life and extensive knowledge on HIV and AIDS prevention education. The two administrators targeted in the study are charged with the responsibility of keeping records on the general conduct of the students and were thus deemed to possess vital information pertinent to the study.

3.4 Sample size and sampling procedures

Using the Sample Size Calculator formula (Creative Research Systems, 2003), a sample size of 1039 students was arrived at. The sample size fell within the recommended range of between 10 to 20 percent (Gay, 1987) and 10 to 30 percent (Mugenda, O. and Mugenda, A., 2003) sample sizes recommended for large populations. The figure was rounded to the nearest ten (1040). The following formula was used to calculate the desired student sample size.

Sample size formula:

$$ss = \frac{Z^2 * (p) * (1-p)}{c^2}$$

Where:

Z=Z value (1.96 for 95% confidence level)

p=percentage picking a choice, expressed as decimal
(.5 used for sample size needed)

c = confidence interval, expressed as decimal
(i.e., .0286 = ±2.86)

Correction for finite population formula:

$$ss = \frac{\text{New ss}}{1 + \frac{ss-1}{\text{Pop}}}$$

Where:

Pop = population

To obtain the 1,040 second year students, multi-stage cluster sampling techniques were employed. The recommended class size is 40 students per class and 2 classes were targeted per college. The sampling techniques employed per stage are discussed in the subsequent sub-sections.

(a) Selection of colleges

In stage one probability proportionate to size technique was employed to select 13 PTTCs ($1040/80 = 13$) out of the 20 PTTCs from 8 administrative regions. The stratification variable was administrative region. This ensured representativeness with reference to national education sub-regions, ethnic communities and the various religious affiliations. Table 3.1 presents the number of PTTCs sampled from each region.

Table 3.1
Sample distribution according to regions

Region	No. of PTTCs	Sampling fraction	Sample size
Central	4	0.65	3
Coast	1	0.65	1
Eastern	5	0.65	3
North Eastern	1	0.65	1
Nyanza	3	0.65	2
North Rift	3	0.65	2
South Rift	1	0.65	1
Western	2	0.65	1
Total	20		*14

*The total increased due to rounding off of the fractions. One of the sampled colleges was conveniently picked for pilot testing of the instruments and later

excluded from the main study. The formulae used to arrive at the sample size per region were:

(i) Sampling fraction $\square n/N$ ($13/20 = 0.65$)

Where n = desired sample size; and N = the target population

(ii) Sample size (n) = regional PTTC population (N) \times sampling fraction

For example, $5 \times 0.65 = 3.25 \approx 3$ colleges

(b) Selection of Principals and Deans of Students

In stage two, the 13 college Principals and 13 Deans of Students of the sampled colleges became automatic participants in the study.

(c) Selection of students

In stage three, sampling of students was done at two levels: those who filled out the questionnaires; and those who participated in focus group discussions. Simple random sampling method with replacement was utilised to pick 2 clusters of intact second year classes with at least 40 students from each college. Where the selected classes had more than 40 students, the extra students were allowed to complete the questionnaires, but only 40 questionnaires per class were used for analysis.

After sampling the 80 students in each college, a further 12 students were systematically drawn from the second year students who had not participated in filling out the questionnaires to participate in focus group discussions (FGDs). Using class registers or class lists of about 40 students per class, the students' names were serialized from 1 to 80. Then interval size was calculated ($80/12 = 6.6 \neq 7$). A random integer between one and seven was selected; in this case, three.

Starting with the 3rd unit in the class register or class list, every other 7th student was picked to make a sample of 12 discussants.

3.5 Research instruments

Methodological triangulation or use of multiple methods of data collection from various sources rests on the assumption that the sources strengthen construct validity and reliability of the study. For this study, three sets of research instruments were designed, developed and pretested by the researcher to aid in collecting data from college students, college principals and deans of students. The three instruments were; students' questionnaire, focus group discussion guides for students and in-depth interviews for college principals and deans of students. The instruments were designed in such a way as to complement each other.

(a) Students' questionnaire

The self-administered questionnaires were preferred because of the high sensitivity of the subject on sexuality which required confidentiality. Kombo (2006) states that questionnaires are convenient in collecting confidential information and that they can be used to collect data from a large sample spread over a wide geographical area. Questionnaires also allow the person administering to explain the purpose of the study and give meaning to items that may be ambiguous (Best & Khan, 1992). As reported in the literature review, there are several themes that potentially present facilitators and barriers to adoption of HIV and AIDS prevention strategies. Thus the literature informed the content of the instruments.

In developing the questionnaire, an introduction explaining the purpose of the study and emphasizing on the importance of the respondents completing the survey was included. In addition, easy and pleasant to answer items were presented first and/or difficult ones last. Questions on the same theme were grouped together and placed under a descriptive sub-heading. Transitional statements were also included to aid in ease of answering the questions. Further to this, either a “don’t know” or “not applicable” response was provided to all questions except in those the researcher was certain all respondents would have a clear answer. This was necessary to ensure that the respondents did not feel coerced to giving answers they honestly did not know or did not want to give. For the same reasons, “other” or “none” options were included whenever either of these was seen as a logically possible answer.

The questionnaire gathered both quantitative and qualitative data; thus the items were multiple choice, numeric-open-end or text open-end that required the respondents to check a response, write a numeral or write a short descriptive statement. All the ‘Rating’ and ‘Agreement’ scales were formatted on Likert scale procedures. The anonymous questionnaire was sub-divided into four sections. Section one elicited data on social-demographic characteristics (n= 5) including gender, age, marital status, religion, and place of residence during vacations. Items contained in section two measured knowledge factors on sources of HIV and AIDS information (n = 10), HIV and AIDS transmission routes (n = 12), modes of prevention (n = 12) and adopted HIV prevention strategies (n = 8). Section three (n = 7) addressed sexual behavioural factors namely; number of current and past sexual partners, age at sexual debut, sexual intercourse in the last

three months prior to the survey and sexual practices and behaviours prevalent among college students. The last section, four, contained three items that measured individual's risk perception to HIV infection.

During construction, the survey questions were put through a “debugging” procedure in which several quality control questions were asked. These included: (a) whether respondents could easily answer the questions considering their experience; (b) whether the questions were simple, specific and sufficiently well-designed so that all the respondents would interpret them in the same way; (c) whether there were questions that could bias respondents to answer one way over another, (d) whether the question focused on a single topic or multiple topics and needed to be broken further to multiple questions; and (e) whether the listed options were mutually exclusive. The survey instrument was considered appropriate in terms of language, subject, topic sensitivity and relevance with respect to young adults.

(b) Interview guides

The semi-structured interview guides for college principals and deans of students were employed in the study because they allow for two-way conversation and discussion on a focused topic. The semi-structured nature of the instrument also guided the researcher on the core concepts to ask about and at the same time gave freedom to move the conversation in a direction of interest whenever an opportunity presented itself (Jones, 1991).

The interview guides were constructed in line with the study objectives using existing literature, theoretical and conceptual basis of the study and after intensive discussions with the supervisors. The first part of the interview guide consisted of

detailed demographic information on the interviewee such as age, gender, work experience and length of stay in the college. In the second part, the interviewees were asked to describe their own observed experiences regarding students' sexual behaviours with specific questions relating to promiscuity within college, cases of sexual harassments, cases on students' health status that could be linked to HIV infection, and cases on students' deaths that could be linked to AIDS-related diseases.

The third part focused on college administrative support in preventing spread of HIV and AIDS within and outside college. Specific data were solicited on college rules and regulations, college HIV and AIDS policy, availability of HIV and AIDS prevention education to students, and accessibility to HIV and AIDS prevention strategies such as condoms and Voluntary Counselling and Testing (VCT) services. The in-depth interviews lasted for about one hour with each interviewee.

(c) Focus group discussion guides

Focus group discussions (FGDs) allow access to research participants who may find "one-on-one, face-to-face" interaction "scary" or intimidating (Madriz, 2000). Focus group discussions were conducted with 12 student discussants in each sampled college. At each instant, the researcher acted as the moderator and was assisted by two research assistants who acted as observers and recorders during the discussions.

The FGD items were developed through discussions with the supervisors on important themes related to the study, existing related literature and the conceptual and theoretical frameworks of the study. The six-item facilitator's

guide elicited in-depth information on; HIV prevention strategies, safe sex practices, HIV and AIDS risk perceptions, HIV prevention strategies and sexual behaviours. Guideline questions and follow-up probes were used to stimulate discussions and to gain deeper in-sights into the context in which college student participate in risky sexual behaviours and what informs their preference of HIV and AIDS prevention strategies. The creation of multiple-lines of communications created a safer, tolerant, friendly and permissive environment in which individuals freely shared ideas, concerns, beliefs and perceptions in a company of people with similar characteristics.

3.6 Piloting of instruments

A pilot study is conducted on a sample who are later excluded from the sample of the actual study. The term pilot study is used in two different ways in social science research. It can refer to a 'feasibility study' which is a small scale version, or 'trial run' done in preparation for the major study (Polit, Beck & Hungler, 2001). A pilot study can also be the pre-testing or 'trying out' of a particular research instrument including questionnaires or interview schedules (Baker, 1994). The pilot study in the current research is defined as mainly a try-out of research techniques and methods, including validation of the instruments. One of the advantages of conducting a pilot study is that it helps the researcher to improve validity and reliability of the instruments and familiarise with the data collection procedures.

Cooper and Schindler (2011) opine that a sample size of between 25 to 100 subjects depending on the method to be tested would suffice for a pilot study and the respondents need not be statistically selected. Borg and Gall (1985)

recommend that researchers pilot 5 to 10 per cent of the final sample. Similarly, Mugenda O. and Mugenda A. (2003) recommend a pre-test sample of between 1 to 10 per cent of the sample. In line with these suggestions, 80 students, their principal and dean of students, from one PTTC that was later excluded from the main study participated in the pre-testing of the study instruments.

The respondents were interviewed at the end of the survey to find out their views on the survey items. This helped the researcher to identify the unanticipated problems respondents had with the survey such as terms or phrases they found confusing and items found difficult to answer. The pre-test also helped to ascertain similar interpretation of items by different respondents. The items were also tested for biasness by asking the participants to guess what the researcher was predicting the survey results to show. In items that substantially more respondents than would be expected by random chance guessed the researcher's hypothesis, the items were treated as biased or leading and were either rephrased or discarded.

3.7 Instrument validity

An instrument is valid only to the extent that its scores permit appropriate inferences to be made about a specific group of people for specific purposes. Content validity was assessed at various stages during the development of the instruments. The researcher, after reviewing relevant literature developed the instruments using similar questions to those from research studies assessing HIV and AIDS knowledge, sexual behaviours and perceptions to HIV and AIDS. Borg and Gall (1985); Morser and Kaiton (1977); Nsubuga (2000) and Tyler (1971) agree that content validity is a matter of judgement by professionals or a team of

experts. In line with this, three experienced supervisors and a statistician from the Department of Educational Administration and Planning of the University of Nairobi independently reviewed the instruments. The questionnaires, interview guides and focus group discussion guides were subjected to rating by the experts. Content Validity Index (CVI) was computed using the following formula: Average of CVI = No. of items rated valid/ All items in the instrument.

The CVI for the questionnaires for students was 50/58 which was equal to 0.86; 7/9 (0.78) for the interview guide for the principals and deans of students; and 4/5 (0.80) for the focus group discussion guide for the students. All the CVIs were within the range of 0.7 validity as recommended by Amina (2005). Hence, the instruments were considered valid for data collection. The experts reformatted the instruments and gave suggestions on wording to gain better clarity and consistency. After the experts reached a consensus that the items on the instruments reflected the real meaning of the concepts under study, a pilot test was conducted to further improve content, construct and face validity of the instruments.

3.8 Instrument reliability

An instrument cannot be valid if it is not reliable, that is, if it does not measure what it purports to measure consistently each time it measures. Reliability then is the degree to which multiple measures on a subject under the same conditions agree. The reliability of an instrument can be measured by means of stability, internal consistency and equivalence. Stability of an instrument is the extent to which the same results are obtained on repeated administrations of the same instrument (Polit & Hungler, 2008).

In the study, stability of the instruments was checked by pre-testing all the instruments in one college using test- retest method. Using Pearson Product correlation coefficient, a value of $r = .79$ was obtained for the questionnaire. A correlation co-efficient of greater than 0.7 and above is deemed adequate for survey instruments (Mugenda, A. & Mugenda, O., 2003). This implied that there were no major discrepancies in the two sets of scores; thus the instrument was stable. An inter-rater reliability using the Kappa statistics was performed to establish consistency among two raters. The inter-rater reliability was found to be (Kappa = 0.69, $p = 0.001$) for the focus group discussion guide and Kappa = 0.78 ($p = 0.007$) for the face-to-face interview guide. Landis and Koch (1977) characterisation of Kappa values as: < 0 as = no agreement; 0–0.20 = slight; 0.21–0.40 = fair; 0.41–0.60 = moderate; 0.61–0.80 = substantial; and 0.81–1 = almost perfect agreement was used to interpret the reliability values. Thus the instruments were considered suitable for the survey. The Pearson product correlation formula that was used is shown below:

$$r = \frac{\sum XY - \frac{(\sum X)(\sum Y)}{n}}{\sqrt{\left(\sum X^2 - \frac{(\sum X)^2}{n}\right) \left(\sum Y^2 - \frac{(\sum Y)^2}{n}\right)}}$$

Where;

r = Pearson correlation coefficient

x = Values in first set of data

y = Values in second set of data

n = Total number of values

Internal consistency implies that all sub-parts of an instrument measure the same characteristics (Polit & Hungler, 2008). Using Cronbach alpha, which is

used for polychotomous items, reliability co-efficient was calculated to ascertain the internal consistency of the questionnaire items. George and Mallery (2003) suggest interpretation of Cronbach alpha as: $1.0 > \alpha \geq 0.9$ excellent; $0.9 > \alpha \geq 0.8$ Good; $0.8 > \alpha \geq 0.7$ acceptable; $0.7 > \alpha \geq 0.6$ questionable; $0.6 > \alpha \geq 0.5$ poor; $0.5 > \alpha \geq 0.0$ unacceptable. So the higher the (α) coefficient the more reliable is the construct. For this study, the calculated co-efficient was between .73 and .85 for all sub-sections of the questionnaire which indicated reliability of the instrument. Equivalence was not applied to the instruments. The Cronbach formula used was:

$$\alpha = \frac{K}{K - 1} \left(1 - \frac{\sum_{i=1}^K \sigma_{Y_i}^2}{\sigma_X^2} \right)$$

Where;

σ_X^2 = the variance of the observed total test scores

$\sigma_{Y_i}^2$ = the variance of component i for the current sample of items

3.9 Operationalisation of study variables

Determinants that influence students in their preferences of prevention strategies were arrived at after extensive review of empirical and conceptual literature in line with the study objectives. In the study, the dependent variable were ‘the adopted HIV and AIDS prevention strategies’ and the independent variables were; demographic characteristics, knowledge on HIV and AIDS, sexual behaviours and risk perceptions. Kerlinger (1986) argues that any event or condition can be conceptualized as either an independent or a dependent variable. Following is a discussion of the variables that were observed in this study.

