

**UNIVERSITY OF NAIROBI**



**POPULATION STUDIES AND RESEARCH INSTITUTE**

**“EDUCATION AND MULTIPLE SEXUAL PARTNERSHIPS:  
THE CASE OF ADOLESCENTS IN INFORMAL SETTLEMENTS OF NAIROBI**

**BY**

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## **DEDICATION**

To my beloved parents: committed dad, John and loving mum, Claries; and my siblings, especially my caring sister Christine, for their wonderful support and love of studies. I do love you all too!

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## LIST OF ACRONYMS

AIDS	-	Acquired Imuuno Deficiency Syndrome
APHRC	-	African Population and Health Research Centre
CBS	-	Central Bureau of Statistics
GOK	-	Government of Kenya
HIV	-	Human Immune Virus
IATT	-	UNAIDS Inter-Agency Task Team on Education
IIEP	-	UNESCO International Institute for Educational Planning
KDHS	-	Kenya Demographic and Health Survey
MOH	-	Ministry of Health
NACC	-	National AIDS Control Council
NASCOP	-	National AIDS and STIs Control Programme
NCSS	-	Nairobi Cross-sectional Slum Survey
SSA	-	Sub Saharan Africa
STIs	-	Sexually Transmitted Infections
UNAIDS	-	Joint United Nations Programme on AIDS
UNESCO	-	United Nations Educational, Scientific and Cultural Organisation
UNGASS	-	United Nations General Assembly Special Session on HIV/AIDS
WHO	-	World Health Organisation

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## ABSTRACT

HIV/AIDS prevalence in urban centres has been consistently reported as higher than its prevalence in rural areas and Kenya as a whole. HIV/AIDS prevalence is higher among adolescents than in the general population. Female adolescents are more affected than their male counterparts suggesting correspondingly higher levels of risky sexual behaviours such as multiple partners. Past studies on adolescence sexual behaviours focused on poverty and substance use without accounting for the integrative dynamics of education and sex that influence sexual behaviours and determine both reproductive and sexual health outcomes. Education and having multiple partners among females remain largely unexplored especially in informal settlements of Nairobi. Evidence points to low school enrolment rates, early school dropouts, wide sex gaps in school enrolment, early coital debut and sexual concurrency as the causes of poor sexual health outcomes.

This study uses data collected from a representative sample of female adolescents in Nairobi's informal settlements to explore the relationship between education and having multiple sexual partners. African Population and Health Research Centre (APHRC) carried out the NCSS survey. The APHRC survey included an adolescence schedule to generate information on adolescence sexual health and knowledge on HIV/AIDS. This study focuses on 1,148 female adolescents in 12 – 24 years age bracket who responded to a question on number of sexual partners in a twelve-month period.

The study incorporates individual level characteristics, knowledge of HIV/AIDS and access to multimedia HIV/AIDS information in investigating influence of education on the risk of having multiple sexual partners among female adolescents. Frequency distributions and cross tabulations were employed to describe background characteristics and associations. Multiple logistic regressions, however, was the main tool of analysis and for assessing predictor variables and risk of having multiple sexual partners.

Findings indicate that approximately 35 percent of adolescent respondents had multiple sexual partners. The logistic regressions results show that the risk of having multiple sexual partners among adolescents with secondary education is 3.24 times greater than adolescents with no education considering gross effects of education. However, after controlling for demographic variables, secondary category is 1.33 times more likely to have multiple sexual partners than no education category. Adolescents with higher education are 0.07 times less likely to have multiple sexual partners than those with no education; and higher category is also statistically significant while after controlling for economic factors adolescents with higher education are 0.04 times less likely to have multiple sexual partners than adolescents with no education.

The risk of having multiple sexual partners among adolescents with higher education remained low in all the models. However, inclusion of psychosocial and multimedia access of HIV/AIDS information marginally shifts risk of having multiple sexual partners upwards for all categories except higher education. Adolescents with secondary education are 1.2 times more likely to have multiple sexual partners than adolescents with no education after controlling for psychosocial factors. Overall, the study results suggest that the odds of having multiple sexual partners varies among age groups and marital status, which contribute to the effects of education on the risk of having multiple sexual partners. The observed higher odds of having multiple sexual partners in secondary category are attributed to unstable sexual unions while lower odds of higher education are attributed to stable sexual partners among older adolescents.

## **CHAPTER ONE**

### **INTRODUCTION AND PROBLEM STATEMENT**

#### **1.1 GENERAL INTRODUCTION**

There is evidence that concerns for adolescence sexual health has been heightened since the 1990s. The heightened concerns emanated from early sexual debuts and multiple and transactional partners and high HIV/AIDS prevalence rates among female adolescents (NASCO, 2005). In many countries, heightened concerns are evident in numerous behaviour change communication (BCC) campaigns. For other societies, however, early sexual debut and adolescence pregnancies are the focus of attention in HIV/AIDS prevention efforts (Blum & Mmari, 2005). Nonetheless, BCC campaigns, age of sexual debut, number of sexual partners and transactions, cross-age sexual relations and early pregnancies concerns need an integrated intervention approach to effectively manage adolescence reproductive and sexual health challenges (World Bank, 2002).

Other evidences indicate that isolated intervention programmes for HIV/AIDS prevention are simply moderately successful. Thus, consolidated sets of sexual health and HIV/AIDS prevention initiatives are crucial (Blum & Mmari, 2005). The need to integrate HIV/AIDS protective factors is urgent, an approach that resides in education especially in adolescence period to bring adolescents together and shape their transition to adulthood (WHO et al, 2006). HIV/AIDS has devastating effects on education also. On the one hand, HIV/AIDS reduces personnel numbers especially teaching staff, reduces financial resources and increases orphanhood (UNESCO, 2003). On the other hand, education provides an opportunity with significant potentials for sexual health management and improvement and HIV/AIDS prevention (Kirby et al, 2006).

Further evidence confirms that education induces sexual behaviour in increased incomes, changing customs, and improved media access and information (WHO et al, 2006). Laundry and other (2003) looked at in-school and out-of-school comparisons of sexual behaviours. Other studies such as O'Donnell and colleagues (2005) investigated role of parental education. Local studies such as Mugisha and Zulu (2004) investigated influence of substance use; Ngom and others (2007) looked at parental processes, as Zulu and colleagues (2002) explored influence of socioeconomic status (SES). Zulu and others identified slums from KDHS using ownership of household goods. Nevertheless, the

study ignored a focus on adolescents. The above evidences mask variations and have not considered influence of education on the number of adolescence sexual partners.

The present study investigates influence of education and risky sexual behaviour in Nairobi's informal settlements. As indicated above, prior studies concentrated on substance use (Mugisha et al, 2003; Mugisha & Zulu, 2004), socioeconomic status and sexual behaviour among women (Zulu et al, 2002); and parental processes and adolescent sexual behaviour (Ngom et al, 2007). Other studies have focused on in-school and out-of-school adolescents. However, the role of education on having multiple sexual partners beyond institutional frameworks remains largely unexplored in available literature on informal settlements. Besides, adolescents form an important school age and sexually active age group with increased risk of HIV infection in an already high urban HIV/AIDS prevalence, high poverty regimes and disappointing literacy levels (APHRC, 2002).

## **1.2 BACKGROUND**

Emergence of urbanisation reflects transformation of traditional societies into modern efficient production centres (Weeks, 1999). Efficient production systems and changing consumption patterns are, therefore, major characteristics of modern urban centres. In fact, urban centres are modern socioeconomic powerhouses of societies. The concentration of socioeconomic activities in urban centres has in turn contributed to rural-urban migration. Urbanisation increases selective migration, which in turn induces age-sex structures and socioeconomic characteristics of residents (UN, 1975). However, urbanisation in most developing countries is incapable of coping with high rates of rural-urban migration and urban fertility. The urban collective infrastructures do not generate adequate employment prospects, suitable housing, education support and other social amenities hence emergence of informal settlements (Mugisha et al, 2003).

Africa has its share of informal settlements, which spread across its urban centres because of economic stagnation and, in most cases, decline, as in the 1980's and 1990's (Mugisha et al., 2003). In fact, urban poor are mostly residents of informal settlements, who are overwhelmed with low incomes, high school dropout, high mortality, high fertility, low support for education, low school enrolment, job losses, crowded housing, substance use, and information inaccessibility. The residents live without security of

tenure and at risk of eviction. The urban poor are least empowered in terms of income and access to education and health services (Weeks, 1999: UN-HABITAT, 2005). Low education attainments in turn contribute to redundancy, casual labour schedule, ignorance and poor sexual health outcomes. The emergence of the HIV/AIDS pandemic, moreover, contributes to stagnation of SSA economies (Hollander, 2003). The HIV/AIDS pandemic manifests high incidence in urban settings and most infections take place among less educated female adolescents in poor urban neighbourhoods (Mugisha et al, 2003).

Nairobi is no exception to the overurbanisation phenomenon coupled with economic crumbles hence challenges such as poverty and poor access to health and education services leading to few employment opportunities, low educational attainment, substance use, unhealthy cultural and religious practices and unhealthy reproductive behaviours and its outcomes (Mugisha & Zulu, 2004). The economic decline is made worse beside dampened social infrastructures, which have not kept pace with the influx of urban bound economic migrants and high urban fertility. The city's population has outgrown its available educational facilities and opportunities. Urban poverty has, besides, given rise to increased school dropouts, low educational attainment, school non-attendance and related problems such as low-income levels, substances use, crime and increased risk of having multiple sexual partners (Clark, 2004). The urban outgrowth is additionally reflected in scarce drinkable water, improper sewage disposal systems, inadequate housing and sporadic electricity supply (Mugisha et al, 2003).

Nairobi's informal settlements are estimated to accommodate about 60 percent of the city's residents while only occupying 5 percent of the city's total land space (Mugisha et al, 2003). The settlements embody poverty indicative of economic decline, rising unemployment and poor educational infrastructure (Mugisha & Zulu, 2004). Besides, the settlements witness deplorable health indicators, low school enrolments and high school dropouts; wide sex gaps in school enrolment rates, substance use, and less gainful occupation choices among female adolescents (Mugisha et al, 2003). High student numbers strain fragile education systems hence a decrease in success making students unprepared for expert occupation, health services utilisation and HIV prevention (WHO et al, 2006). Less educated female adolescents can ill-afford recreational facilities thus

engage in risky sexual activities such as having multiple partners, early sexual debuts and transactional sexual relations hence vulnerability to HIV infection (Zulu et al, 2002).

HIV vulnerability is conspicuously higher in informal settlements than other parts of Nairobi and in deed Kenya (Zulu et al, 2002; Hollander, 2003). HIV-risk encounters such as early sexual debut, multiple and transactional sexual partners, injecting drug use (IDU), incorrect and inconsistent condom use, HIV/AIDS stigmatisation and misconceptions and inadequate media access to HIV/AIDS information are common (Mugisha et al, 2003; Gupta et al, 2003). Female adolescents embark on commercial sex, become victims of rapes and have cross-age and cross-class heterosexual partners, engage in sexual concurrency and early coital debut hence increased risk of HIV infection (Mugisha & Zulu, 2004). Studies indicate that forced sexual intercourse has less chance of condom use, which increases likelihood of HIV infection (Boerma & Weir, 2005).

Deviant sexual behaviours and high HIV risk activities extend beyond adolescent age groups. Older women are also identified with participation in transactional sex and multiple partners, and substance sale and use. Substance use carries little association with condom use. Parents with high rates of substance use and sale and engage in commercial sex and violent crimes expose adolescents to high-risk sexual activities (Mugisha et al, 2003; Kaufman et al, 2004). Peer pressure is also known to originate from school age adolescents sharing houses, which is due to lack of parental guidance, communication and care hence increased vulnerability to HIV/AIDS related high risk sexual behaviours such as school drop outs, substance use, violent crimes, less family bonding, multiple partners, transactional sex and forced sex (Kaufman et al, 2004).

Educational support and enrolment rates in informal settlements are lower than in all other parts of Nairobi. School drop out rates are high mainly due to poverty. Most adolescents do not live with parents because of either orphanhood or sharing houses with out-of -school adolescents (Mugisha et al, 2003). Some adolescents, however, share one-roomed houses with parents hence exposure to parental sexual experiences. Coital debut is early in these communities and condom use is the lowest in the country. Adolescents in these settlements are mostly uneducated, lack sexual health information and services access, engage in cross-age and cross-class sex, are unemployed, use substances, initiate or are victims of multiple sexual partners engage in crime and experience poor health

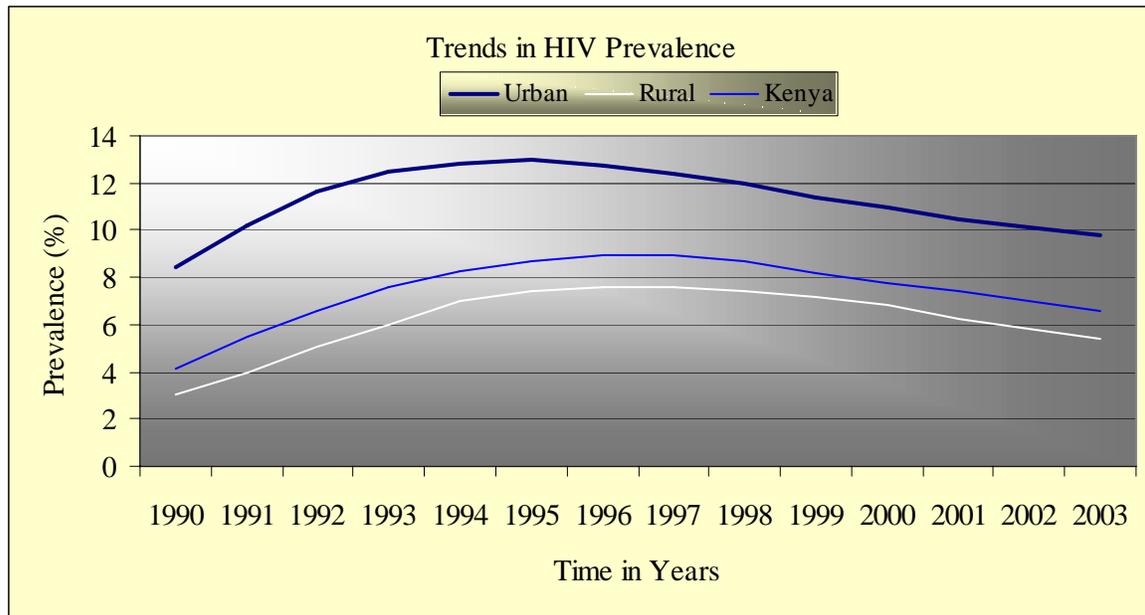
outcomes. Thus, life of adolescents in informal settlements poses a crucial threat of unhealthy sexual behaviours thus increased risk of HIV infection (APHRC, 2002).

Nevertheless, education notably integrates economic, cultural, health and social background factors of individuals and societies. In most cases, education begins before sexual debut and therefore stands a chance of influencing sexual health long before initiation of coitus with possibilities for sustenance over adulthood. Education targets both individual level risks as well as contextual level HIV/AIDS vulnerability factors (UNESCO, 2003). Education interventions should target equipment of teachers with HIV/AIDS knowledge; scientifically accurate HIV/AIDS materials; promotion of life skills; elimination of stigma and discrimination; school health programmes support; and gender equity (UNESCO, 2003). However, residence and income differentials persist with adolescents from poor urban families lagging behind in access and quality of education, attainment levels and attendant low income levels, HIV/AIDS information inaccessibility, substance use and unhealthy customary practices (WHO et al, 2006).

#### **1.4 PROBLEM STATEMENT**

HIV/AIDS pandemic is a global problem and it is estimated that approximately 39.4 million people are currently infected with the disease. There are roughly 4.9 million new infections annually particularly in the year 2004, which reflects high disease incidence rates (UNAIDS/WHO, 2004). Evidence indicates that 75 percent of HIV/AIDS infected people live in SSA making it the hardest HIV/AIDS hit region in the world as a whole (NASCO, 2005). HIV/AIDS is the leading cause of death among female adolescents in SSA and central modes of transmission are heterosexual contacts and perinatal transmission (WHO et al, 2006). Unintended pregnancies, Sexually Transmitted Infections (STIs) and HIV/AIDS are significantly high in SSA, a situation which calls for concerted efforts of integrative preventive ways in order to contain reproductive health (RH) hazards and related deaths especially among female adolescents aged 12 – 24 years, which is amounting to 33 percent of the total population of SSA (GoK, 2006).

FIGURE 1.1: TRENDS AND VARIATIONS IN HIV PREVALENCE



Source: Kenya HIV/AIDS Data Booklet, 2005

HIV/AIDS prevalence in urban centres is higher than its prevalence in rural areas as reflected in figure 1.1 above. In fact, people in urban centres bare more than half of HIV/AIDS cases and new HIV infections (NASCO, 2005; NACC, 2005). The most vulnerable groups include poor people especially adolescents living in poor urban settlements (Desbarats, 2004). The situation is even worse for female adolescents in informal settlements that form an important proportion of sexually active populations at heightened reproductive and sexual health risks. The adolescents are at a delicate risk of unintended pregnancies, STIs and HIV/AIDS due to poverty, inadequate education support, wide sex gaps in school enrolment rates against females, high illiteracy levels, school drop outs, early coital debuts, having multiple sexual partners, low or incorrect condom use and early marriages. Female adolescents are mostly unaware or deluded about sexual health and are reluctant to take protective actions (Mugisha et al, 2003).

Although HIV/AIDS awareness is nearly complete in Nairobi's informal settlements, knowledge gaps are persistent and behaviour change is generally below average (Mugisha et al, 2003). Sex gaps in school enrolment rates are wide, more female adolescents generally drop out of school than males. Besides, only 40 percent of adolescents abstain as a preventive measure against HIV/AIDS. Roughly 83 percent

adolescent females reported one sexual partner. However, multiple sexual partnerships are present and adolescents in informal settlements are at increased risk of multiple sexual partners than in Kenya as a whole (APHRC, 2002). In general, coital debut is early and STIs are common. The median age at first sexual experience is 16.1 years for males and 16.3 years for females. Furthermore, only 56 percent of adolescents mention avoiding sexual concurrency while 46.8 percent females mention condom use in avoiding HIV infection. Most adolescents are aware of HIV/AIDS except those who have no education. Few adolescents know of avoiding kissing, untested and contaminated blood transfusions, or injections as ways of avoiding HIV infection (Mugisha et al, 2003).

World Bank (2002) has reported that education is associated with realisation of six of the eight Millennium Development Goals (MDGs): reducing poverty, universal primary education, gender equality, reducing child mortality, improved maternal health and low HIV/AIDS prevalence. Education, therefore, has profound potentials to integrate and scale up HIV/AIDS preventive efforts for female adolescents' reproductive and sexual health. For example, educated female adolescents are likely to delay marriage; have few healthy children; have good earning potential and personal skills, and so reduce sexual risks and exposure to HIV/AIDS (World Bank, 2002). Education reduces poverty, raises formal employment as well as reductions in gender disparity. Evidence has shown that low child mortality reduces fertility as child survival is improved (Clark, 2004).