(a) Dependent variable

A dependent variable is a factor or phenomenon that is measured in a study and that which is changed by the effect of an associated factor or phenomenon. It is called 'dependent' because it "depends" on the independent variable. The dependent variable is not manipulated by the researcher; instead it is observed or measured for variation as a presumed result of the variation in the independent variable. Thus it refers to the status of the 'effect'(or outcome) in which the researcher is interested. That is, it is the response/output/"effect" which the researcher attempts to predict or explain using one or more independent variables. Following is the description of the dependent variable that was observed in the current study.

(i) Adopted HIV and AIDS prevention strategies

The HIV and AIDS prevention strategies that were measured in this study were labelled as; 1 = abstinence, 2 = being faithful, 3 = use condom correctly and consistently, 4 = testing for HIV, 5 = prompt treatment of STDs/STIs, 6 = withdrawal, 7=ask sexual history of a partner and 8= douching. Students were to choose the strategies they had adopted in order to protect themselves from contracting the virus. Multiple responses were allowed. The strategies were then categorised into; 1 = effective strategies (if a student indicated that he/she either; abstains, has remained faithful and/or uses a condom consistently and correctly); and 0 = less effective (if had not used the strategies in the 'effective' category but used one or more of these methods; test for HIV, treatment of STDs/STIs, withdrawal, ask history of partner's sex and douching).

(b) Independent variables

An independent variable is the presumed cause of the effect on the dependent variable, that is, what the researcher thinks will affect the dependent variable. It is a variable that stands alone and is not changed by the other variables measured by the researcher. It is the variable that the researcher has control over and can choose and manipulate. In non-experimental research, where there is no experimental manipulation, the independent variable is the variable that 'logically' has some effect or influence on a dependent variable (Kerlinger, 1986). When researchers cannot actually control and manipulate an independent variable, it is technically referred to as a 'status variable' (e.g., gender, age, religion). Researchers often treat status variables as independent variables (Heppner, Kivlighan & Wampold, 1999).

(i) Sociodemographic characteristics

The sociodemographic information collected on the student sample comprised their gender, age, marital status, religion and place of residence during vacation and each had its own level. In this study the variable age was categorized into three levels. The interest was to know which age groups were more likely to prefer using a given HIV prevention strategy. The categories were: late adolescence (15-19); young adults (20-24); and adults (over 25). Dataset for gender was classified as 1 = male; and 0 = female. Marital status was categorized as single (1); married (2) and separated/divorced (3). Religious affiliation was grouped into four categories; 1 = Catholic, 2= Protestant, 3 = Muslim, 4 = SDA. Lastly, place of residence was categorised as; 1 = urban, 2 = semi-urban and 3 = rural. Responses to these items assisted in assessing whether students' personal

and social characteristics had any influence on their preference of HIV and AIDS prevention strategies. The data also helped in putting the students' subsequent responses in context.

(ii) Level of knowledge about HIV and AIDS

The HIV and AIDS knowledge level was measured by correct answers to HIV transmission modes and HIV prevention methods. Knowledge level scales consisted of 24 items. Twelve "True-false- don't know" items on modes of transmission (e.g., "HIV be transmitted by sitting on a public toilet") were adapted and the respondents' answers were recorded as either "correct = 1 mark" or "incorrect = 0 mark" with "don't know" scored as incorrect. HIV prevention methods scale also had 12 items (e.g., "It is possible to protect oneself from HIV infection by having sex with one uninfected and faithful partner?"). Respondents could designate these statements as "yes" or "no". In each case, each correct answer carried 1 mark and wrong or don't know answers carried 0 marks. Thus the respondents were given scores between 0 – 24. The level of knowledge was measured by arbitrarily ranking the score. A score above 21 was considered good knowledge (i.e. a respondent giving at least 90% correct answers), from 17 - 20 (70% -89% correct answers) was labelled as moderate knowledge and those below 17 (< 70% correct answers) as low knowledge.

Comprehensive knowledge level was redefined by the ability to identify correctly at least three ways of preventing HIV infection and to reject three local misconceptions on HIV transmission. Relative importance of sources of information was measured by rating on a scale of 1 to 10 the source that had

provided most information on HIV and AIDS to students with '1' being the source that was most important and '10' the least important.

(iii) Sexual behaviours

Students' sexual behaviours were measured by level of sexual activity and sexual characteristics. Sexual activity included variables such as; ever had sex (yes, no); age at sex debut (≤ 14 years, 15 – 18 years, ≥ 19 years); sex in the last six months (yes, no) and frequency of sexual activity (sex in the last one week, one month, 3 months, more than 3 months ago). Students' sexual characteristics that were measured included; number of current and life sexual partners (1, 2 – 3, 4 – 5, ≤ 5); type of sexual partner at last sexual encounter (regular, casual, commercial sex worker) and condom use during the last sexual experience (yes, no).

The sexual behaviours were collapsed into; 0 = risky behaviours and 1= safer sex behaviours. Risky sex behaviours were defined by; having more than one sexual partner, sex with non-regular partner and not using condom during sexual intercourse. Safer sex was measured by having one uninfected faithful sexual partner, and use of condom during sexual intercourse.

(iv) Risk perceptions

Perceptions to risk were measured by three statements. Students indicated whether they knew anybody who was infected with the AIDS virus or had died of an AIDS' related diseases (yes = 1; no = 0) and whether they thought their boyfriend/girlfriend/spouse were at risk of contracting the virus (yes = 1; no = 0). In addition, the students rated their personal risks to contracting HIV infection on

a four rating scale; no chance = 1; little chance = 2; moderate chance = 3 and high chance = 4.

3.10 Data collection procedures

The general overall data collection procedure entailed obtaining a clearance letter from the Department of Educational Administration and Planning of The University of Nairobi before proceeding to obtain a research permit from the Ministry of Education authorizing the conduct of the study. As a requirement, the researcher mailed letters to all the principals of the sampled PTTCs and their respective District Education Officers (DEOs) informing them of the intended visits. In the letters to college principals appointments were booked to interview the principals, deans of students and students. Follow-up calls were made to confirm the proposed dates.

Prior to the field study, two research assistants were trained on the objectives and methodology of data collection by the researcher. Selection criterion was at least a post-graduate training in research methods. The training specifically aimed to familiarize the research assistants with sampling techniques, procedures for administration of the questionnaires and observation and note-taking techniques during the focus group discussion sessions. The training session allowed the research assistants to rehearse all the activities, develop self-confidence, enthusiasm and a realization of the benefits of the study both as an academic endeavour and as a contribution to the practical HIV and AIDS problem.

Since the research assistants had little experience in surveys dealing with sexual matters, time was spent on sensitivity training and interviewing techniques with emphasis on personal value clarifications around sexual issues. Importance

of confidentiality and research ethics were stressed. In addition, a ‘mock’ FGD was conducted with ten other invited undergraduate students as discussants. The observations made during the ‘mock’ focus group discussion were used to refine the flow of questions.

On arrival at college, the team of researchers first created rapport with the college principal who then introduced the dean of students and other college tutors to the research team. Thereafter, the research team was presented with either class lists or class registers for all second year students. The team then proceeded and selected two second year classes (80 students) who filled out the questionnaire and 12 students who participated in the focus group discussions. The team employed the sampling techniques discussed in section 3.3.

Each research assistant with the help of a college tutor presented to the sampled students the pre-tested, semi-structured questionnaires to provide anonymous feedback in a classroom setting. Before completing the questionnaires, the purpose of the study was explained to the participants and they were encouraged to respond honestly to the items. They were further informed that participation was voluntary and that their identities would be kept confidential. Each research assistant and tutor remained in the classroom and observed the entire process to discourage any discussions among students. The questionnaires were collected immediately the students completed them. As the students filled out the questionnaires, the researcher conducted interviews with the principal and dean of students each at a time, in their respective offices. The filling out of the questionnaires and each interview session took about 30 minutes and approximately 1 hour respectively.

Following the survey, 12 students (six from each class and of equal gender) who had earlier been systematically sampled were interviewed in focus group discussions. During the discussions, the researcher moderated the discussions while the two assistants took notes on the discussions and the setting. The established guidelines (refer to appendix v) were followed throughout the session. The physical setting of the discussions was either in the college library or a classroom. The research team visited each college once but where either the principal or the dean of students was unavailable for the interview on the material day, further arrangements were made for a repeat visit. All FGD sessions took one hour and were recorded verbatim.

3.11 Data analysis techniques

Data analysis involved reducing data to manageable size by developing summaries, looking for patterns and applying statistical techniques. The qualitative data collected through open-ended items in the questionnaires, in-depth interviews and focus group discussions were transcribed and analysed manually for content analysis. This involved categorising and indexing responses into common themes. Verbatim excerpts from the participants were used in the analysis to support specific arguments.

The quantitative data were entered into the Statistical Package for Social Sciences (SPSS) version 17 that was used for all analysis. The data were first cleaned for errors and inconsistent (conflicting) answers, missing entries and duplicate entries to ensure high quality data. Descriptive statistics on socio-demographic characteristics were presented to characterize the study participants. Depending on the type of variable, appropriate summary statistics appropriate for

the measurement scale were used to describe distribution of these variables. These included proportions for categorical variables such as gender, marital status and religion. These summary statistics were then presented in tables. For the normal statistical inference, bivariate analysis using a chi-square test of independence was done for HO₁, HO₂, HO₃, and HO₄.

For HO₅, regression analysis was fitted to assess how determinants that were significantly associated with HIV and AIDS prevention strategies adopted by students could predict adoption of the said strategies. This was done while controlling for any potential confounding effects by any lurking variables. For all the analyses, two-sided tests were used together with p-values of <0.05 being considered to be significant.

3.12 Ethical considerations

During the study, ethical principles of beneficence, respect for human dignity and justice were considered. The principle of beneficence requires researchers not to harm participants (Polit & Hungler in Harris, Keating, Koch, Nilvarangkul & Tangpukdee, 2010), not to exploit participants and that the benefits of research should exceed risks (risk/benefit ratio).

Ethical clearance to conduct the study was granted by the Department of Educational Administration and Planning of the University of Nairobi, the Ministry of Education and the District Education Officers (DEO) in the districts where participating PTTCs were located. The Principals of the selected colleges also granted written permission for data to be collected from their respective colleges.

The principle of respect for human dignity requires that the right to self determination and full disclosure are respected. Rees (1991) argues that this principal finds expression in form of informed consent where the study participants are fully informed about the research and any danger (physical or psychological) that they may experience. Before filling out the research instruments, the respondents were explained to the purpose of the study. Considering the sensitive nature of the topic under study, respondents were informed that participation was voluntary and that they may omit answers to particular questions if they chose to. However, to encourage full participation, the respondents were explained that as part of a carefully selected sample, their every response counted to ensure validity of the study.

The principle of justice demands fair treatment during sample selection and the right to privacy. To achieve this, random sampling techniques were employed to ensure that the sample was not biased in any way. No identifying information like signed consent was required from the respondents and confidentiality was ensured throughout the research process. The anonymous nature of the questionnaire ensured that the report did not associate the responses to individual respondents or particular colleges, thereby, concealing their identity from the public. Informed consent was implied by voluntary return of the questionnaire and openness during the discussions. The completed instruments were kept under lock and key and would be destroyed after the acceptance of the research report.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

Chapter four contains statistical analysis and the study findings as they relate to each study objective and hypothesis. The purpose of the study was to investigate determinants that influence students in PTTCs to adopt HIV and AIDS prevention strategies. A three phase methodological approach was employed in analysing data. In phase one, descriptive statistics using frequencies, percentages and standard deviations was used to determine the most important determinants in regard to adoption of HIV and AIDS prevention strategies. The results were used for analysis in phase two.

In phase two, correlation analysis was conducted to show the relationship between the independent and the dependent variables. This involved testing of the hypotheses using the chi-square test of independence. Significance of test results is reported in the three ways suggested by Coolican (1990) based on the probability level: 'significant': $0.05 > p < 0.01$; 'highly significant': $0.01 > p < 0.001$; and 'very highly significant': $0.001 > p$. All probabilities reported are based on two-tailed tests.

In the last phase, multiple regression analysis was carried out between the students' adopted HIV and AIDS prevention strategies and the correlated variables in phase two. This was done to ascertain the deterministic relationship between the variables, that is, to find out how the variables that significantly correlate with the students' adopted HIV and AIDS prevention strategies influence students' adoption of the said strategies.

4.2 Instruments' response rate

After excluding 30 questionnaires that had more than 20 percent missing items, 1010 (97.1%) were retained for analysis. Thirteen (100.0%) focus group discussions were held with the students. In addition, 13 (100.0%) and 12 (92.3%) face to face interviews were conducted with deans of students and college principals respectively. A response rate of 70 percent and over is considered excellent (Mugenda O. & Mugenda A., 2003). The instruments' return rate in this study was excellent and, therefore, suitable for analysis.

4.3 Socio-demographic characteristics of the students

Socio-demographic information collected from the participants comprised their gender, age, marital status, religion and their place of residence during vacation. The data were used to assess whether the selected variables were related to students' adopted HIV and AIDS prevention strategies. In addition, the data helped in putting the students' subsequent responses in context. Descriptive statistics on students' characteristics are presented in Tables 4.1 and 4.2.

Table 4.1

Cross-tabulation of students' demographic characteristics

Variable		Gender		Total (%)
		Male (%)	Female (%)	
Age	Below 19 yrs	178 (37.6)	283 (52.7)	461 (45.6)
	20 – 24 yrs	249 (52.6)	220 (41.0)	469 (46.4)
	Over 25 yrs	46 (9.7)	34 (6.3)	80 (7.9)
Total		473 (46.8)	537 (53.2)	1010 (100)

Table 4.1 indicates that slightly over half (53%) of the students were female indicating a near gender parity in public PTTCs. About 46.4 percent of the students were within the ideal college-going range of not older than 24 years and female students tended to be younger (52.7%) than their male counterparts (37.6%). These ages are similar to those found in several studies across the world (Ojudo, 2003; Jing, Soyeon, Barber & Lyons, 2007). The social characteristics of the students are presented in Table 4.2.