Blum and Mmari (2005) identified education as one of the most integrative and effective HIV/AIDS protective factors. However, the protective role of education is undermined by the low school enrolments rates in Nairobi's informal settlements, which is below that of other parts of Kenya. The situation is worse for the 15 – 17 years female age group. For example, only 22 percent of the 15 – 17 year old females attend secondary school. The 12 – 14 years age group registers higher (primary school) enrolment rates than secondary schools. For instance, 85 to 90 percent, males, and 89 – 96 percent, females are enrolled in school. However, secondary attainment data only indicate 40 to 33 percent of males and females in that order, a percentage that is also partly attributable to selectivity effects of rural-urban economic migration (APHRC, 2002).

Consistent and correct condom use can almost entirely prevent early pregnancies and HIV/AIDS infection (Auerbach et al., 2006). However, even though condom use is

rising among female adolescents (WHO et al, 2006), evidence indicates that 44 percent of adolescents don't have access to condoms albeit 94 percent know that condoms prevent STIs and HIV transmissions. Most affected are those aged 18 – 20 and married ones who are less likely to use condoms assuming safety in marital sex. Moreover, nearly 50 percent of female adolescents believe that there is a small chance of getting HIV/AIDS, while slightly more than 33 percent believe there is no risk at all. About 30 percent of females perceive that they can know HIV status of a person physically (APHRC, 2002).

Circumstances of sex, especially first sexual encounters, are known to influence safe sex as in condom use or none use and violent sexual intercourses (Anderson et al, 1990). Circumstances of informal settlements adolescents' first sexual encounters reflect varied circumstances. Curiosity appears to play a vital role in coital debut. The female adolescents' first sexual encounters are mostly coercive and a significant proportion of males report peer pressure as a major influence. First sexual partners of female adolescents are either peers or sexually experienced older adolescents and adults (Zulu et al, 2002). Such first sexual encounters are usually non-negotiated and devoid of condom use, which increases exposure to HIV/AIDS infection (Mugisha et al, 2003).

HIV/AIDS misconceptions are important determinants of safe sex. HIV/AIDS awareness is almost universal in slums. Nonetheless, knowledge gaps persist and behaviour change is below expectations (Mugisha & Zulu, 2004). Such gaps can be dangerous such as when infected men seek out young girls as safe sex objects (World Bank, 2002). Females are generally poorly informed than males. For instance, there are beliefs that oral contraceptives can prevent HIV infection and that the AIDS virus can pass through unspooled condoms (World Bank, 2002). Roughly 86 percent of female adolescents believe that an HIV positive woman always gives birth to an HIV positive child. Forty percent of adolescents believe that HIV can be transmitted through insects' bites while around 20 percent of female adolescents believe that HIV status is conceivable through observation (APHRC, 2002).

## **1.5. RESEARCH QUESTION**

Does education have an influence on whether female adolescents in informal settlements of Nairobi have multiple sexual partners?

Do background factors partially account for the effects of education on the risk of having multiple sexual partners among female adolescents in informal settlements?

## **1.6. OBJECTIVES OF THE STUDY**

### **1.6.1 GENERAL OBJECTIVE**

The main objective of this study is to examine influence of education on the risk of having multiple sexual partners among female adolescents in informal settlements of Nairobi.

### **1.6.2 SPECIFIC OBJECTIVES**

The specific objective is to explore influence of education on risk of having multiple sexual partners among female adolescents in Nairobi's informal settlements.

To explore background factors that partially account for the effect of education on the risk of female adolescents having multiple sexual partners.

## **1.7. JUSTIFICATION FOR THE STUDY**

Adolescence is a crucial phase that carries great potentials and risks. It is a period of rapid physical and psychological developments along with factors such as lack of HIV/AIDS knowledge, illiteracy and poor access to health services. The population of adolescents is 20 – 30 percent in SSA (Dick et al, 2006). In total, 50 percent of HIV transmission takes place among those aged 12 –24 years. There is growing concern for sex disparity in HIV infection levels against female adolescents. Since there are both short and long term consequences of having multiple sexual partners hence demographic outcomes, relevance of improved knowledge on education and risk of multiple sexual partners and outcomes cannot be gainsaid (Nduati & Wambui, 1997; Luke, 2003).

Most multiple sexual partnerships are formed in adolescence because of ignorance or powerlessness. However, mortality consequences of having multiple sexual partners are felt in older age groups, which then shift age specific mortality rates. Besides, the

unique situations of levels of education of adolescents and age groups have been noted to give rise to contextual sexual behaviours (Mugisha et al, 2002). These factors include changes in economic conditions and social and cultural choices. The government on its part normally formulates policies at an aggregate level, which at times misses out on context specific opportunities and individual characteristics hence the need for an integrated research to formulate relevant policies on education to effectively achieve desired reproductive and sexual health targets.

### **1.8. SCOPE AND LIMITATION**

The targeted population is female adolescents aged 12 – 24 years even though sexual activity ranges both before and beyond those age groups in the population. The study is limited to APHRC (2002) data set. Measurements methods and definitions of variables are restricted to those used by the available data. The study uses secondary data from APHRC also known as Nairobi Cross-sectional Slum Survey (NCSS), which is a cross-sectional survey; hence, changes in covariates cannot be studied. For example, ones' educational attainment, marital status, age, employment status and economic status may change at times. Regardless to indicate, informal settlements are restricted to Nairobi, which is not necessarily representative of other urban centres. Nairobi is perhaps richer and its location ties it to all other parts of Kenya (trade and economic migration).

In addition, although the concept of chronological age is particular, age reporting is still subject to different types of errors such as mis-statement, a tendency to report ages ending in certain preferred digits and ignorance of correct ages among other errors (UN, 1975). The study did not re-interview respondents to ascertain correct ages. Age underreporting may distort statistical significance of the tests carried out as well as regression results hence misrepresentation of population characteristics. Sex reporting is also at times underreported among females. The practice of sex underreporting is perhaps common among married female adolescents to avoid mistrust. Time for carrying out the research was also limited. Financial and personnel resources were other sources of inadequacy felt for carrying out our study hence restriction to use of secondary data.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 INTRODUCTION**

HIV/AIDS transmission is rooted in a range of long-term socioeconomic, cultural, biological, demographic and psychosocial background factors. These background factors include sexual behaviour, poverty, education, migration and urbanisation among others (Blum & Mmari, 2005). However, contemporary HIV/AIDS prevention interventions concentrate on behaviour change communication (BCC) campaigns, which are short-term and, in most cases, isolated programmes. Effective HIV/AIDS prevention programmes require long-term multi-sectored approaches directed at the most vulnerable groups such as adolescents (Dick et al, 2006). For that reason, identifying long-term multi-sectored intervention programmes is crucial for sustainable HIV prevention (UNAIDS, 1999).

Djamba (1997) has reviewed some background factors that explain female sexual behaviour in Africa. He contended that background factors could be grouped into anthropological, economic and social perspectives. The social perspective related sexual health to changes in society and made an assumption that HIV risk sexual behaviours results from breakdown in cultural and economic cohesions (UNESCO, 1999). The social perspective identified education, urbanisation, income and mass media among the correlates of social breakdown. The perspective then linked these correlates to sexual liberalisation among females. The major advantage of the social perspective is its attempt to integrate various perspectives of sexual behaviour (Djamba, 1997).

The social perspective identified education as one of the most important correlates of social change; an urgent for personal growth; and for avoiding possible harmful outcomes of sexual relations such as unplanned pregnancies and HIV/AIDS infection (Bongaarts & Cohen, 1998). For instance, evidence indicates that better educated adolescents are more likely to adopt safer behaviours as means of avoiding infections become increasingly known (World Bank, 2002). Other studies also show that there is a negative correlation between adolescents' levels of education and HIV infection. For example, a study in Zambia found marked declines in HIV prevalence among adolescents with secondary education in comparison to female adolescents with primary education indicating that higher levels of education offer HIV protection (cf. Kelly, 2000c).

## **2.2 THEORETICAL FRAMEWORK**

Attempts to explain sexual behaviour and HIV/AIDS generate several models in literature. Some of these models focus on individual processes, some emphasise social relationships, and still others centre on structural processes (UNAIDS, 1999). The theoretical multiplicity has been attributed to the fact that HIV/AIDS epidemic is dynamic in terms of underlying determinants of sexual behaviour, which are reflected in outcomes of desires, social, economic and cultural relations, and environmental processes. Consequently, there is a need to design multi-sectored integrated approaches to effectively address sexual health since no one theoretical position generates adequate hypotheses to study sexual behaviour in its multiple manifestations (Djamba, 1997).

For the purposes of integrated approaches, drawing clearly defined borders among any perceived analytical models is futile and ends up in overlaps. The apparent divisions only converge in recognition of contextual nature of sexual behaviour and interactions of individual and contextual factors (UNAIDS, 1999). As noted previously, the application of multiple theories for analysis of sexual health confronts several challenges, which makes it difficult for focused studies on specific interventions hence the need to identify integrative models. The major reason for an integrated approach lies in the fact that studies on sexual health appreciate models that focus on catalysts of associations of individuals and background factors to provide an adequate contextual understanding of determinants of sexual health in any setting (Boerma & Weir, 2005).

Several individual analytical models have been identified that relate sexual health to intervention. Nevertheless, controversies still surround the multiplicity of models of sexual behaviour. Nonetheless, theories contain useful conceptual relations that enhance clarity although most behavioural frameworks focus on micro variables without adequate attention to background factors (Djamba, 1997). Perhaps the assumption for concentrating on micro determinants is that individual variables reflect background factors. The individual behavioural change analytical models in literature include: Health Belief Model (HBM), Stages of Change Theory (SCT), Biosocial Model of Adolescent Sexual Behaviour (BMASB) and AIDS Risk Reduction Model (FHI, 2002).