Table 4.2

Distribution of students in PTTCs by selected demographic characteristics

Variable	n	Percent	
Marital status	Single	815	80.7
	Married	183	18.1
	Separated	12	1.2
	Total	1010	100.0
Religion	Catholic	398	39.4
	Protestant	504	49.9
	SDA	73	7.2
	Islam	35	3.5
	Total	1010	100.0
Residence	Rural	640	63.4
	Semi-urban	186	18.4
	Urban	184	18.2
	Total	1010	100.0

Majority (80.7%) of the students were single. The findings are a typical reflection of marital status of students in colleges. Kalawole (2010); Mosco and Pistole (2008) and Nasidei, Ng'ang'a, Mwangi and Wanzala (2011) found 90 percent, 90.4 percent and 94.6 percent of college students to be single in that order. This possibly explains why most HIV prevention interventions focusing on young adults have abstinence as the central theme. Conventional African norms also prohibit sexual activities among the unmarried.

College students were mainly of either Catholic (39.4%) or Protestant (49.9%) faith. Only a few (3.5%) were affiliated to Islamic faith. A follow up question on frequency of church/mosque attendance revealed that most students were committed to their faith. About 84.6 percent of students stated that they attended their various places of worship either always or often. The findings contrast what has been hypothesized in most studies that students' experience a decline in religious commitments after entering college (The Pew Forum, Diocese of Peterson, 2012)

About 63.4 percent of the students resided in rural areas during vacations with only a small proportion (18.2%) residing in urban areas. These distributions are characteristic of the general Kenyan population distribution where majority of the people (77.8%) live in rural areas (World Bank report, 2012).

4.4 Description of the dependent variable

This section gives a detailed description of the dependent variable conceptualised as effective and less effective HIV and AIDS prevention strategies. Effective strategies include; abstinence, remaining faithful to one sexual partner or decreasing the number of sexual partners and using condoms

consistently and correctly if sexually active (UNAIDS, 2006; GHIVPWG, 2006). Other HIV strategies when used alone are less effective. Among them are testing for HIV status and prompt treatment for STDs and STIs.

4.4.1 HIV and AIDS prevention strategies adopted by the students

A key indicator to track sexual behaviour change in students is to measure the kinds of HIV and AIDS prevention strategies they have adopted. Students were asked to tick from a list all the strategies they usually employed. The information is presented in Tables 4.3 through 4.7.

Table 4.3

HIV and AIDS prevention strategies adopted by students by gender

Strategy	Gender		Total
	Male (473)	Female (537)	
Testing for HIV	393 (83.08)	480 (89.39)	873 (86.44)
Douching	296 (62.58)	314(58.47)	610 (60.40)
Treatment of STD/STI	288 (48.20)	304 (56.61)	592 (58.61)
Always use condom	268 (56.66)	261 (48.60)	529 (52.38)
Fidelity	181 (38.27)	172 (32.03)	353 (34.95)
Abstinence	78 (16.49)	130 (24.21)	208 (20.59)
Withdrawal	127 (26.85)	76(14.15)	203 (20.30)
Ask sexual history	47 (9.94)	24 (4.47)	71 (7.03)

n = 1010

Over half of the male students (56.66%) used condoms all the time they engaged in sexual intercourse. These percentages were higher than those

documented in the KDHS (2003) and in KAIS (2009) studies. However, they were not as high as in the United States; [67.0% of males; 49.0% of females] (Wetti, Wildsmith & Manlove, 2011). Low condom use (40%) has been reported among South African young adults (Setsuko et al, 2007) and among Philippine's 21 to 30 year olds (Lucea et al, n.d).

Abstinence was very low in males (16.49%). The results are similar to those recorded in a National Survey of Family Growth in United States among 15 to 24 year between 2006 and 2008, (Chandra, Mosher & Copen, 2011). Higher proportions among females could be explained by the socialization process where most communities stress virginity for women. However, the percentages are still very low to avert HIV infection.

About 38.27 percent of males reported practising fidelity. The findings are inconsistent with those found in many studies where male respondents reported more than one concurrent partner (Adedeji, Titilayo, Bulogun & Maiza, 2009; Athoric Relief Services, 2012). In Cameroon and Rwanda, a higher number of women (37.0% and 79.0%) were practicing faithfulness compared to 9.0 percent and 35.0 percent of the men in the two countries (Mistra et al, 2009). The data on prevention strategies was then disaggregated by age as shown in Table 4.4.

Table 4.4**HIV and AIDS prevention strategies adopted by students by age**

Strategy	Age group in years			Total
	Below 19 (461)	20–24 (469)	Over 25 (80)	
Testing for HIV	401 (85.32)	404 (87.83)	68 (85.00)	873 (86.46)
Douching	266 (56.60)	294 (63.91)	50 (62.50)	610 (60.40)
Treat STD/STI	259 (55.11)	283 (61.52)	50 (62.50)	592 (58.61)
Always use condom	227 (48.30)	270 (58.70)	32 (40.00)	529 (52.28)
Fidelity	162 (34.47)	171 (37.17)	20 (25.00)	353 (34.95)
Abstinence	122 (25.96)	80 (17.39)	6 (7.50)	208 (20.59)
Withdrawal	89 (19.31)	93 (19.83)	21(26.25)	203 (20.30)
Ask sexual history	26 (5.53)	40 (8.70)	5 (6.25)	71 (7.03)

n = 1010

When the sample was examined by age, particular patterns became apparent. Younger students below 19 years (25.9%) were more likely to abstain from sex and practice fidelity (34.47%) than the older students in the age range of 25 years and above. Older students were also less likely to report condom use (40.0%). Overall, it was observed that the older students least practiced the three proven HIV and AIDS prevention strategies. Although majority (86.44%) of the students had taken a HIV test and seemed to know their sero-status, a high percentage was

not using any of the three effective HIV prevention strategies; and this is likely to jeopardize their lives.

Results in Tables 4.3 and 4.4 illustrate that most college students had not embraced effective HIV prevention strategies. On the whole only 52.38 percent of the students indicated using a condom all the time they engaged in sexual intercourse; remaining faithful to one faithful uninfected partner (34.95%); and abstaining (20.9%). As reported in most studies, abstinence, though a 100 per cent effective in preventing sexual transmission of HIV is difficult to achieve for it requires great commitment, high motivation and strict self control.

The high percentage (80.00%) of students who had tested for HIV was not surprising given that most PTTCs either provide mobile VCT services to students or establish linkages with local clinics and NGOs (Nzioka, Kirongo & Njiru, 2007).

The students' adopted strategies were disaggregated by marital status and the results presented in Table 4.5.

Table 4.5**HIV and AIDS prevention strategies adopted by students by marital status**

Strategy	Marital status			Total
	Sing. (815)	Married (183)	Separat./divorce (12)	
Test for HIV	743 (91.17)	123 (67.21)	7 (58.33)	873 (86.46)
Douching	456 (55.95)	150 (81.98)	4 (33.33)	610 (60.40)
Treat of STD/STI	462 (56.69)	121 (66.12)	9(75.00)	592 (58.61)
Uses condom	474 (58.16)	52 (28.42)	3(25.00)	529 (52.28)
Fidelity	242 (29.69)	103 (56.28)	8 (66.67)	353 (34.95)
Abstinence	122 (25.96)	80 (17.39)	6 (7.50)	208 (20.59)
Withdrawal	104 (22.13)	98 (53.55)	1 (8.33)	203 (20.30)
Ask sexual history	53 (6.50)	10 (5.46)	8 (66.67)	71 (7.03)

n = 1010

Table 4.5 presents students' responses as examined by marital status. Single students were more likely to use condoms (58.16%) and abstain (25.96) compared to the married and the separated/divorced students. The percentage of married students practicing fidelity (56.28%) was lower than would normally be expected. This confirms the findings from The Kenya AIDS epidemic UPDATE (2012) that married couples are three times more likely to become infected than sex workers. Married students in this study had low percentages of condom use (28.42%) despite being unfaithful. Ntozi et al. (2003) found high incidence of extramarital

activities and STIs among the married. If married people are not to remain faithful to one another or use protection if unfaithful, then marriage will be a death bed. Overall, it was observed that abstinence was the least practiced strategy across marital status categories. In summary, there were no marked differences in adopted HIV and AIDS strategies in terms of marital status.

It was apparent from the discussants in the FGDs that students were not ready to abstain from sex. One male student said, “One should enjoy sex while young. It is common to have one girlfriend in college and another at home. However, one should be responsible and use a condom.” [Male 25 years]

The students were cognisant that in the face of multiple partnerships, condoms are an effective measure against infection although they were not ready to use them consistently. A female student put this more succinctly, “Condoms can prevent HIV but we use them with my boyfriend only during my unsafe days. I know withdrawal can prevent pregnancy but I prefer a condom. One can still get pregnant even if the man withdraws.” [Female discussant 21 years]

4.5 Knowledge levels of HIV and AIDS prevention strategies

It is hypothesized that prior to young adults deciding to protect themselves from HIV infection, key antecedents of behaviour change such as knowledge must change first. In this section, antecedents that lead to adoption of HIV and AIDS prevention strategies such as knowledge about HIV transmission modes and prevention strategies were examined. In addition, sources that help to explain misconceptions students hold about HIV and AIDS were assessed and measures computed to gauge comprehensive knowledge that students possess.

4.5.1 Sources of HIV AIDS information

Credibility of the source of information is important because not all 'information' is authoritative, objective, valid, reliable, timely or comprehensive (Kentucky Virtual library, 2004). Future trends of HIV to a large extent will depend on levels of knowledge. Absence of valid sources would result to insufficient knowledge about HIV prevention and this has implications on spread of HIV. To measure the relative importance of sources of HIV information, students were asked to rate on a scale of 1 to 10 the source that had provided most information to them with '1' being the most important source and '10' the least important. The rankings are shown in Table 4.6

Table 4.6

Mean ratings on importance of sources of HIV and AIDS information

Source	n	Mean	Std deviation
Radio	801	3.18	2.471
Teacher	772	4.11	2.689
Television	763	4.25	2.732
Parents	761	4.72	2.906
Health personnel	762	5.02	3.169
Public posters	748	5.34	3.033
Newspapers	751	5.39	2.809
Religious leaders	778	5.55	3.050
Friends	758	5.58	2.849
Politicians	770	8.65	2.724

n = 1010

Table 4.5 presents a comparison of relative ranking of sources of HIV and AIDS information in order of importance as indicated by the students. The students ranked radio (3.18; $\sigma \pm 2.47$) as the most important source, then teachers (4.11; $\sigma \pm 2.69$), followed by television (4.25; $\sigma \pm 2.73$). Religious leaders, friends and politicians were rated as relatively unimportant sources of HIV and AIDS information in the decreasing order of magnitude.

Results indicated that students received HIV and AIDS information from a variety of sources. The ranking indicate that students gave most credence to electronic sources as well as teachers. However, the former sources may lack a solid scientific background. The health personnel, a source that is based on solid scientific background was accorded relatively less importance. Friends and politicians were rated as the least important sources showing that students had mistrust of information provided by the two sources. These findings are consistent with those of similar studies that have focused on young adults in colleges and universities (Maureed & Tasanapradit, 2009; Nasir et al, 2008; Mwanguru, 2008; Wong et al.,2008; Asmare and Moges, 2006; Saller, 2009; Adetoro, 2009; Ajayi & Omatayo, 2010; and Idayat, 2012).

The importance of electronic media as a source of information was well captured during the FGDs. However, it was clear that as much as media provided constructive HIV messages, it also encouraged promiscuity. A male member of the FGD said, “The adverts on television on condoms are good for awareness. But there are other programmes such as ‘soaps’ that show people having sex without using condoms. The media is full of pornographic materials. What message are

they sending to the youth?” With such strong allegations on media, it would then be necessary to evaluate the role of media in curbing HIV pandemic.

4.5.2 Knowledge levels on HIV and AIDS transmission modes

The HIV and AIDS knowledge scale consisted of 12 “true-false–don’t know” items on modes of transmission. In each case, each correct answer carried 1 mark and wrong or don’t know answer carried no mark. Table 4.7 presents the expected responses on each item by gender while Figure 4.1 presents categories of students’ scores.

Table 4.7

Students’ correct responses on HIV transmission modes by gender

Mode of transmission	Answer	Gender (%)		Total (%)
		Male	Female	
		(n-473)	(n= 537)	
Vaginal sex	True	466(98.52)	533(99.26)	999(98.91)
Shake hands with +HIV	False	450(95.14)	529(98.51)	979(96.93)
Hug HIV infected persons	False	448(94.71)	526(97.95)	974(96.44)
Use needles	True	464(98.10)	493(91.81)	957(94.75)
Transfuse blood	True	462(97.67)	489(91.06)	951(94.16)
Mosquito bites	False	469(99.15)	458(85.29)	927(91.78)
Sit on public toilets	False	432(91.33)	489(91.06)	921(91.19)
Share utensils such as plates	False	426(90.06)	490(91.25)	916(90.69)
Sweat	False	427(90.27)	474(88.27)	901(89.21)
Anal sex	True	443(93.66)	431(80.26)	865(85.64)
Saliva	False	252(53.28)	290(54.00)	542(53.66)
Kissing	False	254(53.70)	235(43.76)	489(48.42)

n= 1010

The students' self reported data in Table 4.5 shows that most students knew that HIV is transmitted through unprotected vaginal sex (98.91%), sharing unsterilized needles (94.75%) and receiving a transfusion of untested blood (94.16). However, a substantial number still held misconceptions that the AIDS virus can be transmitted through saliva (46.34%) and through kissing an infected person (51.58%). When data were disaggregated by gender, no substantial variations by correct responses were observed. These findings indicate that majority of students were well aware of HIV and AIDS transmission routes. The findings are consistent with studies conducted among 15 to 24 years old by UNAIDS (2007); Sarker et al, (2005); Milkowski and Slinger (2005); and Xiaoming et al (2004). The knowledge gap in all these studies pointed that students still hold misconceptions on HIV transmission. Misconceptions are important in adopting effective prevention strategies. Students' scores on HIV transmission are presented in Figure 4.1.