Health Belief Model (HBM) views health-seeking behaviour as a function of individual socio-demographic characteristics, knowledge and attitudes. The most crucial

attitudes in HBM are: perception of susceptibility, health status of the individual, effectiveness of adopted behaviour, clues to expected health status, and rewards and barriers to expectations (FHI, 2000). HBM takes into account possibility of changing individual personal attitudes, which involves a trade-off between perceived benefits against opportunity costs in terms of current behaviour patterns. For example, it is cited that HIV interventions programmes target perception of infection risks, HIV/AIDS attitudes, opinions on condom use and initiation of sexual activity (UNAIDS, 1999).

Social Learning Theory (SLT) emphasises consequences of modelling behaviour experiences upon perceived conventional patterns in society. The theory considers human behaviour as a continuous process of interaction involving cognitive, behavioural and environmental factors (UNAIDS, 1999). The dynamism of SLT presumes self-efficacy and benefits of expected outcomes of adopted health-seeking behaviour. Integration of information and attitudinal change thus becomes imperative in effective HIV risk-reduction. The integration focuses on personal experiences of others as well as safe sex and beliefs in experiences and barriers to HIV risk reduction efforts (FHI, 2002).

The Social Cognitive Theory (SCT) explains health-seeking behaviour as a dynamic process of knowledge acquisition, behaviour modification and natural influences upon the individual. The processes build on experiences, which generate the need for awareness of precedent behaviour experiences (UNAIDS, 1999). SCT views information as geared towards reward of acceptable behaviours and motivated through the desire to avoid harm and remain healthy in the midst of undesirable realities such as HIV/AIDS and its consequences. For example, adolescents' intervention programmes should focus on experiences on sex discussions, condom use and environmental risks and consequences of unsafe sexual behaviour (UNAIDS, 1999).

The Theory of Reasoned Action (TRA) focuses on attitudes towards outcomes of behaviours and social opinions and expectations on individuals. According to TRA, human behaviours are means of attaining preset social norms. It assumes rationality in applying set social norms in human behaviour and systematic application of information received on expectations. Consequences of contextual and voluntary actions as a result become crucial factors of collective human behavioural intentions. TRA focuses on perceptions of inclinations, benefits and constraints to behaviour change and

determinants of attitude and societal expectations to explain human health-seeking behaviour (UNAIDS, 1999).

The present study uses the AIDS Risk Reduction Model (ARRM) to explain an hypothesised link between education and having multiple partners as well as probable risk of HIV infection. ARRM provides a framework for explaining sexual behaviour change attributable to education. The major reason in applying ARRM is that it borrows from Health Belief Model and Stages of Change Model to come up with an integrated approach (UNAIDS, 1999). ARRM sets three stages for behaviour change: i) recognising and labelling behaviour as risky, ii) making a commitment to reduce high HIV risk sexual activities, and iii) taking action to reduce chances of HIV infection. Action is again divided into information seeking, obtaining remedies and solutions (FHI, 2002).

ARRM proposes motivators to behaviour change such as education since sexual activity is largely a social construct apart from its biological components. The social construction uses ARRM to look at a multiplicity of populations, including adolescents and their reproductive health practices and behaviours (UNAIDS, 1999). ARRM thus adopts a socio-economic approach, which emphasises biological, cultural, environmental, and physical settings contributions (FHI, 2002). Consequently, ARRM's socio-economic approach explains understanding education as an intervention (Djamba, 1997).

The ARRM relies on conceptions of socio-cultural processes that influence sexual desires and partnerships. It operates through identity, meaning and sexual communication to explain sexual behaviour (UNAIDS, 1999). ARRM recognises that several cultural variables interact with education and influence sexual behaviours and patterns. First is knowledge of HIV risk sexual activities, weakness of infection and undesirability of HIV/AIDS. Second are costs and benefits of action, self-efficacy, health utility and sexual pleasure. Third are cultural links, which include networks and problem solutions, self-esteem, contacts, partners' beliefs and sexual health (Djamba, 1997; FHI, 2002).

ARRM relates education and demographic processes in offering protection against HIV/AIDS infection. Education reduces risks through information and skills provision; increasing connection and security; making informed choices on role models; and improving literacy and economic opportunities (FHI, 2002). Education can also reduce HIV/AIDS infection risks though delaying age at first sex, increasing condom use,

less sexual partners, early diagnosis and action on STIs, access to classified voluntary counselling and testing (VCT), and reducing other forms of mediating behaviours such as substance use, and injecting drug use (IDU) among others (UNAIDS, 1999).

Benefits of ARRM are many and multi-sectored. The theory integrates background variables: social, economic, demographic, psychosocial and cultural factors. It is postulated that these factors interact with individual characteristics, HIV/AIDS knowledge and exposure related factors to influence sexual behaviour and reproductive health. ARRM therefore effectively broadens views on sexual behaviour and activity among female adolescents (UNAIDS, 1999). It demonstrates the fact that all cultural, economic and demographic factors in various theoretical perspectives eventually collapse or converge into one analytical model to explain sexual behaviour (Djamba, 1997).

Since ARRM is a construct of apparently definite yet overlapping theoretical perspectives, it emphasises interaction of background factors, which influence individual HIV/AIDS knowledge and exposure related issues (UNAIDS, 1999). As noted earlier, it consolidates hypotheses of various models into one framework. The integration is crucial because purposive actions and contexts generate respective self-interests and argents of action. The integration provides an opportunity to use one analytical framework for multi-sectored and consolidated approaches to HIV/AIDS interventions. On the other hand, a structured review of demographic, cultural, socioeconomic and psychosocial factors provides a clearer picture of background factors and mediating variables.

### **2.3 EDUCATION AND DEMOGRAPHIC FACTORS**

ARRM in essence recognises demographic, cultural, biological economic, and psychosocial factors to explain sexual behaviour (UNAIDS, 1999). Demographic variables are considered important background determinants of sexual partnerships and vulnerability to HIV/AIDS infection. There is evidence in literature to suggest that education interacts with demographic variables to determine adolescence sexual behaviours (Blum & Mmari, 2005). In addition, other HIV/AIDS transmission efficiency risk factors such as condom use and STIs account for some of education on the probability of HIV infection (Fontanet & Piot, 1994). We first examine the theoretical linkages of education and sexual partners in relation to demographic factors.

HIV/AIDS is an important global killer and the leading one among 15 – 29 age group in Sub Saharan Africa (SSA). Global figures indicate that 50 percent of new HIV infections take place among adolescents and that as many as 5000 – 6000 adolescents become HIV infected daily (Blum & Mmari, 2005; Dick et al, 2006). Adolescents also carry undetected HIV infection hence latent spread to other sexually active age groups in the general population. There is increasing evidence to suggest that female adolescents carry higher HIV/AIDS prevalence than their male counterparts. Studies suggest that female adolescents exposure factors include: sexual feelings, early marriages and initiation of childbearing, cross-generational sex, STIs, low condom use, orphanhood and general poor access to reproductive health services (Dick et al, 2006).

Adolescence sexual feelings are outcomes of child-adult transition. Nonetheless, reactions to these feelings vary. Reactions to sexual feeling also vary and may include sexual intercourse, abstinence and kissing among others (Blum & Mmari, 2005). Some forms of reactions such as early sex and pre-arranged marriages have become frequent and lead to different reproductive health outcomes (Clark, 2004). Studies reveal that low educational attainment rates among adolescent are associated with early marriages with negative consequences for sexual health. However, high education delays marriage, reduces childbearing pressures, increases condom use, which reduce sexual activity and possibly having multiple sexual partners and HIV/AIDS vulnerability (WHO, 2006).

Female adolescents' early marriages contribute to cross-generational sex as such marriages are usually to older sexually skilled and at times already STIs/HIV infected men (Spanier, 1975). Marriage is a social institution that confers sexual responsibility on individual adolescents. However, age and non-assertive female stereotypes maintain sex disparity in sexual relations. The disparity makes it difficult for adolescents to discuss sexual health issues such as family planning (FP), condom use and protection from STIs and HIV through having non-multiple partners. In many SSA societies, young couples are encouraged to initiate childbearing early, which contributes to increased unsafe marital sexual activity and risk of HIV infection (Cubbin et al, 2005).

Related to increased age at first marriage is the gap between puberty and marriage (Magadi & Curtis, 2003). Consequently, many adolescents engage in non-marital sexual activities and have multiple partners (Spanier, 1975). Non-marital sexual activity comes

with stereotypes, which put female adolescents at increased risk of HIV/AIDS infection (Mensch et al, 2003). For instance, some pre-demographic transition societies tolerate early and unhealthy male sexual behaviours including having multiple partners (Cynthia et al, 2005). However, women are often socialised to abstain from non-marital sexual relations. Consequently female adolescents are put at a disadvantaged position that impedes meaningful communication, accepts unsafe sexual partners and low levels of condom use especially in marital sex (Mensch et al, 2003).

Studies have indicated that education interacts with social proximate determinants of fertility such as children ever born to influence having sexual partners. Evidence shows that well educated and low child mortality populations are associated with fertility declines hence less sexual partners formations. Education induced migration and spousal separations therefore modify sexual behaviour, which in turn influences fertility levels (Cornejo & Andina, 2007). On the other hand, short-term spousal separations have been noted to encourage casual and transactional sex in the absence of marital sexual partner hence inclusion into having multiple partners. Educated urban couples are so, at increased risks of HIV in the face of multiple partners (Blum & Mmari, 2005).

Education plays a role in access of health services and early treatment of STIs and HIV/AIDS (WHO, 2004). Studies have suggested that STIs are important HIV transmission efficiency risk factors (WHO, 2004). Health services utilisation and treatment of STIs is therefore crucial in HIV/AIDS prevention. The health sector is responsible for accurate information as it identifies underlying factors that cause HIV vulnerability. It provides diagnosis, treatment of STIs and provision of condoms. For instance, studies indicate that education reduces ignorance, which is one of the reasons for delays in STIs treatment. Therefore, education and health services utilisation influences adolescence reproductive health needs and HIV prevention (WHO, 2004).