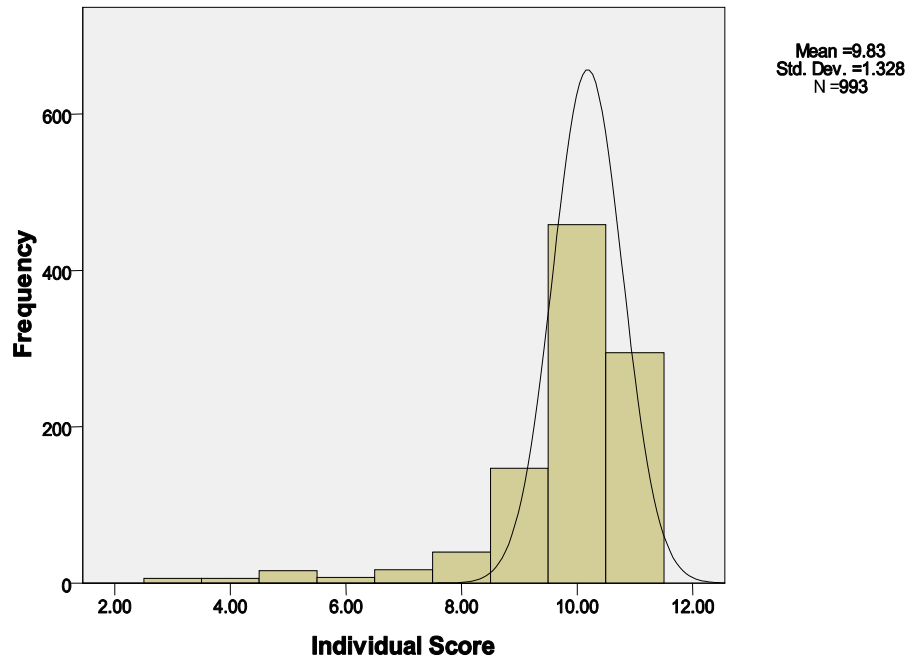


Figure 4.1: Students’ HIV modes of transmission scores

Figure 4.1 depicting the continuum of scores revealed that the peak score interval was between 10 and 11. The distribution of the scores is negatively skewed (-2.39) with most of the scores on the higher ranges. This showed that students were well versed on most of the HIV and AIDS transmission routes.

4.5.3 Knowledge of HIV and AIDS prevention strategies

Knowledge on HIV and AIDS prevention strategies, was assessed through 12 statements that required a “Yes” or a “No” response. Percentages of correct responses on each item by gender are presented in Table 4.8.

Table 4.8**Correct responses on HIV and AIDS prevention strategies by gender**

Answer	Prevention strategy	Male(n=473)				Female(n=537)	
		n	%	n	%	n	%
Total(n=1010)							
Yes	Remain faithful	440	93.02	512	95.34	952	94.26
No	Not donate blood	405	85.62	467	86.96	872	86.34
Yes	Sterilized needles	411	86.89	489	91.06	900	89.11
No	Not attend discos	344	72.73	378	70.39	722	71.49
Yes	Abstaining	409	86.47	470	87.52	879	87.03
No	Attend church	315	66.60	355	66.11	670	66.34
Yes	Use condoms	398	84.14	444	82.68	842	83.37
Yes	Reducing sex partners	278	58.77	308	57.36	586	58.02
Yes	Preventing MTCT	241	50.95	280	52.14	521	51.58
Yes	Test for sero- status	390	82.45	449	83.61	839	83.07
No	Take lemon drinks	427	90.27	490	91.25	917	90.79
No	Select healthy partner	160	34.30	166	31.30	326	32.70

n = 1010

The top three correct strategies identified by the students included: having sex with one faithful partner (94.26%); using sterilized needles (89.11%); and abstaining from sexual intercourse (87.03). Incorrect strategies were also identified by a substantial number of students. About 33.66 percent and 67.3

percent of students thought that attending church regularly and praying; and selecting a healthy-looking person were adequate measures against HIV infection. Although majority of students knew that fidelity, abstinence and correct and consistent condom use were effective against HIV infection, very few students were practicing the same as indicated in Table 4.4.

Scores on knowledge about HIV prevention were measured and presented in Figure 4.2.

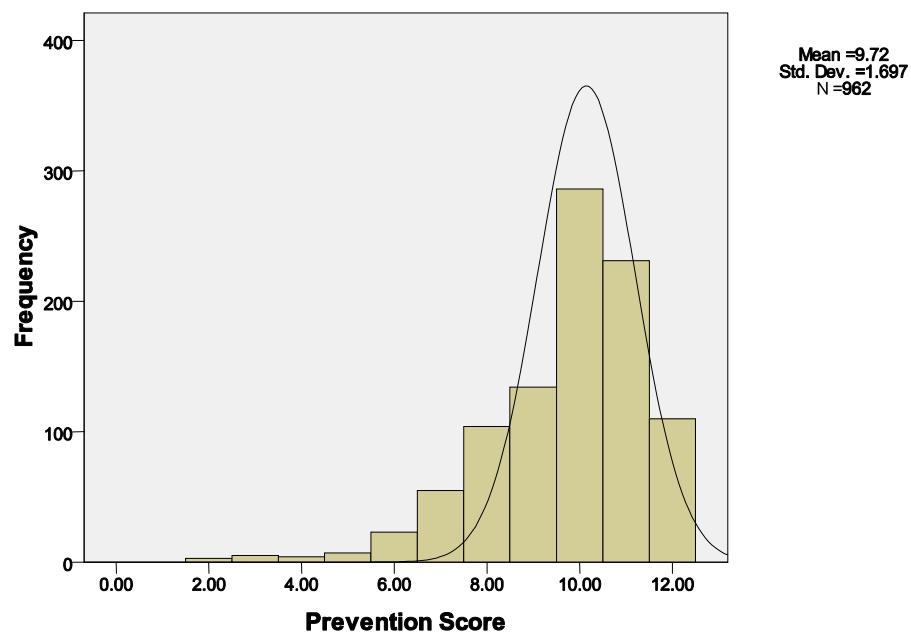


Figure 4.2: Students' HIV prevention scores

Figure 4.2 revealed that the peak score interval was between 10 and 11. The distribution of the scores was negatively skewed (-1.17) with most of the scores on the higher ranges. This showed that students were well versed on most of the HIV and AIDS prevention strategies.

4.5.4 Combined students' scores on HIV prevention knowledge

The maximum score a student would have achieved was 24 from both the transmission and prevention items. To measure levels of knowledge, scores were arbitrarily ranked. A score of 21 and above was considered good knowledge (i.e. a respondent giving at least 90% correct answers); from 17 - 20 (70% -89% correct answers) was labelled as average knowledge; and below 17 (< 70% correct answers) as poor knowledge. Table 4.9, Figure 4.2 and 4.3 present the descriptive analysis of the combined scores.

Table 4.9

Summary of students' transmission and prevention knowledge scores

Knowledge	n	Mean	SD	Max.	Min.	Range	Skew
Transmission	993	9.83	1.33	11	3	8	-2.39
Prevention	962	9.72	1.70	12	2	10	-1.17
Trans + Prev.	953	19.55	2.13	23	8	15	-1.07

The mean HIV and AIDS knowledge on prevention and transmission score for the 953 students who responded to the items was 19.55 (SD =2.14) on a scale of 24. The range was 15, with the highest score as 23 and the lowest score as 8. The students scored better in transmission than in prevention items. This shows that students are less knowledgeable on how to prevent themselves from the virus. The extremely low scores (2, 3, 8) are worrying. This would be least expected since these are teachers in the making expected to be knowledgeable themselves in order to impart HIV knowledge to pupils.

To get a clear picture of knowledge levels of the students, the scores were categorised as good, average or poor knowledge using the arbitrary scale designed for this study. The categorical rankings are presented in Figure 4.3.

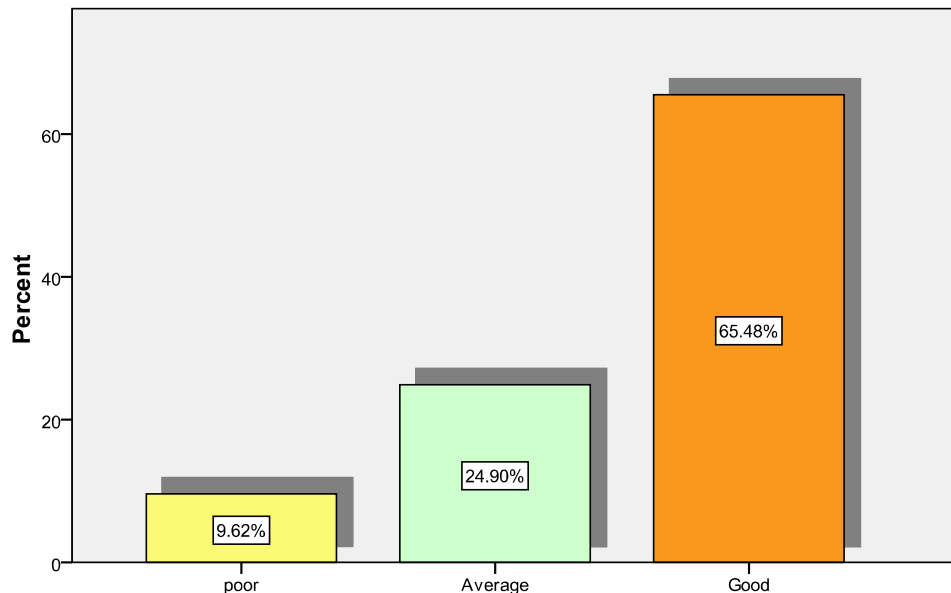


Figure 4.3: Categories of student total scores on knowledge levels of HIV

The students were categorised as having either ‘good’, ‘average’ or ‘poor’ knowledge according to the pre-determined criteria. A substantial percentage of students (34.52%) had between average to poor knowledge. This has implications on adoption of effective HIV strategies. Students with inadequate knowledge are bound to ignore prevention strategies or adopt ineffective ones. The findings were inconsistent with most studies where large percentages of college students score very high on HIV knowledge. Sutton et al. (2011) found that 82 percent of students had average to high HIV knowledge scores. Figure 4.4 shows the normality of the data on the knowledge scores.

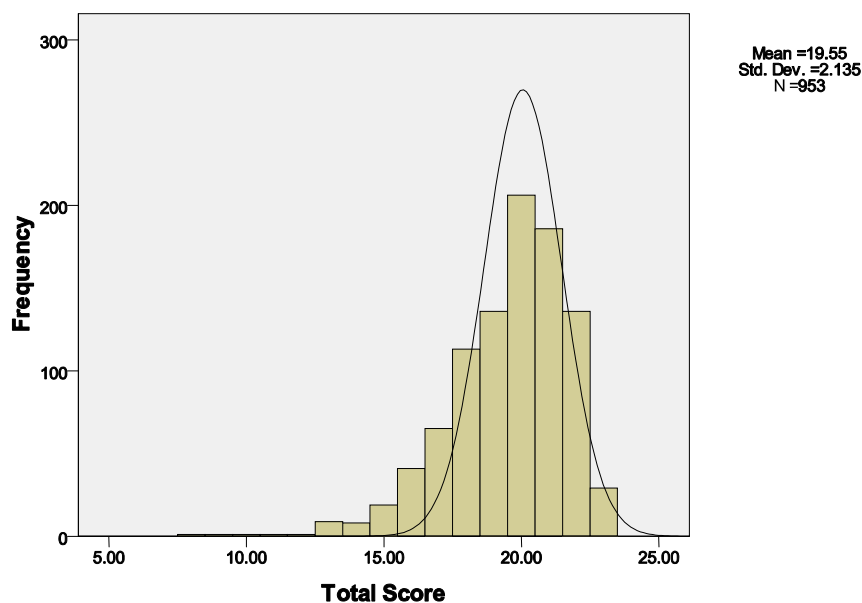


Figure 4.4: Total score on knowledge levels of HIV and AIDS

A histogram depicting the continuum of scores reveals that the peak score interval was between 19 and 21. The distribution of the scores is negatively skewed, with most of the scores on the higher ranges. This means that there were students with adequate knowledge and a few with very low knowledge. According to the scale set, most students had average and good knowledge.

4.5.5 Comprehensive correct knowledge levels on HIV and AIDS

According to UNESCO, having comprehensive knowledge means that a student is able to correctly identify two major methods of preventing the sexual transmission of HIV and reject three most common local misconceptions. In this study comprehensive correct knowledge was defined by the ability to identify correctly the three effective strategies of preventing HIV infection and to reject three local misconceptions on transmission. These included; abstinence, fidelity

and correct consistent condom use. The local misconceptions included; HIV transmission through kissing, shaking hands with infected persons and through mosquito bites. The observed results are presented in Table 4.10.

Table 4.10

Percentage of students with HIV and AIDS comprehensive correct knowledge

Score	Gender		Total
	Male	Female	
0	1 (0.21)	0 (0.00)	1 (0.01)
1	3 (0.63)	1 (0.19)	4 (0.39)
2	5 (1.06)	5 (0.93)	10 (0.99)
3	14 (2.95)	7 (1.30)	21(2.08)
4	83 (17.55)	120 (22.35)	203 (20.10)
5	212 (44.82)	239 (44.51)	453 (44.85)
6	155 (32.77)	165 (30.73)	320 (31.68)
Total	473 (99.99)	537 (100.01)	1010 (100.00)

Data in Table 4.10 indicates that one male student (0.10%) scored a zero on all the six items. Slightly more (155 = 32.77%) male students than female students (165 = 30.75%) exhibited comprehensive correct knowledge. The findings agree with those that appear in the Kenya National Bureau of Statistics (2010) that young women possess lower comprehensive correct knowledge levels (48%) than their male counterparts (55%). On the whole, only 320 (31.70%) of students had comprehensive correct knowledge on HIV prevention. These levels are low to

meaningfully equip students to fully cushion themselves against HIV infection. The percentages compares with the general trend found in young adults on comprehensive correct knowledge in African countries.

Information gathered across the qualitative instruments suggested very high knowledge levels of HIV. Student discussants from various colleges agreed that there were about adequate HIV and AIDS materials in colleges including posters. They said that tutors and deans of students were available for consultation on HIV and AIDS matters but students rarely consulted tutors on HIV and AIDS issues outside of the classroom. The college administration was evaluated as very supportive of the HIV and AIDS education. Principals expounded on the kinds of support administration gives. Most of them pointed out that colleges distribute HIV and AIDS materials such as posters, magazines, pamphlets and text-books to students whenever they receive such. In addition, life skill subject is taught to all students; students are encouraged to be peer educators; and tutors are facilitated to attend workshops and seminars related to HIV and AIDS. With this kind of support, students were expected to exhibit very high knowledge levels.

4.6 Students' sexual behaviours and adopted HIV and AIDS prevention strategies

A major factor associated with HIV transmission is risky sexual behaviour that includes variables like; concurrent multiple sexual partners, serial monogamy, non-use of condoms and commercial sex. To determine the extent to which students' sexual behaviours were associated with the HIV and AIDS prevention strategies, behaviours that directly impact on HIV infection were measured.

Sexual behaviour was defined by level of sexual activity and sexual characteristics of students.

4.6.1 Sexual activities engaged in by students

Sexual activities of the students were measured by variables such as; ever had sex, age at sex debut, sex in the last three months and frequency of sexual activity. The profile of students sexual activities, especially those that place them at risk of HIV infection are presented in Table 4.11.

Table 4.11

Cross-tabulation of students' level of sexual activity by gender

Sexual activity	Response	Gender		Total n=1010
		Male (n=473)	Female (n=537)	
Ever had sex	Yes	355 (75.05)	362 (67.41)	717 (71.00)
	No	78 (16.49)	130 (24.21)	208 (20.59)
Total		433 (91.54)	492 (91.62)	925 (91.58)
Age at first sex	14 yrs or less	118 (33.24)	20 (5.52)	138 (19.25)
	15 to 18 yrs	140 (39.44)	97 (26.80)	237 (33.05)
	Over 19 yrs	97 (27.32)	245 (67.68)	342 (47.70)
Total		355 (100)	362 (100)	717(100)
Sex in last six months	Yes	359 (75.90)	387 (72.07)	746 (73.86)
	No	84 (17.76)	127 (23.65)	211 (20.89)
Total		443 (93.66)	514 (95.72)	957 (94.75)
Latest sex	A wk ago	39(10.86)	42(10.85)	81 (10.86)
	A month	85 (23.68)	136 (35.14)	221 (29.63)
	3 months	67 (18.66)	81 (20.93)	148 (19.84)
	>3months	168 (46.80)	128 (33.07)	296 (39.68)

Age at first sexual experience

The proportion of students who report delaying sex to a late age is an important indicator of HIV prevention. The World Health Organization has chosen age 14 years and less as an indicator of early age at first sex. In this study about a fifth (19.25%) of students had had sexual intercourse at an early age while almost a half (47.70%) of the student stated that they had their first sexual experience at a mature age of 19 years and over. This is a time when majority of teenagers start college life.

This high sex initiation can be explained by the fact that college life is marked by increased sexual exploration and experimentation (Adedeji, Titilayo, Balogun & Mainza, 2009; Marlene & Marlene, 2008). Findings in this study support The National Centre for Health Statistics (2005) study that revealed that by the age of 23 years, most (90%) people are usually sexually experienced. Grunseit and Richer (2000) and Kalawole (2010) posit that most students initiate sex in their first year in university.

Sex in the last six months

A follow up question on the sexually active students on whether they had engaged in sexual intercourse in the last three months prior to the study was posed. This is a key indicator in tracking behaviour change on the number of young adults who had ever had sex but had not had sex in the past 6 to 12 months. This is referred to as secondary abstinence. This measure is important for it is more sensitive to behaviour change as it measures recent sexual activity, thus recent exposure to HIV infection. It captures people who may have chosen to change their behaviour by refraining from sex.

Data in Table 4.10 shows that slightly more students (73.86%) indicated they had had sex within the last three months than those who had reported to have ever had sex (71.00%). This can be explained by the fact that students had been given the freedom to skip questions they felt not comfortable to answer. In addition, under-reporting of sexual activity was highly possible due to the sensitive nature of the study. The inconsistencies as observed could be due to sexually active students denying that they had 'ever had sex'. More males (75.90%) were also likely to report having had sex in the last six months than females (72.07%).

Latest sexual encounter

Being sexually active is not always followed by a regular sexual involvement (Shisana et al, 2005). In this study, although majority of students (73.86%) said they had been sexually active within the last six months prior to the study, a significant number (males= 46.80%; females=33.0%) were not having a lot of sex and their last sexual encounter was more than three months ago. These findings agree with the findings by Pettifog et al (2004) who found that 17 percent of students who had ever had sex had not had sex in the last twelve months before that study was conducted.

4.6.2 Sexual characteristics engaged in by students

Students' sexual characteristics that were measured included; number of life sexual partners, number of current sex partners, type of sexual partner at last sexual encounter and condom use during the last sexual experience. Table 4.12 presents the data.

Table 4.12**Cross-tabulations of students' level of sexual characteristics by gender**

Sexual characteristic	Response	Gender		Total (%)
		Male (%)	Female (%)	
No. of sexual lifetime partners	1	130 (33.59)	176 (45.01)	306 (39.33)
	2-3	98 (25.33)	138 (35.29)	236 (30.33)
	4-5	42 (10.85)	41 (10.49)	83 (10.67)
	>5	117 (30.23)	36 (9.21)	153 (19.67)
Total		387 (100.00)	391 (100.00)	778(100.00)
No. of current sexual partners	1	260 (70.65)	309 (85.60)	569 (78.05)
	2-3	90 (24.46)	41 (11.36)	131 (17.97)
	4-5	4 (1.09)	6 (1.66)	10 (1.37)
	>5	14 (3.80)	5 (1.38)	19 (2.61)
Total		368 (100.00)	361(100.00)	729(100.00)
Partner type during sexual encounter	Regular	274 (76.32)	303 (78.29)	577 (77.35)
	Casual	74 (20.61)	69 (17.83)	143 (19.17)
	CSW	11 (3.06)	15 (3.88)	26 (3.49)
Total		359 (99.99)	387 (100.00)	746(100.00)
Condom use in last sexual intercourse	Yes	156 (43.45)	161 (41.60)	317 (42.49)
	No	203 (56.55)	226 (58.40)	429(157.51)
Total		359 (100.00)	387(100.00)	746(100.00)

Number of life-time sexual partners

It is hypothesized that the greater the number of sexual partners people have, the greater their potential exposure to HIV infection will be. Partner reduction has

been proven as key to minimizing HIV risks. Among the sexually active students 39.33 percent reported having one lifetime sexual partner while the rest had had more than two. This shows that about two in three students were at risk of HIV infection. More males (66.41%) than females (54.99%) reported having had more than two sexual life partners. Studies show that men are more open about their sexual life and tend to report higher numbers of sexual partners than women (Eaton et al., 2003; Hartnell, 2005; Shinana et al., 2005).

Number of current life partners

Whereas lifetime number of sexual partners provides insight into the lifetime risk a college students has been exposed to, the number of sexual partners they currently have better reflects their sexual behaviours. About 70.65 percent males and 85.60 percent of female students reported having only one sexual partner at the time of the study. This shows a reduction in number of sexual partners. The current decline in HIV prevalence in countries with high HIV prevalence has been attributed to positive behaviour change among young adults (UNAIDS, 2011). The findings are also in agreement with those in most studies where significant declines in number of sexual partners have been observed among young adults (National Centre for Health Statistics, Fertility, Family Planning and Reproductive Health, 2005; Zeba et al, 2004).

Type of sexual partner during last sex

Three types of sexual partners were measured in this study. Regular partner was defined as a spouse, boyfriend or girlfriend; casual partner was taken to be a person one had met and had sex with within a short period of time of between one

day and a week and after which no sexual relationship developed while commercial sex worker (CSW) referred to paid sex.

As observed from Table 4.12 majority of students (77.35%) had had last sex with their regular partners. This indicated that most college students were in stable relationships and cognisant with dangers of engaging in sex with ar-risk-groups. Only 26 (3.49%) of sexually active students had had sexual intercourse with a commercial sex worker. When data was disaggregated by gender almost an equal number of males (11 = 3.06%) and females (15 = 3.88%) had engaged in paid sex.

Condom use during last sex

Consistent and correct condom use is a key indicator that students have adopted an effective HIV prevention strategy. To assess this, students in the study were asked whether they had used a condom during their last sexual intercourse. About 42.49 percent said they used a condom with slightly more males (43.45%) than females (41.60%) indicating usage. A substantial number of sexually active students were not using condoms. However, the decrease in number of sexual partners, regular partnerships and condom use among the students are indicators that students in PTTCs had embraced some form of HIV prevention.

Discussants across groups and the face-to- face interviews had mixed views on students' sexual behaviours. Some were of the view that students engage in sexual activities that put them at risk of HIV infection while others thought that fellow students were no longer careless about sex. A male discussant said: "I used to date many girls but soon I realised the risks involved. My friends warned me about

AIDS. I listened to them. For the last nine months I have been with one girlfriend”.

This argument was countered by a male student who was of the opinion that students, especially males were engaging in risky sexual practices. He posed:

“... Some of us (students) still fancy dating many girls as long as they do not get to know one another. Students go out on weekends to have fun (sex) with other dates who are not their regular girlfriends. Having a different partner for a change is sometimes considered good”.

The college administrators generally agreed that promiscuity was rife in colleges. One dean of students explained that it would be very difficult to try and control sexual behaviour of adults. He pointed out that despite clear rules prohibiting students from sleeping in opposite gender’s hostels, some students break the rule and spend nights there. He argued that most students enter colleges when they are already sexually experienced (some are married with children) while others enter into sexual relationships with college tutors. The fact that colleges are of mixed gender was a great challenge itself.

4.6.3 Factors motivating risky sexual behaviours

Identifying factors that drive young adults to engage in risky sexual behaviours can help devise strategies for bridging the gap between transfer of HIV and AIDS knowledge to practice. Therefore, it was important to determine the main reasons why students in PTTCs engaged in risky sexual behaviour. Table 4.13 presents a profile of the reasons as provided by the students.

Table 4.13**Reasons motivating risky behaviour among students**

Reason	Gender		Total (%)
	Male (%)	Female (%)	
Away from partner	82 (18.87)	92 (17.70)	174 (17.90)
Peer influence	118 (26.00)	135 (26.10)	253 (26.00)
For money	215 (47.40)	255 (49.20)	470 (48.10)
Not satisfied in sex	21 (4.60)	10 (1.90)	31 (3.20)
Curiosity	9 (2.00)	15 (2.90)	24 (2.50)
Lust	8 (1.70)	9 (1.80)	17 (1.90)

n = 1010

Table 4.13 presents results which indicate that money was the main reason cited by both males (47.40%) and female (49.00%) as to why students engaged in risky sexual behaviour. Both gender cited peer pressure (26.00%) as the second main reason. Findings from the FGDs conducted in this study also revealed that money, peer influence and curiosity were major drivers to engaging in sex. One female discussant explained that money “means a lot to students and girls can do anything to have it.” Another female put it more vividly thus:

“...Students need money and rich men want to make love to them the way they never do to their spouses. The men do anything that they want to do with the girl and pay the money and go. They want hard sex. They penetrate into you without caring and have no time to put on a condom. Somebody may feel the pain but the

person wants the money. We students love money; once we see money, we go for it.”

The argument corroborates Abdullahi and Abdullahi (2013) findings that majority (69%) of Maiduguri University students engaged in premarital sex for economic reasons. Biddlecom et al., (2008) and Madise et al., (2007) found strong links between poverty and pre-marital sex especially among girls. Girls from poor backgrounds were tempted to exchange sex for financial rewards from old and young rich men. Peers are usually a source of information including sex information. Ramesh (2004) found peer pressure to have positive effect on prevalence of pre-marital sex. Ibrahim (2004) also posited that due to peer pressure some students fall into promiscuous behaviour without realising the extent they had indulged.

4.7 Perceived risk to HIV infection and HIV prevention strategies

In order for young people to adopt a HIV prevention strategy, they first have to think they are at risk of becoming infected with the virus. Accurate assessment of one's own risk to HIV infection is important to adoption of safe sex practices (Ndola et al., 2006). In addition, personal experience and familiarity with HIV and AIDS is associated with more awareness and higher perceived risk of HIV infection. In this study, three items were used to measure the students' personal perceptions to chances of acquiring the virus. The analysis is presented in Table 4.14 and Figure 4.5.

Table 4.14**Perceived risk to HIV by gender**

Variable	Gender		Total (%)	
	Male (%)	Female (%)		
Know HIV ⁺ person*	Yes	125 (27.50)	186 (36.50)	311 (32.30)
	No	329 (72.50)	324 (63.50)	653 (67.70)
Chance boy/girlfriend get virus**	Yes	249 (53.30)	251 (50.90)	500 (53.00)
	No	201 (44.40)	242 (49.10)	443 (47.0)

* n= 964 ** n=943

In the study, it was found that 32.30 percent of the students reported knowing someone infected by the virus or who had died of AIDS related diseases. Slightly over a half thought that their boyfriend/girlfriend/spouse was likely to get HIV infection. This showed that a substantive number of students had first-hand experience with HIV and AIDS pandemic. Knowing someone with HIV or AIDS is important in realising that we are all vulnerability to the disease. The findings concur with what Pettifor et al, (2004) found among South African young adults; 26 percent of 15–24 year olds knew someone living with HIV and 45 percent knew someone who had died of AIDS. Kermyt, Beutel, and Maughan-Brown, (2007) reported lower percentages in the same country; 17 percent males and 20 percent female students reported having known someone with AIDS or who had died of AIDS. Figure 4.5 shows the personal assessed risks of the students to the pandemic.

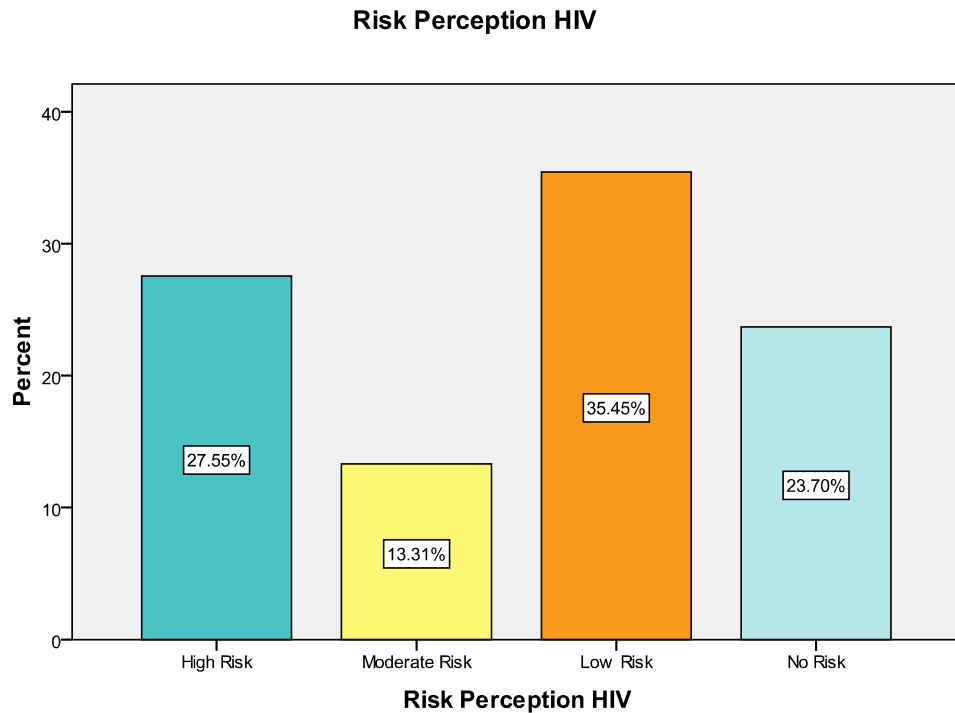


Figure 4.5: Students self-assessed risk perception to HIV infection

Perception of risk was generally poor with 35.45 and 23.70 percent of students perceiving themselves at low risk and no risk respectively. This is despite the prevalence of risky sexual behaviours among students as indicated in table 4.10. The results support arguments advanced that young people think they are invincible (Adedeyi et al., 2009). In line with this, many studies have established poor risk assessment among young adults between 15 – 24 years (Adedeyi, 2011; Akwara et al., 2003; Inungu et al., 2008; Madeline et .al., 2011; Menser, 2010; Ward et al., 2004; and Sutton et al. (2011).