Education is consequently linked to demographic processes that influence sexual activity and behaviour hence HIV/AIDS transmission. Studies indicate that education delays age at first marriage and consequently marital sexual activity while at the same time increasing risk of having multiple partners (WHO, 2006). For example, higher levels of education increase median age at first pregnancies (WHO, 2004). Sexual debut, contraceptive and condom use, marriage, STIs treatment and cross-age sex are so

associated with levels of education. For example, more married and less educated adolescent girls than unmarried educated ones engage in unprotected sex and restrict condom use to non-marital sexual activities and are exposed to spouse's multiple partners hence high risk of HIV infection (Fontanet & Piot, 1994; WHO, 2006). It is also true, however, that education is positively associated with increased spousal separation and reduced fertility, which encourage having multiple partners.

## **2.4 EDUCATION AND CULTURAL FACTORS**

The second link between the role of education in HIV transmission and background factors is in cultural control or kinship. Sengendo and Sekatawa (1999) described culture as complex sets of distinctive spiritual, material, logical and emotional features that characterise a social group. Culture therefore encompasses arts, ways of life, rights, value systems and beliefs. In addition, culture defines a way of community integration and consists of identifying activities. It has been noted that cultural variables define sexual attitudes, norms and partners. For instance, Djamba (1997) argues that kinship is a better measure of cultural influence on sexual partners since social control is largely vertical such that older generations maintain control over adolescents.

The following discussion highlights the role of culture in adolescence sexual health and its outcomes in light of education. To begin with are cultural practices that shape marriages and childbearing (Raynolds, 1994). Studies have shown that high fertility attitudes facilitate increased sexual partners and risk of HIV infection (WHO, 2006). Besides, agents of transformation such as education influence the course of local cultural dynamics and in turn, fertility levels hence sexual partners and HIV/AIDS control. The influence of education on transformation of cultural norms and practices resulting from migration, urbanisation and secularisation set the stage for the onset of contraceptive use and fertility transition in many societies and is also likely to influence spread of HIV/AIDS through changes in sexual behaviours (Gregson et al., 2005).

Evidence indicates that education is inversely associated with high fertility norms and enhances maintenance of consistent condom use. Such high fertility norms are more open to extensive sexual partners formation and activity hence increased risks of HIV infection. Cultural practices associated with high fertility regimes such as early sexual

debut, early marriage and taboos on premarital sexual intercourse also respond to education to influence HIV spread. For example, cultural expectations such as early childbearing and post-partum abstinence expose men to extramarital partners and in turn spouses. However, some cultural practices, for instance, male circumcision, afford some protection against HIV/AIDS (Caldwell et al., 1994).

Childbearing is considered an important cultural indicator of status in pre-transition societies. In traditional societies, men frequently rejected infertile sexual partners, a practice that resulted in polygyny (Orubuloye et al., 1994). Consequently, the rejected women resorted to extramarital sexual activity to prove their fertility, which actually hastens participation in having multiple partners. The situation is worst for less educated female adolescents as transactional sex takes over as a means of earning a living, which creates multiple partners. Such women are vulnerable as choice of partners and safe sex bargain is restricted and children born to such women tend to adopt risky sexual behaviours as well (Mugisha et al., 2003).

Further evidence suggests that education is inversely associated with traditions that render women unable to negotiate for safe sex such as widow inheritance and reservation of condom use for extramarital sex. The presumed subordination status of women makes the epidemic partly a product of culturally sanctioned partner change and sex (Mason, 1994). However, the above assumptions only hold in situations where women are motivated to negotiate for safe sex. On the other hand, attempts to improve women conditions through education can result in open sexual perspectives receptive to multiple sexual partners and STIs and HIV infection. Therefore, education has mixed contributions to having multiple partners and spread of HIV/AIDS (Mason, 1994).

Religion is another cultural variable that is receptive to influence of education especially during adolescence. There are various types of religions and denominations in SSA: Catholicism, Protestantism and Islam among others. Most religious beliefs aim at restricting premarital and extramarital sexual activity and pregnancies. For example, traditional religions frowned upon barrenness and sexual activity before initiation rites (Raynolds, 1994). Christianity frowns upon polygyny while Islam on the other hand, provides for multiple sexual partners. However, most contemporary African societies are

largely Christian or Moslem, a situation that disapproves of sexual relations outside marriages even though Islam religiously approves polygyny (Orubuloye et al., 1994).

## **2.5 EDUCATION AND SOCIOECONOMIC FACTORS**

The ARRM incorporates socioeconomic factors as determinants of sexual health and incorporates three forms of economic variables that are important in HIV/AIDS control as financial, human and social resources (UNAIDS, 1999). The three forms of economic resources, especially financial capital, aid the operations of social and family activities. Djamba (1997) conceptualises family social and family operations in terms of household amenities, employment and information access. ARRM recognises social and family operations are important components of economic hypothesis postulating rational interpretation of sexual activities such as transactional sex and multiple partners. The rational hypothesis assumes a negative association between capital and commercial sex and having multiple partners (Mugisha & Zulu, 2002).

Studies identify many forms of economic factors that are receptive to influence of education. For instance, education adds to economic viability and enhances employment opportunities, improves living arrangements and purchasing power among others (Djamba, 1997). Education, however, contributes to HIV/AIDS prevention through changing economic proximate determinants of having multiple partners such as family resources and living arrangements (Hollander, 2003). Zulu and colleagues (2002), for example, in a study on women's sexual behaviour, found that poor urban women were likely to have multiple partners. The study indicated that residents of informal settlements initiate coitus early and are likely to engage in transactional and have multiple sexual partners. The same study also indicated that HIV/AIDS prevention knowledge is markedly lower among the most disadvantaged groups (Mugisha & Zulu, 2004).

Risky adolescent sexual behaviour is linked to economic freedom as in access to employment, information and knowledge (Mugisha et al, 2003). The association between education and sexual health is through adolescents' economic needs, which explain sexual activities such as transactional sex and cross-age sex. Low financial capital limits access to essential services such as health facilities. The situation is even worse for adolescent females in poor urban settings. For example, Zulu and colleagues (2002)

suggested parallel trends of urban poverty and HIV risk sexual behaviour, a situation that finds its explanation in the rational hypothesis (Djamba, 1997).

However, education-economic processes interaction has mixed allusions for HIV control. For example, there is evidence to suggest that education and increased incomes liberalise sexual mores that facilitate HIV/AIDS spread (Blum & Mmari, 2005). In addition, evidence indicates that couple separation in search of income and employment opportunities and income differentials arising from high educational attainment can be contributed to greater heterogeneity in rates of sexual partner change and lead to less choices, multiple partners and transactional sex, which increase the risk of HIV infection among sexually active age groups (Zulu et al., 2002).

Education equips adolescents with information and decision-making skills and is crucial in bridging existing gaps in HIV/AIDS knowledge. Many adolescents are of school age and have misconceptions about HIV/AIDS (UNAIDS, 1999). However, some evidence has suggested that there is a positive correlation between level of education and risk of having multiple partners hence risk of HIV/AIDS infection. The positive correlation results from mobility of educated adolescents, which enables exposure to various partners. Proponents of preventive role of education counter that education seldom includes prevention or BCC and that level of knowledge about the disease has been low, which then calls for increased investment (World Bank, 2002).

Education influences adolescents' sexual behaviour in various ways. These multidimensional influences are crucial opportunity-enhancing agents that shape sexual attitudes and behaviour. New roles and role models emerge during the education processes that eventually influence choice of partners. New role models emerge because adolescents' sexual behaviour is a function of expectations of peer reference group irrespective of social expectations. In addition, parental lifestyles and living arrangements can play the role of reference group (Mirande, 1968). Besides, most adolescents live with parents, which could expose them to parental sexual behaviours (Mugisha et al, 2003). It has furthermore been noted that congested households especially expose adolescents to parental sexual experiences and lead to sexual compulsion, which eventually lowers self-esteem and ability of refusal of unwanted sex (Mugisha & Zulu, 2004).

## **2.6 EDUCATION AND PSYCHOSOCIAL FACTORS**

The last components of background factors that have been hypothesised links education and having sexual partners are psychological variables. These psychosocial variables consist of substance use, misconceptions and stigma and HIV/AIDS knowledge among others. For instance, studies propose that substance use increases risk of having multiple partners and HIV infection (Gillmore et al, 1992). Other studies such as Mugisha and Zulu (2004) found that adolescents who use alcohol and drugs reported higher risk of HIV infection. The study revealed that out-of-school adolescents engage in high substance use and have multiple partners. Similar studies in Uganda concluded that alcohol consumption is associated with irresponsible sexual behaviour such as unwanted sex and multiple partners (Sengendo & Sekatawa, 1999). These associations of substance use and multiple partners mask significant HIV/AIDS awareness levels (WHO, 2005).

Despite generally high levels of HIV/AIDS awareness, there persist misconceptions and stigma. UNESCO (2002) noted that such gaps contribute to high rates of new HIV infection. In South Africa for instance, a survey reported a belief that HIV positive people always show physical symptoms of the disease. The belief in physical manifestations of the disease leaves many HIV infected adolescents in sexual relations and even stable unions such as marriages. In a study in Kenya, HIV/AIDS orphans supposed that their parents had died from witchcraft. Evidence given have also detailed beliefs such as the role of oral contraceptives in HIV/AIDS prevention and that HIV is capable of passing through undamaged condoms (World Bank, 2002).

Stigma and discrimination are social diseases or representations that societies connect with disease and its victims. The social diseases have not been left behind in the case of HIV/AIDS. The social diseases include mistrust and discrimination against HIV/AIDS victims that establish uncomplimentary distinction based on risk of disease transmission and moral impurity. In terms of morality, HIV/AIDS is seen as self-inflicted through promiscuity (UNESCO, 2003). The association of HIV/AIDS and promiscuity in turn leads to issues of morality such that HIV infection confirms one's sexual behaviour hence stigma. HIV/AIDS infection is in turn associated with secrecy surrounding sero-status. Moralisation of HIV status contributes to reluctance in finding out serological status leading to secrecy hence high HIV risk sexual encounters (Kilian et al., 1999).