Despite the poor perceptions on risk to HIV, most discussants acknowledged that HIV and AIDS is a deadly disease. The disease was labelled a ‘silent killer’. Students stated that it would be difficult to identify HIV positive people especially

if they were on ARVs for they look healthy. Such people if 'bitter with the world' can spread the virus to many unsuspecting people. A few discussants said they had seen a person die from AIDS. This was mostly a neighbour and not a relative.

4.8 Discussion of findings from inferential statistical analysis

Chi-square statistical test of independence was used to test all the hypotheses. The test was found suitable because it can be used with nominal, ordinal or scale variables and does not require assumptions about shape of the underlying distributions; so it is very versatile. The chi-square data were obtained from cross-tabulation analysis and .05 level of confidence was used to accept or reject each null hypothesis. Strength of association (effect size) was measured using Cramer's V coefficients and interpreted using the set of descriptors proposed by Rea and Parker (1992) as:

- .00 and under .10: negligible association;
- .10 and under .20: weak association;
- .20 and under .40: moderate association;
- .40 and under .60: relatively strong association;
- .60 and under .80: strong association; and
- .80 and under 1.00: very strong association.

In addition, multiple regression analysis was performed to measure contribution of each determinant to adopted HIV and AIDS prevention strategies. The findings of the tested hypotheses are discussed in the following sub-sections.

4.6.1 H0₁ There is no significant relationship between social-demographic characteristics of the students and adopted HIV and AIDS prevention strategies

In the analysis, two aspects of prevention strategies were implied; effective strategies and less effective strategies. Five independent variables were used in cross-tabulation; gender, age, marital status, religion and place of residence during holidays. Chi-square test of association to examine the relationship of each variable and adopted HIV and AIDS prevention strategy was performed. Strength of association (effect size) was measured using Cramer’s V coefficients and interpreted using the set of descriptors proposed by Rea and Parker (1992). A summary of the analysis on the variables is presented in Table 4.15.

Table 4.15

Summary of chi-square test on social-demographic variables and effective HIV and AIDS prevention strategies

Variable	Chi – square test			Cramer’s V
	Chi square value	df	Asymp. sig.	
Gender	7.26	1	0.007	0.085
Age	0.72	2	0.699	0.027
Marital status	5.02	2	0.081	0.070
Religion	16.65	3	0.001	0.130
Place of residence	1.53	2	0.466	0.039

Chi-square tests of association revealed no significant relationship between marital status, place of residence during holidays and age and adopted HIV and AIDS prevention strategies. The null hypothesis on the three variables was accepted. However, gender and adopted prevention strategies were highly significantly related; $\chi^2 (1, N=1010) = 7.26, p = 0.007$. Equally, religion and adopted HIV prevention strategies was very highly significantly associated; $\chi^2 (3, N=1010) = 16.65, p = 0.001$. When the strength of association was measured, using Cramer's V coefficient, all the variables had negligible influence on adopted HIV and AIDS prevention strategies with the exception of religion (13.0%) that had a weak effect. From the observations, it seems only religion had slight influence on a student's decision to adopt effective HIV and AIDS prevention strategies.

The significant findings in this study agree with what most researchers have found on religion and prevention strategies. Famuyiwa and Torimorol (n.d); Messina (1994); Mulugeta and Berhene (2014); and Trinitapoli and Regnerus (2004) all found strong association between religion and reduction in risk behaviours and use of HIV prevention strategies. Religion is said to provide guidance on acceptable moral behaviour.

Although the strength of association between gender and adopted HIV strategies was negligible, the relationship as provided by the p – value was highly significant. The significant results on the variable gender are in line with many studies that have revealed significant gender differences in the uptake of HIV and AIDS prevention strategies. Setsuko et al. (2007) and Wetti et al (2011) found significant differences in condom use with a bias towards males while Adedeyi et

al. (2009); Chandra et al. (2011); and Mistra et al (2009 found significant gender differences with regard to abstinence and fidelity. Magu et al. (2012) also found significant relationship between gender and condom use among students in universities in Kenya ($p < 0.001$) in both male and female.

The non-significant results were inconsistent with what most studies have established over time. HIV infection has been higher among the married than in the unmarried (Kenya AIDS epidemic UPDATE, 2012; Stephenson, 2008; UNAIDS/World Bank, 2008). This implies that married people are not practicing fidelity as expected and the promiscuous ones are not using condom as a protection. Studies have also established area of residence as an independent predictor of HIV seroconversion. Hall et al. (2010); Long et al. (2006); Mnyika et al. (1994) and Solomon et al. (1998) all found their study groups in urban areas to significantly differ in seropositivity from rural populations. The urban population was more likely to be infected; an indication of low HIV prevention strategies uptake. The non-significant results in this study could be as a result of the little variance in the sample in terms of age (93.2 % were within below 19 – 24 years age range); marital status (80.7 % were single) and area of residence (63.4 % resided in rural areas).

4.6.2 HO₂ There is no significant relationship between students' knowledge levels on HIV and adopted HIV and AIDS prevention strategies

A chi-square test of independence examined the relationship between students' knowledge levels of HIV and AIDS (prevention strategies; abstinence, use of condom, testing for HIV etc and transmission modes; vaginal sex, blood transfusion, kissing etc).The knowledge levels were categorised as; good,

moderate and poor and adopted HIV and AIDS prevention strategies were grouped as; effective and less effective. The relationship between these variables was found to be highly statistically significant; $\chi^2 (2, N = 987) = 17.83, p = 0.001, V = .134$ but with a weak influence; the independent variable accounted for only 13.4 percent variance in the dependent variable.

Findings indicated that a student's knowledge level was important in adopting HIV prevention strategies. That is, a student with high knowledge level was more likely to adopt an effective HIV prevention strategy than a student with poor knowledge level. The weak association meant that knowledge levels were of little practical significance in influencing students in their choice and use of effective HIV and AIDS prevention strategies.

Although a statistically significant relationship was found between knowledge about HIV and adopted HIV prevention strategies, the weak influence between the variables supports the position of researchers who posit that despite high knowledge about the devastating effect of HIV and AIDS, people are often reluctant to adopt available preventive strategies. Studies conducted among students in tertiary institutions by Anyagu et al. (2008); Inungu et al. (2008); Lindsey et al (2012); Milkowski and Slanger, (2005) and Sarkar et al. (2005) demonstrated that high knowledge levels had not translated to significant behaviour changes in young adults. Ojikutu et al. (2010) also concluded that students' knowledge about HIV and AIDS was not significantly associated with the method used in preventing the disease; ($\chi^2 = 4.177, p > 0.05$).

4.6.3 HO₃ There is no significant relationship between students' sexual behaviours and adopted HIV and AIDS prevention strategies

Chi-square test of association revealed that there was no statistical significant relationship between students' sexual behaviours and adopted HIV and AIDS prevention strategies; $\chi^2 (1, N = 865) = 2.61, p = 0.106, V = 0.055$. The null hypothesis was accepted. Students' adopted HIV prevention strategies were not influenced by their sexual behaviours. This was further confirmed by the negligible influence of the independent variable on the dependent variable as demonstrated by the low effect size; the independent variables accounted for only 5.5 percent of the variance in the dependent variable. Students' who engaged in risky sexual behaviours were not likely to adopt effective HIV prevention strategies.

These findings are in line with Baumgartner et al. (2009); Stoneburner and Bear (2004); Wouhabe (2007); Michelle and Adesegun (2009); and (Uchenna, 2008) who posit that early sex debut correlates with increased number of lifetime sexual partners, lowered intentions to use condoms in subsequent relationships and increased likelihood of getting infected with the AIDS virus. Other researchers like Exavery et al. (2011); Maswanga (1999); and Yanga et al (2012) reported no association between multiple sex partners and condom use. Young adults who had multiple partners either did not use condoms or were using them inconsistently.

4.6.4 HO4 There is no significant relationship between students' perception to risk of HIV and adopted HIV and AIDS prevention strategies

To determine if there was a significant relationship between perception to the risk of HIV (no risk, low risk, moderate risk and high risk) and adopted HIV prevention strategies (effective, less effective) among students in PTTCs, a chi-square test of independence was performed. The relationship between these variables was not significant; $\chi^2(3, N = 962) = 6.58, p = 0.09$. Students' adopted preventive strategy was not dependent on the extent to which he or she perceived himself or herself to be at risk of contracting HIV infection. Cramer V coefficient ($V = 0.083$) indicated negligible association between the perceptions to HIV risk and adopted strategies. This meant that even students who perceived themselves to be at high risk of contracting HIV infection were not likely to adopt an effective prevention strategy. Therefore, the null hypothesis was accepted.

The findings indicate no agreement between the self-reported perceptions to HIV risk and HIV prevention strategies. Students in this study tended to underestimate their personal risk (59.1% rated themselves at low or at no risk). This may mean students are not ready to adopt HIV and AIDS prevention strategies. The findings agree with those of Ward et al. (2004) who found rising HIV cases among college students and low perceived risk to HIV infection. Madeline et al. (2011) made similar observations; students who had multiple sexual partners perceived themselves at low risk and were not using condoms. Likewise, majority of students in US colleges did not perceive themselves at risk of HIV infection despite the high prevalence of risky sexual behaviours in the colleges (Inungu et al., 2008).

4.6.5 HO₅ Social demographic variables, knowledge levels of HIV, sexual behavioural factors and perception to HIV risk do not contribute significantly to adopted HIV and AIDS prevention strategies

Multiple regression analysis was performed to assess which predictor variables greatly contributed to adoption of effective HIV and AIDS prevention strategies. Data were presented in a model summary to show strength of correlation and percentage variability in the dependent variable as accounted for by all the independent variables. Tables 4.16, 4.17, and 4.18 present this data.

Table 4.16

Model summary

Model	R	R Square	Adjusted R Square	Std.Error of the Estimate
1	.190 ^a	.036	.023	.49462

a. Predictors: (Constant), Sexual Behaviour, Residence, Perceived Risk, Knowledge, Religion, Age, Gender, Marital status.

The model summary shows a positive relationship; R= 0.19, between the predictor variables and adopted HIV prevention strategies. The combined linear effects of the predictor variables explained 36 percent variance in the adopted HIV prevention strategies. This implied that students' adoption of an effective HIV and AIDS prevention strategy was moderately predicted by the eight determinants.

Table 4.17

ANOVA

		Sum of				
Model		Squares	df	Mean Square	F	Sig.
1	Regression	5.245	8	.656	2.680	.007 ^a
	Residual	139.693	571	.245		
	Total	144.938	579			

a. Predictors: (Constant), Sexual Behaviour, Residence, Perceived Risk, Knowledge, Religion, Age, Gender, Marital status.

Table 4.16 shows the test of significance of the model using ANOVA. There are a total of 579 (N-1) degrees of freedom. With 8 predictor variables, the regression effect has 8 degrees of freedom. The regression effect was statistically significant; $F(8,571) = 2.68$, $p = 0.007$). This indicated that the dependent variable was not by mere chance.

Table 4.18**Summary model on regression analysis**

Model		Unstandardized Coefficients		Beta	Standardized Coefficients	
		B	Std. Error		t	Sig.
1	(Constant)	1.919	.163		11.770	.000
	Gender	-.102	.043	-.102	-2.378	.018
	Age	.049	.036	.062	1.359	.175
	Marital status	-.042	.058	-.035	-.734	.463
	Religion	-.024	.032	-.032	-.753	.452
	Residence	.006	.026	.010	.228	.819
	Knowledge	-.089	.039	-.093	-2.253	.025
	Perceived Risk	-.085	.043	-.082	-1.973	.049
	Sexual Behaviour	.076	.055	.059	1.390	.165

a. Dependent Variable: Prevention strategies

Multiple regression analysis was used to measure the determinants that significantly contributed to participants' adoption of an effective HIV and AIDS prevention strategies. As observed in Tables 4.15 and 4.16 approximately 36 percent of the variance in the prevention strategies could be accounted for by all the independent variables together and all the entered predictors were significantly related to adopted HIV and AIDS prevention strategies; $F(8, 571) = 2.68, p = 0.007$). However, Table 4.17 that provides the model parameters indicated that gender ($\beta = -.102, p = .018$), knowledge ($\beta = -.093, p = .025$) and perceived risk ($\beta = -.082, p = .049$) had significant negative contribution in that declining order of magnitude. This indicated that one standard deviation in increase in knowledge level led to a .093 standard deviation decrease in adoption of a less effective HIV prevention strategy. The t - test further confirmed the

'importance' of the three predictors: gender, $t(139.67) = -2.38, p = .018$; knowledge, $t(139.67) = -2.25, p = .025$; and perceived risk, $t(139.67) = -1.97, p = .049$ (the smaller the value of the significance and the larger the value of t -statistic, the greater the contribution of that predictor). From the magnitude of the standardized beta values and the t -statistics, gender had slightly more impact than the other two predictors. As observed, most of the determinants had little deterministic influence on students' adoption of HIV and AIDS prevention strategies.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter summarises the national context of HIV prevention strategies in public primary teacher training colleges, methodology of the study, and the main findings. In addition, the chapter presents conclusions in response to the null hypotheses that were tested. Finally, recommendations for the present and future research are provided based upon the findings.

5.2 Summary of the study

The purpose of the study was to investigate determinants of adoption of HIV and AIDS prevention strategies among students in PTTCs. One research question dealt with HIV and AIDS prevention strategies adopted by students in PTTCs. Four null hypotheses tested the relationship between social–demographic characteristics such as; (a) gender (b) age (c) marital status (d) religion and (e) place of residence; knowledge levels of HIV sources of information, prevention methods and transmission modes; sexual behaviours; perceived risk to HIV infection; and the relative contribution of the said variables to HIV and AIDS prevention strategies adopted by students in PTTCs.

Literature related to the study variables is thematically presented in chapter two of the study. The findings emanating from the reviewed literature provided conceptual and theoretical frameworks and directions for investigating the study. Both qualitative and quantitative research paradigms were employed in the conduct of the study. Specifically, a cross-sectional descriptive correlation survey design was used to gain a holistic understanding on the relationship between the

independent and dependent variables. Ethical measures for the use of human respondents were assumed by voluntary consent to participate in the study by the respondents.

The PTTCs provided the profiles of the study participants; 13 principals, 13 deans of students and 1040 students. Stratified random sampling and purposive sampling methods were utilised to select the study participants. Data were collected using anonymous semi-structured questionnaires, individual face to face interviews guides and focus group discussion guides. Focus groups were found to be effective in enabling spontaneous discussions in which the discussants expressed their views, opinions, experiences and feelings on HIV and AIDS related issues. The semi-structured individual interviews were conducted with each principal and dean who freely provided their personal opinions and perspectives on students' sexual behaviours on the face of HIV and AIDS.

Data collected were analysed using descriptive statistics; percentages, frequencies, means and standard deviations; and inferential statistical; chi square and multiple regression analysis. The statistical significance was tested at alpha 0.05. The data analysis process comprised of an initial general description of the data followed by a more comprehensive analysis in which research hypothesis were tested. A detailed discussion and description of the components of this framework are presented in chapter four but a summary of the major findings is presented in this section.

In the study, it was found that only a limited number of students had fully embraced effective HIV and AIDS prevention strategies; consistent correct condom use (52.38%), remaining faithful to one uninfected faithful partner

(34.95%) and abstinence (20.59). Overall, younger students were more likely to use effective HIV and AIDS prevention strategies than older students. The below 19 years (25.9%) were more likely to abstain from sex and practice fidelity (34.47%) than the older students in the age range of 25 years and above. There were important gender differences in adoption of the strategies. Very few male students practiced abstinence (16.49%) but condom use was high (56.66%). Chi-square analysis revealed that gender ($p = 0.007$) and religion ($p = 0.001$) were significantly related to adopted HIV prevention strategies. However, gender had a weaker influence ($V = 0.085$) compared to religion ($V = 13.0$).

Students identified radio, television and teachers as their most important sources of HIV and AIDS information. Findings on knowledge of HIV and AIDS transmission indicated that most students had about adequate knowledge. Students scored better on items on transmission ($M = 9.83$, $SD = 1.33$) than on prevention ($M = 9.72$, $SD = 1.70$). A low percentage of students (31.70) had comprehensive correct knowledge. Saliva (46.34%), kissing (51.80%) and attending worship places and praying regularly (33.66%) were incorrectly identified as routes of HIV transmission. There were no substantial variations in knowledge by gender. In this study, knowledge levels were associated with HIV and AIDS prevention strategies adopted by the students ($p = 0.001$). However, the association was weak ($V = 13.4$).

Only 20.59 percent of the college students were abstinent despite majority reporting that they were single (80.70%). Among the sexually experienced, 33.24 percent of males and 5.52 percent of females had initiated sex at an age less than or equal to 14 years. However, being sexually active was not found to be an

indicator of having sex regularly. A good number of students had not had sex (male = 46.8%; females = 33.0%) within the last three months prior to the study. Thus they were practising secondary abstinence. When data were summarized by age, the over 27 years olds (52.79%) were found to be the most sexually active. Students' profile on sexual characteristics that place them at risk of infection showed that over time, about two in three students had had two or more sexual partners with more males (66.41%) than females (54.99%) likely to report multiple partners. A decrease in risky sexual practices was noted. At the time of the study, 70.65 percent of male students and 85.60 percent of female students (overall = 78.05%) had only one partner. A very low percentage (3.49%) had had sex with commercial sex workers. Inferential analysis showed that sexual behaviours were not significantly related to students' adopted HIV and AIDS prevention strategies, ($p = 0.106$).

Analysis on risk perceptions among students revealed that many students (59.00%) perceived themselves at low or no risk but acknowledged that their partners (53.00%) and not them were at risk of contracting the AIDS virus. The poor perceptions were despite the established risky sexual behaviours prevalent in colleges and the acknowledgement that students (32.20%) knew someone with HIV and AIDS or a person who had died of AIDS related diseases. Chi-square analysis showed no significant relationship between perceived risk to HIV, ($p = 0.09$) and the adopted preventive strategies. A student's self- assessed HIV risk level did not influence him or her to adopting a prevention strategy. The strength of association between the two variables was insignificant.

Multiple regression model revealed that only three variables had moderate influence on the HIV and AIDS prevention strategies adopted by the students. Gender ($\beta = -.102$, $p = .018$), knowledge ($\beta = -.093$, $p = .025$) and perceived risk ($\beta = -.082$, $p = .049$). The higher the knowledge level of a student, the more likely he or she was to use a less effective strategy. Students who perceived themselves at no risk of HIV infection were unlikely to adopt a HIV prevention strategy. On the same breadth, being (female = 0) increased the chances of adopting a less effective strategy. From the magnitude of the standardized beta values and the t-statistics, gender had slightly more influence than the other two predictor variables.

5.3 Conclusions of the study

Several determinants that influence adoption of HIV and AIDS prevention strategies among college students have been explored; most of them pointing to the existing gaps between transfer of theory into practice that is manifested in students' risky sexual behaviours and the low uptake of HIV and AIDS prevention strategies.

Of the selected socio-demographic variables, gender and religion were important in adoption of HIV prevention strategies. The findings also point at important variations in terms of age and gender in response to HIV prevention strategies. Therefore, college students cannot be considered a homogenous population for which one type of intervention will be effective.

The high HIV and AIDS knowledge level among students has not been translated into safer sexual behaviours that scale down the spread of HIV infection. This gap is worrying because HIV prevalence is still high in this age

group. There are also important gender differences in knowledge levels that HIV and AIDS curriculum need to address. The reviewed literature and findings from this study depict women to possess lower knowledge levels about HIV and AIDS and both gender still hold misconceptions on HIV transmission. It was concluded that availability and accessibility of HIV authentic knowledge was necessary but not sufficient in itself to make students adopt HIV prevention strategies.

No evidence of association was found between sexual behaviours and adoption of HIV and AIDS prevention strategies yet a substantial number of college students in the study engaged in risky sexual behaviors. In addition, students had a poor appreciation of their risk of HIV infection and majority had not adopted the effective HIV prevention strategies. It was then concluded that students lacked experience in assessing influence of their risk taking behaviour and perceptions to HIV risk. There is, therefore, a risk of students not taking any HIV prevention strategy even in future due to the poor perceptions of their vulnerability.

On the whole, some social-demographic characteristics (age, marital status and area of residence), knowledge, sexual behaviours and risk perceptions had moderate influence on adoption of effective HIV and AIDS prevention strategies.

5.4 Recommendations of the study

The findings of this study suggest important directions for future HIV and AIDS interventions and on students' health research and practice. The study recommendations are in three sets. The first two sets relates to practices that can improve the uptake of effective HIV and AIDS prevention strategies among college students through practical actions or policy interventions. The second set provides information on the areas that may require further research.

5.4.1 Recommendations for practice

1) Curriculum designers should design differentiated HIV interventions for the heterogeneous student population to address strategies for HIV prevention. The interventions should emphasise on correct assessment of risk to HIV in order to increase students' uptake of HIV and AIDS strategies. There are important differences among the students in terms of gender and age that call for this. HIV and AIDS education and prevention programmes in colleges should, therefore, consider more carefully how gender and religion may intersect to influence adoption of HIV prevention strategies among students.

2) The college tutors should ensure that they provide reliable, unambiguous and scientifically accurate information about HIV and AIDS to help clear misconceptions held by the students and to raise knowledge and awareness levels among them. The tutors should deal with specific HIV and AIDS issues instead of presenting general information.

3) The college administration should encourage safe sexual behaviours and lifestyles within the college environment. This can be done by providing support to HIV interventions, getting involved in them and providing release time to tutors and students to attend HIV – related workshops and seminars. This will generally increase tutors and students capacity in dealing with HIV and AIDS challenges at personal and social level.

4) All colleges should institute peer educators programmes. The peer educators should be continuously developed to keep abreast with developments in matters concerning youth and HIV and AIDS. In turn, they will keep their compatriots on top-of things.

5) Religious leaders should promote religious values including purity and faithfulness among the youth who attend services. This can be done through youth recreation programmes.

5.4.2 Recommendations for policy

1) The Ministry of Education should consider making life skills education that largely carries HIV education an examinable subject. By implication, students will learn more on HIV and there is a high possibility of transferring the learnt knowledge and skills into practice.

2) The government and non-governmental organisations should support colleges in implementing the HIV policies and practices aimed at reducing risky sexual behaviours among the youth. Specifically, the government through the Ministry of Education can support educational media programmes for youth in tertiary institutions where they can voice their challenges with HIV and AIDS.

3) Most young adults receive HIV information from media and other electronic sources. Therefore, the government and groups that advocate for prevention of HIV among the youth should insist on the media, more so the entertainment industry, to produce programmes that contain responsible sexual content including HIV messages. This can be achieved through holding seminars for writers, producers, and film directors in cooperation with other groups. Similarly, advertisers can be discouraged from using sex to sell products. Educational seminars might help to achieve this goal.

4) The Ministry of Education should develop a system to monitor and evaluate the effectiveness of college-based HIV and AIDS education and its technical and

behavioural outcomes and impact. In addition, a surveillance system to track HIV prevalence among college students and the college staff can be developed.

5.4.3 Recommendations for further studies

Taking limitations and delimitations of the current study into consideration, the following areas may be researched on to illuminate more on adoption of effective HIV and AIDS prevention strategies among young adults in colleges.

1. The scope of the current study can be scaled up to include students in universities and other middle-level colleges to consolidate the much needed evidence on determinants that influence students to adopt HIV protection. Such a study can be longitudinal in design to establish causal effects in order to cross-validate findings in the current study.
2. Future research on college students in the Kenyan context can focus on other variables related to adoption of HIV prevention strategies and not addressed in this study. Such variables may include and not limited to; structural factors, college environment, location of the college, students' home-background factors and alcohol, substance and drug abuse.
3. A study to scrutinize how HIV and AIDS education is delivered in colleges would be necessary. This will bring out the gaps that exist in translating HIV knowledge into practice.
4. A study may be conducted to evaluate the effectiveness of pre-service HIV and AIDS curriculum in preparing teacher-trainees to deliver the HIV and AIDS content that leads to behavioural change.
5. A study to investigate factors that make women score low in HIV knowledge may be necessary.

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APPENDICES

APPENDIX 1 TRANSMITTAL LETTER

University of Nairobi
P.O .Box 30197 – 00100
Nairobi.

To:

The Principal,
_____ Teacher Training College,
P.O Box _____

Dear Sir / Madam,

RE: DATA COLLECTION FROM YOUR COLLEGE

I write to request for permission to collect data from your college. The study focus is on **“Determinants of adoption of HIV and AIDS prevention strategies among students in PTTCs”**. The information gathered is for academic purpose **ONLY** and will yield only statistical data. Identities of participants will remain confidential. It is hoped that study results will be important to educational practitioners and policy makers in devising innovative ways to curb the spread of AIDS virus.

Attached please find copies of study authorization from the Ministry of Education and a letter introducing the research assistants.

Thanking you in anticipation.

Yours faithfully,

LUCY NJAGI – P.HD STUDENT

APPENDIX II

INTRODUCTION OF RESEARCH ASSISTANTS

University of Nairobi

P.O. Box 30197 – 00100

Nairobi.

To:

The Principal,

_____ Teacher Training College,

P.O. Box _____

Kenya.

Dear Sir / Madam,

RE: INTRODUCTION OF RESEARCH ASSISTANTS

The bearers of this letter are members of a research assistant team conducting a study in PTTCs countrywide. I would be glad for any assistance accorded to them by your college to facilitate in gathering of data. As a way of identification, they have copies of research permit from the Ministry of Education.

Thanking you in anticipation.

Yours faithfully,

LUCY NJAGI – PhD STUDENT

APPENDIX III

STUDENTS' QUESTIONNAIRE

INSTRUCTIONS

This questionnaire seeks information from you about factors that influence adoption of HIV and AIDS prevention strategies among students in PTTCs. Your careful, complete and honest responses will assist in collecting valid data. The information you give will be used for research purpose and any answers you give will not reflect on you as an individual neither as a college. Your individual identity will not be revealed.

The questionnaire has been designed to enable you answer the items quickly and easily. In answering this questionnaire, bear in mind that this is **NOT A TEST**; the only right answers to the questions are those that best explain your situation or express your views.

Please answer frankly. Where choices are given; tick the option that matches your answer or write a figure as instructed. Otherwise, write out the information asked for in the BLANK spaces after the question.

Section A: Social-demographic characteristics

1. What is your gender? Male Female

2. What is your age bracket in years? Please tick appropriately.

15 – 19 23 – 25 Over 25

3. What is your marital status?

Single [] Married [] Separated [] Divorced []

Other (Specify) _____

4. To which denomination or religion do you belong to?

(Please indicate) _____

5. Where do you stay during holidays?

Rural areas [] Semi-urban areas [] Urban areas []

6. How often do you attend church services?

Always [] Often [] Rarely [] Never []

Section B: Knowledge on HIV and AIDS and means of HIV protection

7. Below is a list of sources of HIV and AIDS related information. Using a scale of 1 to 10, rate the sources that have provided most information to you with 1 being the source that has offered greatest information and 10 the source that has provided least information to you.

Radio []

TV []

Newspapers []

Friends []

Parents []

Tutors []

Public posters []

Health personnel []

Politicians []

Religious []

8. The following are some of the HIV and AIDS transmission routes. Indicate whether HIV and AIDS can be transmitted through the following routes by ticking either TRUE or FALSE

	True	False
Unprotected vaginal sex	<input type="checkbox"/>	<input type="checkbox"/>
Using unsterilized needles	<input type="checkbox"/>	<input type="checkbox"/>
Shaking hands with HIV positive	<input type="checkbox"/>	<input type="checkbox"/>
Sharing utensils like plates, cups	<input type="checkbox"/>	<input type="checkbox"/>
Transfusion of untested blood	<input type="checkbox"/>	<input type="checkbox"/>
Sitting on public toilets	<input type="checkbox"/>	<input type="checkbox"/>
Unprotected anal sex	<input type="checkbox"/>	<input type="checkbox"/>
Saliva from people	<input type="checkbox"/>	<input type="checkbox"/>
Kissing people	<input type="checkbox"/>	<input type="checkbox"/>
Mosquito bites	<input type="checkbox"/>	<input type="checkbox"/>
Hugging	<input type="checkbox"/>	<input type="checkbox"/>
Sweat	<input type="checkbox"/>	<input type="checkbox"/>

9. The following are some of the HIV and AIDS prevention strategies. Indicate whether one can keep free from the AIDS virus by practicing one or more of the following (Tick either Yes or No).