There are other misconceptions about HIV/AIDS prevention. For example, the perception that condom users are either already sick or promiscuous and myths such as condoms are manufactured with holes so that people become infected. On the other hand, higher levels of education increase the feasibility of HIV control initiatives especially in regard to misconceptions (Blum & Mmari, 2005). Education provides adolescents with new sexual mores and increased knowledge of condom use and prevention of HIV infection (UNESCO, 2002). The HIV/AIDS knowledge gaps are wider among female adolescents than their corresponding males. Adolescent females are usually lowly educated hence poorly informed than their male counterparts (World Bank, 2002).

The mass media has been identified as an important pathway to education and behaviour change that shapes social norms and sexual behaviours. The transformation is prompted through ideation change – an alteration in a person’s way of thinking brought about via dispersal of new information and habits. Ideation adopts diffusion-of-innovation theory defining an inputs-outputs model. The ideation model suggests that different messages and approaches in communication are required to reach all populations (Gupta et al, 2003). Evidence in Uganda found that exposure to messages through various channels is considered the most effective way to change knowledge, attitudes and behaviours. Behaviour change communication campaigns should include a combination of radio sports, television advertisements; print materials, clinic based counselling, community activities and drama, theatre and group meetings.

Adolescents are particularly attuned to the mass media as a source of behaviour patterns, which consequently establishes mass media’s potential to disseminate HIV/AIDS messages to tackle misconceptions (Cornejo & Andina, 2007). Perceptions of risks and accurate ways to avoid risks are some of the knowledge gaps in HIV/AIDS prevention (Clark, 2006). For example, a World Bank (2002) study reported that HIV infected adult men seek out uninitiated girls as an AIDS curative measure. Another example is the fact that most married adolescents consider chances of contracting HIV/AIDS as none or small. A study on multimedia behaviour change communication (BCC) campaigns and contraceptive use in Uganda indicated that exposure to BCC messages is associated with increased condom use (Gupta et al, 2003).

Educated population discerns information from diverse sources (Cornejo & Andina, 2007). The enhanced discernment emanates from media's broadcast messages through a variety of channels to change knowledge, attitude and behaviour. These media channels include radio, television, newspapers, Internet, personal communication, schools, churches and community activities. Multimedia approach extends the reach of HIV/AIDS messages to a wider audience such as various socioeconomic, cultural and age groups. A study in Uganda indicates that multimedia exposure increases contraceptive use in the form of different messages and also because most people cannot afford all means of media communication at the same time. The various means of communication are popular with differing age groups hence expanded outreach (Gupta et al, 2003).

## **2.7 EDUCATION AND SEX DIFFERENTIALS**

The HIV/AIDS epidemic disproportionately affects women in Sub Saharan Africa. For instance, 57 percent of HIV infected adults are women. In 2005, 75 percent of all women with HIV/AIDS lived in SSA. Female adolescents are disproportionately infected than adolescent males (UNAIDS, 1998). Most of the blame on sex differentials in HIV/AIDS infections derives from social constructs of sex roles. The background factors that influence sexual behaviour exhibit varying results on males and females based on gender. Gender is socially defined and it means to be either male or female, which defines a person's opportunities, roles, responsibilities and relationships. These gender roles exert significant influence on having partners and HIV/AIDS transmission.

Female adolescents are vulnerable for demographic, cultural, socioeconomic and even psychosocial factors. Lack of education makes sex differentials in HIV prevalence obvious (WHO, 2006). Female adolescents are at greater risk because of cross-age and cross-class sexual partners, power and access to resources. Studies in 72 SSA capital cities showed significantly higher HIV infections among female adolescents in sites with large gaps in female-male literacy ratios (World Bank, 2002). For instance, evidence suggest that some cultural practices encourage adolescent females to accept older men as sexual partners hence the *sugar daddy syndrome* and customs like wife inheritance, which in turn encourage having multiple partners (Sengendo & Sekatawa, 1999).

However, some cultural norms such as insistence on marital sex can protect adolescent females from risk of HIV/AIDS infection (World Bank, 2002). These protective cultural practices are, however, offset with education induced liberal sexual mores. Therefore, there exists both positive and negative cultural tenets regarding sexual partners and HIV/AIDS spread (Sengendo & Sekatawa, 1999). The HIV/AIDS epidemic, on the other hand, reduces females' access to education (World Bank, 2002). Female are more likely than males to engage in domestic work due to AIDS deaths or home-based care for the sick. Consequently, HIV/AIDS further reduces females' already low education enrolment rates. For instance, in Africa, secondary school enrolments rates for girls are low, and male-female disparity in universities and collages is high in favour of males (cf. UNESCO, 2000).

Some studies in Sub Saharan Africa indicate that education system itself makes HIV/AIDS infection risk high among female adolescents (World Bank, 2002). For example, sexual abuse of school-age female adolescents is common in most SSA countries. A study in South Africa found that 40 – 47 percent of sexual assaults are perpetrated against female adolescents and that 30 percent of female adolescents report that their first sexual encounters were forced. In Uganda, 31 percent of adolescents reported teacher sexual abuse. Twenty percent of adolescent females reported male teachers' or relatives' sexual abuses in Nairobi, Kenya. Such unplanned and coerced sexual behaviours establish spontaneous multiple partners (World Bank, 2002).

## **2.8 SUMMARY OF LITERATURE REVIEW**

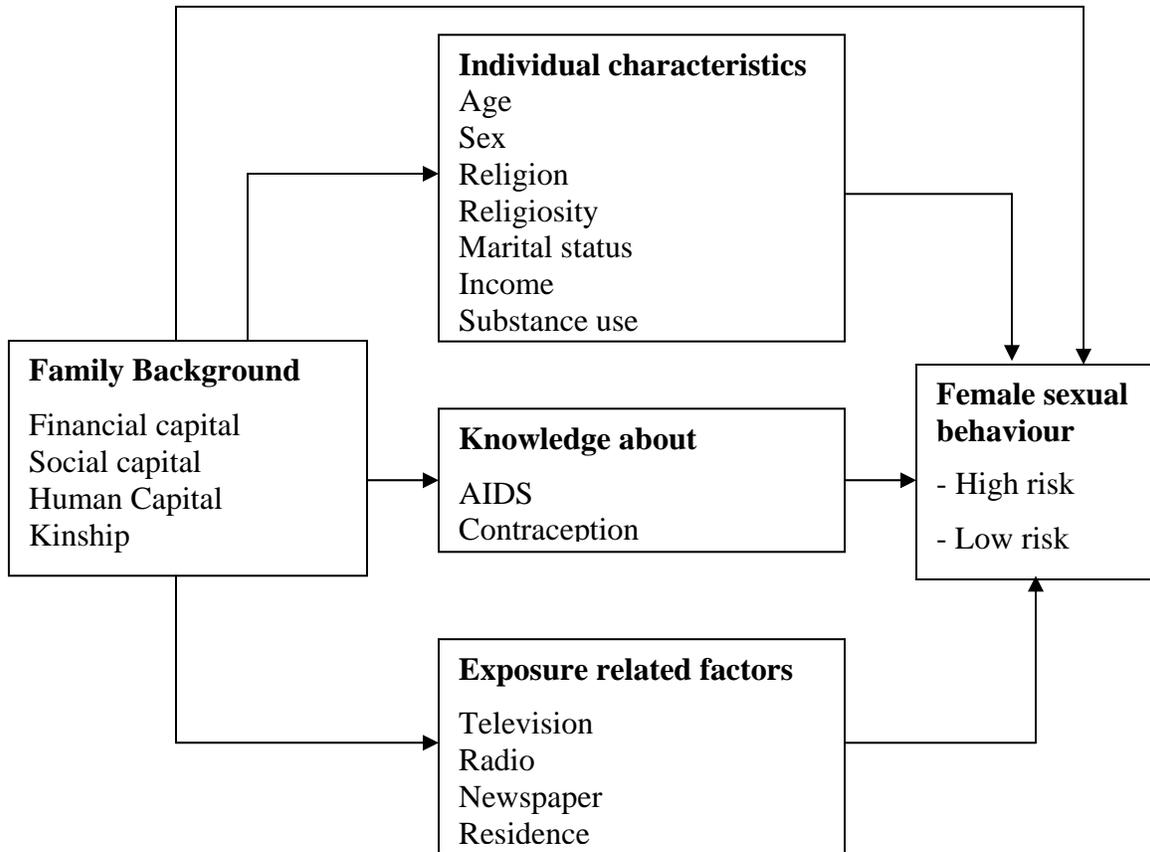
There has emerged a relationship between education and having multiple partners in literature. Other relationships have also been established that act as proxies for education and multiple partners association. These proxies include individual variables like religion, employment, media access and HIV/AIDS awareness. Education is also a socio-demographic indicator of development and gender status. Education is well placed to achieve the ultimate goal of decreasing HIV prevalence among adolescents. Education opportunities cover adolescents before and after initiation of sexual activity (Kirby et al, 2006). It provides access to information; equipment with HIV prevention skills; and increases health services accessibility. Education interventions are nonetheless scarce in

low-income settings such as SSA informal settlements, which explain the general high urban risk taking sexual encounters (Blum & Mmari, 2005).

The World Bank (2002) has argued that, initially, education prevents HIV/AIDS infection through health decisions, rational behaviours and prospects for economic liberty. Secondly, education reduces girls' vulnerability through female economic independence, delayed marriages, family planning, and social mobility. Thirdly, education provides a ready-made infrastructure and personnel for HIV/AIDS prevention efforts and dispensation. Finally, education is cost-effective as it brings together various age groups and sexes consequently restraining HIV/AIDS-related health overheads. Of particular interest are rational behaviours and healthy decisions in regard to having multiple sexual partners formations hence exposure to HIV infection.