	Yes	No
Maintaining one faithful sexual partner	<input type="checkbox"/>	<input type="checkbox"/>
Refusing to donate blood	<input type="checkbox"/>	<input type="checkbox"/>
Using sterilised needles	<input type="checkbox"/>	<input type="checkbox"/>
Not attending discotheque	<input type="checkbox"/>	<input type="checkbox"/>
Abstaining from sexual intercourse	<input type="checkbox"/>	<input type="checkbox"/>
Attending church regularly and praying	<input type="checkbox"/>	<input type="checkbox"/>
Using condoms correctly during sex	<input type="checkbox"/>	<input type="checkbox"/>
Reducing the number of sexual partners	<input type="checkbox"/>	<input type="checkbox"/>
Preventing pregnancy in infected mothers	<input type="checkbox"/>	<input type="checkbox"/>
Selecting sexual partners carefully	<input type="checkbox"/>	<input type="checkbox"/>
Testing to know HIV status	<input type="checkbox"/>	<input type="checkbox"/>
Taking drinks containing lemon	<input type="checkbox"/>	<input type="checkbox"/>

10. From the given list, tick the HIV and AIDS prevention strategy (methods) that you always use to prevent yourself from contracting HIV virus.(Can tick more than one).

- Test for HIV status
- Douching

Ask about sex history of a partner []

Remain faithful to one sexual partner []

Prompt treatment of STDs/STIs []

Used a male/female condom []

Abstain from sex []

Withdrawal []

Section C: Sexual behavioural factors

11. Do you currently have a regular sexual partner? ('Regular' means a spouse, boy or girlfriend).

Yes []

No []

12. Now think back. At what age did you have your first sexual experience? (Indicate age in years).

Years [] I am still a virgin []

13. When did you last have sexual intercourse?

Within the last one week []

Within the last one month []

Within the last three months []

More than three months ago []

Others (specify)_____

14. With whom did you have the last sex with?

Regular partner (spouse, boy/girlfriend) []

A casual sexual partner (not regular) []

A prostitute (paid for the services) []

Others (please specify)_____

15. Did you use a condom during the last sexual experience?

Yes []

No []

16. Have you had sexual intercourse in the last six months with anyone else?

(‘Else’ means not your regular sexual partner).

Yes []

No []

17. How many sexual partners do you currently have?

0-1 partner []

2-3 partners []

4 - 5 partners []

more than 5 partners []

I do not have one at present []

18. How many sexual partners have you ever had in your life?

0-1 partner [] 2-3 partners [] 4 or more partners [] None []

Section D: Perceived Risk

19. Do you know of a person who is infected with HIV or died of AIDS related illnesses?

Yes [] No []

20. Following the normal course of your life, what do you think are the chances that you might get infected with HIV virus?

No chance [] Low chance [] Moderate chance []

High chance [] Do not know []

21. a) Do you think chances are high for your friend to get HIV infection ?

Yes [] No []

b) Provide reason(s) for your response in 21(a).

22. Why do you think you are at risk/ not at risk (delete the one that does not apply to you) of contracting HIV virus?

THANK YOU FOR YOUR COOPERATION

APPENDIX IV

INTERVIEW GUIDE FOR DEANS' OF STUDENTS AND COLLEGE PRINCIPALS

COLLEGE CODE: _____

Introduction

This is a visit to familiarize with the ways college students in PTTCs prevent themselves from HIV infection. It is not an evaluation of you as a Principal or a Dean, your college or the students. I would like to get a realistic picture of the HIV and AIDS prevention strategies that students have adopted and what influences such options. I have a number of specific questions that I would like us to discuss.

Section A: Background Information

1. Gender: _____

2. Age bracket

25 – 30 [] 31 – 35 [] 36 – 40 []

41 – 45 [] Over 50 []

3. Position held

Principal [] Acting Principal []

Dean [] Acting Dean []

4. How long have you been working in your present position? _____ years

5. For how long have you been in this college? _____ years

Section B: Students' sexual behavior

6. Generally speaking what would you say about the sexual behaviours of the students in your college?

- Probe on promiscuity.
- Probe on cases of cohabitation in college hostels.
- Cases of pregnancies.
- Probe on records of students suffering from STIs, HIV or any deaths that could be linked to AIDS.

Section C: Administrative support in preventing spread of HIV

7. Does the college administration support students in their efforts to prevent HIV infection?

- Probe on availability of condoms within the reach of students e.g. Condom dispensers in the washrooms.
- College rules concerning residential/l hostel areas.
- Availability of appropriate HIV and AIDS prevention messages e.g. invitation of counselors, HIV and AIDS victims, health personnel's etc to lecture to students; materials on HIV and AIDS.
- Clubs e.g. HIV and AIDS clubs.
- Visibility of HIV and AIDS messages such as posters in college, classrooms etc.

8. Does the college administration encounter challenge in trying to assist students modify their sexual behaviour?

- Probe on whether the challenges are due to age of students; marital status; ethnicity, religion etc.

9. What other factors are important in changing the sexual behaviour of the students?

- Probe on cultural, socio-economic, personal factors.

THANK YOU FOR YOUR TIME

APPENDIX V

FOCUS GROUP DISCUSSION GUIDE WITH STUDENTS (1hr)

A. During the introduction (5 min)

What should the moderator do?

Give the introduction; greet the participants, give purpose of the discussion and agree on the ground rules. For instance, "Good morning, my name is _____ and I will be facilitating our discussion. With me is _____ who will assist in steering the discussion. Today, we are here to discuss why despite the corpus knowledge available on HIV and AIDS young people continue to be afflicted by the deadly virus. We would like to explore determinants that hinder or facilitate adoption of prevention strategies among young people. Let me thank you for availing yourselves. Your comments during the discussion; both positive and negative will be very important. Remember there are no right or wrong answers. What is important is that I hear you talk. So speak up even if your thoughts, ideas or opinions differ with those of other participants."

What the moderator should say about the procedure

"My colleague will take short notes as we discuss. The notes will be used later to write a summary of our discussion. However, the report will not identify any one of you by name. This is an informal discussion and, therefore, do not wait to be called upon to contribute to the discussion. Feel free to talk. Please, speak in turns so that the researcher can jot down the important points. Since we have many topics to discuss, in only one hour, I may change the topic to move ahead. I will try to come back to the topic at the end of our session if we have time."

What should the moderator say about self-introduction?

"Let's do a quick round of introductions. Please tell us your name, marital status, and number of children if any. You can also tell us the region where you come from."

B. Starting with the discussion

What should the Research Assistant do?

- ✓ Take notes on what is being said.
- ✓ Take notes on what she/he can observe.

What should the moderator do?

Pose the 1st question (10 min)

“What do you understand by the term safe sex?”

- ✓ Probe for prevention strategies known to the students.
- ✓ Probe whether they practice any of the strategies which they mention.
- ✓ Probe on what hinder students from adopting certain strategies and why they prefer others.

Pose the 2nd question (10 min)

“Do friends share/exchange their sexual partners in college?”

- ✓ Probe for other sexual practices e.g. use of sex toys, sharing of phonographic material, swapping sexual partners.
- ✓ Probe on sexual health e.g. disinfecting the sex toys as they share them; use of preventive measures when they share partners etc.
- ✓ Probe on knowledge of risks involved due to such practices

Pose the 3th question (10min)

“Do college students practice casual sex?”

- ✓ Probe whether students practice prostitution/commercial sex and reasons that drive them to this.
- ✓ Probe on average number of sexual partners and rate of changing sexual partners.
- ✓ Probe on circumstances that encourage casual sex e.g. partying, discos, etc.

Pose the 4th question (10min)

“Does the college environment discourage promiscuity?”

- ✓ Probe for rules and regulations regarding residential areas.
- ✓ Probe for college life-style.

Pose the 5th question (10min)

“Do you know of a student in your college who is infected or has died of HIV and AIDS related illnesses?”

- ✓ Probe on knowledge on AIDS-related illnesses.
- ✓ Probe on whether students stigmatize such students.
- ✓ Probe on whether such sick students encourage them to change to positive sexual behaviour.
- ✓ Probe on the students’ perceptions to HIV and AIDS. For example, do they consider themselves to be at risk of contracting HIV infection.

C. During the discussion

The moderator should:

- ✓ Steer the discussion.
- ✓ Ensure the discussants are on the topic.
- ✓ Keep time.

D. Ending the discussion (5 min)

What the moderator should say:

“This is the end of our discussion. Do you have any questions? On behalf of my colleague I would like to thank each one of you for participating in the discussion. Your input is extremely valuable. Have a nice time.”

What the research assistant should do.

- ✓ Pack any items they could have carried along and be ready to leave.

APPENDIX VI
TRAINING GUIDE FOR RESEARCH ASSISTANTS

PREPARATION FOR COLLEGE VISIT

A. College to visit

The colleges where the main survey will be conducted will have been informed in advance about your intended visit. Please ensure that you are sure of the following regarding each college you are going to visit:

- Date and the time at which you must go to the college,
- Location of the college and how to get there; and
- Letter from the Ministry authorizing the study.

B. Data collection materials for each college

For each college to be visited, you should have received the following:

- 90 students' questionnaires
- A maximum of 4 interview guides for college Principals/ Dean of Students
- A maximum of 2 Focus Group Discussion Guides for students
- 2 notebooks (for use during FGD; interviews)
- 2 ball points
- A soft HB pencil, sharpener, eraser
- 1 wrist- watch (your own).

C. Check the instruments

Ensure that you have with you all the aforementioned materials. It is essential that there are no missing pages in the questionnaire. Take each copy of the questionnaire and go through it checking that every page is printed and the order of pages is right. If a page is missing or is unreadable because of smudging, get a good one to replace it.

ON ARRIVAL AT THE COLLEGE

The college Principal will be informed of your intended visit in advance. However, due to some reason, this may not have been possible. If this is the case, explain the purpose of your visit and present the letter of authorization from the Ministry to the college Principal.

A. Give an overview

Explain to the college Principal (or whoever in charge that day) that no participant will be identified as part of the data collection. Inform the Principal of what you will require from the college.

- ✓ Two second year classes which the researchers will randomly select
- ✓ 40 students from each randomly selected class. If a class has more than 40 students, for example, 45, let the extra 5 fill out the questionnaire but mark the excess ones (they will not form part of the analysis).
- ✓ A separate room to conduct FGD with 8 students
- ✓ The college Principal to respond to the interview items
- ✓ The Dean of Students to respond to the interview items

B. Select classes and students to fill out questionnaires

- Obtain 2nd year class registers /lists check that you have the current 2nd year class registers /lists and NOT those of another year. Make sure that the registers/lists are up-to-date. Students who have left college completely should have been deleted from the register/list.
- From the lists/registers randomly select two classes that have a student population of 40.
- If there are more than 40 students in each class, select those with a number close to 40.
- In cases where all classes have a similar number of students, e.g. 40 or 45, use the simple random technique with replacement to select two classes.
- If there are classes with less than 40 students, the deficit can be made by randomly selecting students from another 2nd year class.

C. Select students to participate in FGD

After the students have filled out the questionnaires, randomly select 4 students (2 males; 2 females) from each class to participate in FGD. The total FGD participants for each college should be 8 students.

INTRODUCING STUDENTS TO THEIR TASKS

- Explain the purpose of the study. Also explain that the students' identities will remain confidential and that the study aims to obtain summary statistical information across all the colleges and not to obtain information about individuals. Insist on the students that filling in the questionnaires will provide valuable information about future needs for teacher training on HIV and AIDS.
- Explain that the questionnaire will cover a wide range of items including socio-demographic, behavioural, knowledge factors, perception etc. The student should 'tolerate' questions that sound personal and provide responses as honestly as possible.
- Emphasize that all the questionnaire items should be answered and no blanks should be left unless necessary (where the item does not relate to the person).
- Have each student complete his/her questionnaire independently. It is important that the students do not copy from each other or discuss any of the questionnaire items.
- After the students complete filling out the questionnaires collect all of them and remember to thank them for their cooperation.

NOTE: Check each page of the questionnaire as you pick them to ensure there is no missing data or inconsistencies. For example, if a student states she is a virgin, then the item on first sex debut should be blank.

Focus Group Discussion

The discussion should be conducted immediately after the filing out of questionnaires exercise. Details on how to carry out the discussion are contained in the FGD facilitator's guide.

Interviews


The principal researcher will conduct face-to-face interviews with the college Principal and the Dean of Students as students fill out the instruments.

APPENDIX VII

PUBLIC PRIMARY TEACHER TRAINING COLLEGES

Name	Region (Province)
1. Baringo Teachers Training College	Rift Valley
2. Mosoriot Teachers Training College	Rift Valley
3. Kericho Teachers Training College	Rift Valley
4. Tambach Teachers Training College	Rift Valley
5. Kamwenja Teachers Training College	Central
6. Kilimambogo Teachers Training College	Central
7. Murang'a Teachers Training College	Central
8. Thogoto Teachers Training College	Central
9. Egoji Teachers Training College	Eastern
10. Meru Teachers Training College	Eastern
11. St. Mark's Kigari Teachers Training College	Eastern
12. Machakos Teachers Training College	Eastern
13. Kitui Teachers Training College	Eastern
14. Shanzu Teachers Training College	Coast
15. Garrisa Teachers Training College	North Eastern
16. Bondo Teachers Training College	Nyanza
17. Asumbi Teachers Training College	Nyanza
18. Migori Teachers Training College	Nyanza
19. Kaimosi Teachers Training College	Western
20. Eregi Teachers Training College	Western

APPENDIX VIII
RESEARCH PERMIT

PAGE 2	PAGE 3
THIS IS TO CERTIFY THAT:	Research Permit No. <u>MOEST 13/001/36C 115</u>
Prof./Dr./Mr./Mrs./Miss <u>LUCY</u>	Date of issue <u>21.2.2006</u>
<u>WANGUI NJAGI</u>	Fee received <u>SHS,1000.00</u>
of (Address) <u>UNIVERSITY OF NAIROBI</u>	
<u>P.O. BOX 30197 NAIROBI</u>	
has been permitted to conduct research in _____	PERMANENT SECRETARY MINISTRY OF EDUCATION SCIENCE AND TECHNOLOGY <i>M.O. ONDIEKI</i>
<u>TEACHERS TRAINING COLLEGES</u> Location,	
<u>ALL</u> District,	
<u>ALL</u> Province,	
on the topic <u>FACTORS INFLUENCING ADOPTION</u>	FOR: <u>M.O. ONDIEKI</u> <i>Permanent Secretary</i> <i>Ministry of Education</i> <i>Science and Technology</i>
<u>OF PREVENTIVE STRATEGIES AGAINST HIV</u>	
<u>INFECTION BY STUDENT TEACHERS IN</u>	
<u>PRIMARY TEACHERS TRAINING COLLEGES</u>	
<u>IN KENYA</u>	
for a period ending <u>30TH MARCH</u> , 20 <u>08</u>	