## 2.9.1 CONCEPTUAL FRAMEWORK

FIGURE 2.1: CONCEPTUAL FRAMEWORK [SOURCE: DJAMBA (1997)]



## 2.9.2 CONCEPTUAL HYPOTHESES

Education is likely to influence social capital characteristic of adolescents hence HIV risk sexual behaviour.

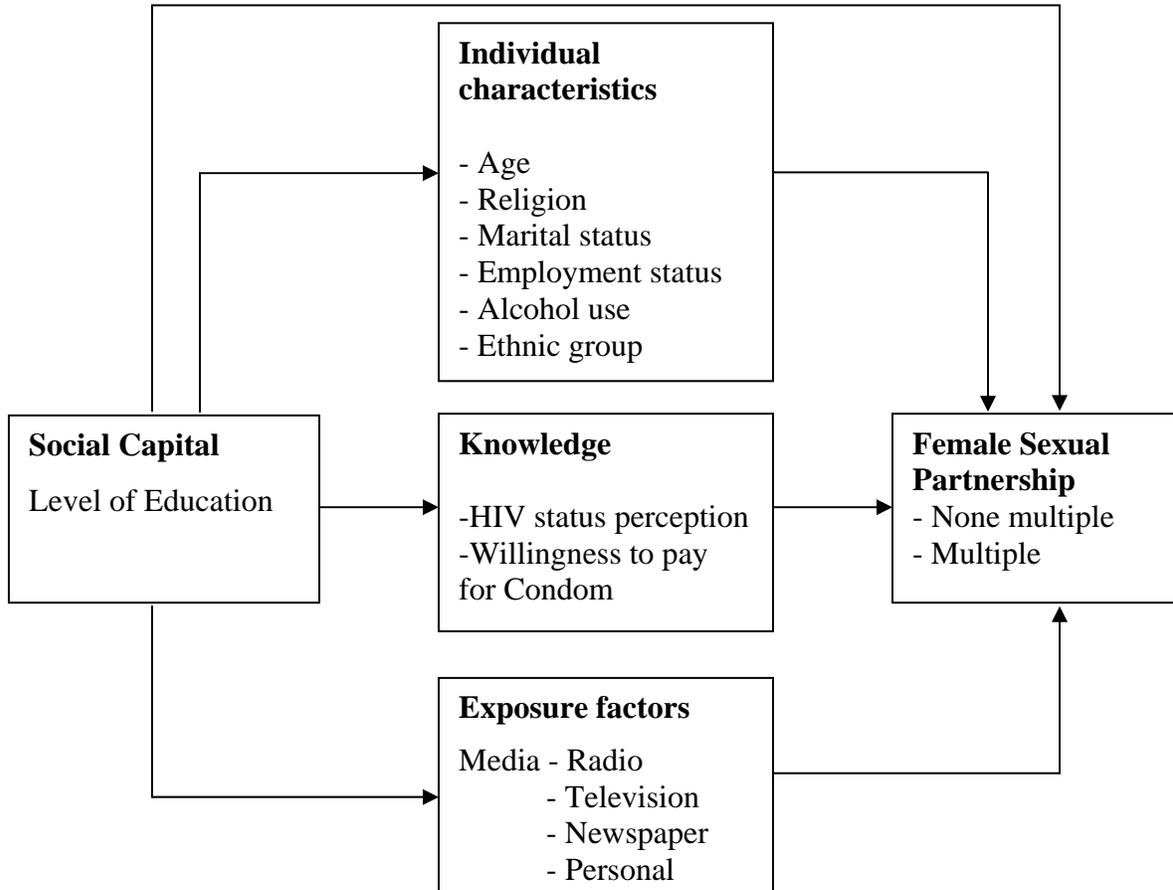
Education is likely to influence financial Capital characteristics of adolescents hence HIV risk sexual behaviour.

Education is likely to influence human capital characteristics of adolescent hence HIV risk sexual behaviour.

Education is likely to influence kinship characteristics of adolescents hence HIV risk sexual behaviour.

### 2.9.3 OPERATIONAL FRAMEWORK

FIGURE 2: OPERATIONAL FRAMEWORK [SOURCE: DJAMBA (1997)]



### 2.9.4 OPERATIONAL HYPOTHESES

a) Educated female adolescents are less likely to have multiple sexual partners than uneducated ones.

Education is the main explanatory variable and is posited to play an integral role in the risk of having multiple sexual partners. Education is modelled on sexual partners while controlling for individual traits, HIV/AIDS knowledge and exposure factors (i.e. demographic: age and marital status; economic: work status and willingness to pay for condoms; cultural: ethnicity and religion; psychosocial: alcohol use and perception of HIV status; and multimedia access to HIV/AIDS information: radio, television, newspapers, churches and mosques, and schools and teachers

Secondary hypotheses would thus be:

i) Marital status and age partially account for the effects of education on the risk of having multiple sexual partners.

ii) Work status and willingness to pay for condoms partially account for the effects of education on the risk of having multiple sexual partners.

iii) Ethnicity and religion partially account for the effects of education on the risk of having multiple sexual partners.

iv) HIV status perception and alcohol use partially account for the effects of education on the risk of having multiple sexual partners.

v) Multimedia access (radio, television, newspapers, churches and schools) partially account for the effects of education on the risk of having multiple sexual partners.

### **2.9.5 DEFINITION OF KEY VARIABLES**

i). **Marriage:** in this study, marriage will be used to refer to any union between a man and a woman regardless of the legality of the union

ii) **Age:** refers to an adolescent's number of years lived since birth and ranges from 12 – 24 in this study.

iii) **Religion:** Religion is any specific system of belief about deity, often involving rituals, a code of ethics, a philosophy of life, and a worldview, which is a set of basic foundational beliefs concerning deity, humanity and the rest of the universe

v) **Education:** the gradual process of acquiring knowledge in an institutional environment usually divided into stages such as nursery, primary, secondary, etc. in this study formal education is in terms of levels of education – primary, secondary and tertiary – will be used.

vi) **Sexual behaviour:** refers to sexual activity scores developed from adolescents' reports of number of sexual partners in the twelve month period preceding the survey; and sexual partnerships is divided into i) Multiple sexual partners; and ii) Non-multiple sexual partners.

**HIV/AIDS:** HIV refers to a virus that attacks the human immune system rendering it vulnerable to attacks from other diseases, while AIDS is an acronym that stands for Acquired Immune Deficiency Syndrome.

TABLE 2.1: SUMMERY OF VARIABLES AND THEIR MEASUREMENTS

NAME	MEASUREMENT	TYPE OF VARIABLE
<b>Sexual partnership</b>	0 = Non-multiple partners (RC)	Dependent
	1 = Multiple partners	
<b>Education</b>	0 = No education (RC)	Main Independent
	1 = Primary	
	2 = Secondary	
	3 = Higher	
<b>1. Marital status</b>	1 = Formerly married (RC)	Control
	2 = Live with partner	
	3 = None	
<b>2. Employment status</b>	1 = Employed (RC)	
	2 = Unemployed	
<b>3. Religion</b>	1 = Roman Catholic (RC)	
	2 = Protestant/other Christians	
	3 = Muslim	
	4 = No religion	
	5 = Other	
<b>4. Age of respondent</b>	1 = 12 – 14 (RC)	
	2 = 15 – 19	
	3 = 20 – 24	
<b>5. Payment for Condom</b>	0 = willing (RC)	
	2 = Unwilling	
<b>6. Alcohol use</b>	0 = Ever used alcohol (RC)	
	2 = Never used alcohol	
<b>7. Exposure to media</b>	1= Radio (RC)	
	2 = Television	
	3 = Newspapers	
	4 = Mosques & Churches	
	5 = Schools & teachers.	
<b>8. HIV status perception</b>	1 = Cant tell (RC)	
	2 = Cannot tell	
	Don't know	
<b>9. Ethnicity</b>	1 = Kamba (RC)	
	2 = Kikuyu	
	3 = Luo	
	4 = Luhya	
	5 = Others	

KEY: RC = Reference Category

## **CHAPTER THREE**

### **DATA AND METHODOLOGY**

#### **3.1. INTRODUCTION**

This chapter reviews sources of data used for analysis in this study. Data is from African Population and Health Research Centre (APHRC), which specialises on urban health and demographics in Africa. The APHRC study instruments are modelled on KDHS questionnaires. APHRC also developed a specific instrument for the adolescent population, which had questions on sexual behaviour among others. In addition, this chapter includes data quality and analytical methods employed such as frequency distributions, cross tabulations, chi-square ( $\chi^2$ ) and multiple logistic regression models.

#### **3.2.0 DATA SOURCES**

##### **3.2.1 STUDY DESIGN**

The present study uses data drawn from *Population and Health Dynamics in Nairobi's Informal Settlements* popularly known as Nairobi Cross-Sectional Slum Survey (NCSS, 2002). The design was based on enumeration areas of the 1999 Census. The survey designed a weighted cross-sectional sample representative of all informal settlement clusters in Nairobi. A two-staged design was used to select enumeration areas at the first stage of sampling while in the second stage, households were selected from enumeration areas sampled at the first stage (APHRC, 2002). The design generated a sampling frame from all households' listings for Nairobi province from 1999 census. The listing provided names of locations, sub-locations, enumeration areas as well as structure numbers and owners, number of dwelling units and use of structures.

NCSS is representative of households in clusters identified in collaboration with Kenya Central Bureau of Statistics (CBS) as informal settlements. Sample size determination relied on relative size (proportional sampling) of each settlement. Eighteen administrative locations in Nairobi city existed as informal settlements communities in 1989. The sampling implementation was, however, developed on the basis of a sampling frame using household listings of 1999 census in which there were 45 administrative locations in 1999 and 31 of these locations contained at least one cluster designated as an informal settlement (APHRC, 2002).

Household questionnaire was administered in sampled dwelling units to identify individuals eligible for individual interviews. The study considered as eligible all female household members who slept in the dwelling unit the previous night and aged 12 – 49 years and all male members and visitors aged 12 – 24 years old were eligible for interviews. The survey interviewed 4564 households, 3256 women of reproductive age groups (15 – 49), and 1683 adolescent males. The 1934 adolescent females interviewed comprised 316 aged 12 – 14 years and 1618 aged 15 – 24 age years. However, this study uses 1148 female adolescent respondents who reported their number of sexual partners.

### **3.2.2 SURVEY INSTRUMENTS**

The NCSS instruments were modified from Kenya Demographic and Health Survey (KDHS) instruments. The core sections of 1998 KDHS were replicated without revision; nevertheless, service delivery exposure questions were modified for improved relevance to an urban context. APHRC (2002) noted that NCSS similarity with national, urban, rural and Nairobi city results in 1998 KDHS was to allow for comparison. NCSS used three survey instruments: household schedule and individual women schedule. Lastly, an adolescents' schedule was also included to generate information on HIV/AIDS and other sexually transmitted infections (STIs), and general health matters of specific relevance in informal settlements (APHRC, 2002).

### **3.3.0 DATA QUALITY**

The NCSS design was intended to provide and generate high quality data on the model of KDHS. The design envisaged limiting sampling errors together with non-sampling errors. Non-sampling errors have been described as mistakes made during field data collection. For example, failure to locate and interview sampled individuals, errors in ways questions are asked, misunderstanding of questions on the part of respondents and data entry errors. APHRC attempted to control non-sampling errors but which are, nonetheless, generally impossible to eliminate and evaluate statistically. This section reviews possible sex and age reporting errors among the adolescent sample that has been used for analysis in the present study.

### **3.3.1 RESPONSE BIAS AND SEX**

Data quality on sexual behaviour particularly on premarital and extramarital sexual intercourse, typically suffers from response biases such as underreporting. Such underreporting especially applies to female adolescents (Zulu et al, 2002). Data collection on adolescents generally shows that male adolescents report much higher levels of sexual activity than female adolescents do. In addition, married female adolescents tend to hide their extramarital sexual partners. For example, KDHS data greatly underestimate sexual activity among adolescents. Since the NCSS is modelled on KDHS study instruments, it could be assumed that same underestimation occurs with respect to female adolescents' responses in relation to having extramarital sexual partners.

### **3.3.2 CONCEPTS AND TYPES OF AGE ERRORS**

Errors in age reporting are at times readily apparent. There are various types of errors such as coverage, failure to record and misreporting of ages. Coverage errors are gross under-enumeration – individual adolescents missed in the survey, and net under-enumeration – other age groups erroneously included. There are also response biases in age reporting. Some adolescents' ages may have been left out or erroneously reported by respondents or enumeration officers. Digit preference is another form of error in age reporting. For instance, there tends to be a clustering around ages ending with “0” (zero), “5” (five), and even numbers and corresponding deficiencies in ages ending in “1” (one).

Age reporting errors can be corrected in post-enumeration surveys or samples re-interview studies. A tendency has also been reported of types of age errors to offset one another depending on nature and magnitude of errors and grouping of data. In the case of age reporting, the female underreporting and male over reporting cancel out. However, sex based analyses would be compromised; and also, this study has excluded male adolescents. The implication of age misreporting is that female adolescents above 24 years could have been included in analysis (Shryock et al, 1976). The present study did not re-interview adolescents nor engaged in any post-enumeration to ascertain the ages.

Nonetheless, HIV/AIDS poses the greatest threat to the adolescent population together with the general population. At the same time, education provides a window of hope to influence sexual health and control HIV/AIDS infections among adolescents. The

study on influence of education on multiple sexual partnerships is therefore crucial in identifying opportunities and restructuring negative attitudes and misconceptions for action to help stem the present tide of HIV/AIDS prevalence among adolescents.

### **3.5. DATA ANALYSIS METHODS**

#### **3.5.1 FREQUENCY DISTRIBUTIONS AND CROSS TABULATIONS**

The unit of analysis in this study is a representative sample of 1,148 female adolescents. A descriptive distribution of the adolescent population provided the opportunity for comparisons of individual and background determining factors. Various statistical tools have moreover been employed to interpret associations and test statistical significance. Such tools include frequency distributions, which show values and distributions of background variables and cross tabulation. Frequencies were used to indicate distribution of background factors. Cross tabulations provided relationships and distributions of variables. Cross tabulation was used to establish the nature of associations while chi-square was used to establish the nature of the relationships.

#### **3.5.2 LOGISTIC MULTIVARIATE ANALYSIS**

Multivariate logistic regression models for binary dependent variables were applied using the Statistical Package for Social Scientist (SPSS). The assumption of the regression model was that individual observations are independent. In addition to levels of education, a number of socio-demographic variables were included as potential control variables: respondent's age, marital status (both formal and consensual unions), religion, HIV status perception, media access, willingness to pay for condoms, ethnicity and employment status. The measure of sexual partners was constructed in terms of multiple and non-multiple partners – those without partners and those with one sexual partner were categorised as non-multiple sexual partnerships and those with more than one sexual partner as multiple sexual partnerships.

## **CHAPTER FOUR**

### **FINDINGS OF THE STUDY**

#### **4.1 INTRODUCTION**

This chapter presents descriptions of the background characteristics of the female adolescents as well as bivariate analysis. It also contains analysis and discussions on the findings of models used to explain the association of education and risk of having multiple sexual partners. The analysis is based on a sample of 1,148 female adolescents aged 12 – 24 years who responded to the question on number of sexual partners in a prior twelve months period. Sexual behaviour in this study refers to the number of partners, which is classified into non-multiple sexual partners and multiple sexual partners while education is the main explanatory variable in addition to other control variables.

#### **4.2 BASIC CHARACTERISTICS OF THE STUDY POPULATION**

The data are described in table 4.1. The distributions of outcome variable, main independent and control variables are presented together. The analyses in this study exclude missing cases in the data. Approximately 35 percent of respondents reported not only having had sexual intercourse, but multiple sexual partners within the last twelve months before the survey. Most of the respondents reported primary and secondary education while a majority – 42 percent – of the respondents were aged 15 – 19 years, 26.3 percent were aged 12 – 14 years and 31.4 percent were aged 20 – 24 years. Besides, approximately 95.2 percent of the respondents were neither married nor had partners as at the time of the survey, which indicates low rate of marriage or separation but high rates of partner change as most of the respondents had gotten at least a partner before.

Besides, about 65 percent of the respondents reported unwillingness to pay for condoms; and on average, about 72 percent of respondents were not working, which may lead to transactional sexual partners. The respondents also reflected communities where most residents were Protestants; most of the respondents had never drunk alcohol; and 22.3 percent of the respondents believed that they could tell if a person was HIV positive. The adolescents lived in communities where 29 percent of respondents were Kikuyu followed with the Luo. The results also show that most of the respondents reported radio and television as crucial sources of HIV/AIDS information in the informal settlements.

TABLE 4.1: DISTRIBUTION OF BACKGROUND CHARACTERISTICS

CHARACTERISTICS	CASES	PERCENTAGES
<b>Sexual partners</b>		
None multiple partnerships	749	65.2
Multiple sexual partnerships	399	34.8
<b>Educational level</b>		
No education	25	2.2
Primary	807	71.9
Secondary	293	26.1
Higher	23	2.0
<b>Age of respondent</b>		
12 – 15 years	302	26.3
16 – 19 years	485	42.2
20 – 24 years	361	31.4
<b>Ever been married</b>		
Formerly married	43	3.8
Live with a partner	11	1.0
None	361	95.2
<b>Religion</b>		
Catholic	377	32.9
Protestant	694	60.5
Muslim	68	5.9
No religion	6	0.5
Other	2	0.2
<b>Working status</b>		
Currently working	530	28.0
Currently not working	1404	72.0
<b>Drunk alcohol</b>		
Ever drunk alcohol	85	18.7
Never drunk alcohol	1549	81.3
<b>Willing to pay for Condom</b>		
Willing	175	34.9
Unwilling	327	65.1
<b>Ethnicity</b>		
Kamba	155	13.5
Kikuyu	333	29.0
Luhya	232	20.2
Luo	289	25.2
Other	139	12.1
<b>Media</b>		
Radio	76	27
Television	26	9.3
Newspapers	29	7.4
Churches & Mosques	18	6.5
Schools & teachers	31	11.1

### 4.3 BIVARIATE ANALYSIS

Figure 4.2 summarises the results of bivariate analysis of indicator variables and having multiple partners. The results show that most respondents who had multiple partners were those who had primary education as well. For instance, respondents with primary education formed 22.7 percent of those having multiple partners while 11.4 percent of those with secondary education also had multiple partners. The results, furthermore, show that most of the respondents with multiple partners were 20 –24 year olds. Besides, a majority of respondents with multiple partners were those who were neither married nor living with partners as at the time of the survey despite the fact that they were at the same time having multiple partners. Asked whether the respondents were working or not, a majority of those having multiple partners indicated that they were unemployed as at the time of survey.

The respondents were asked their ethnic backgrounds and the distribution of respondents by ethnic settings shows that most of the respondents having multiple partners came from the Luo community. The result suggests that the Luo were the most likely to have more than one sexual partner compared to other ethnic communities in the informal settlements. The implication could be that ethnicity plays a role in having multiple partners as those respondents are still tied to cultural practices regarding partner formation. The survey sought religious affiliation and most of the respondents having multiple partners reported that they were Protestants. The previous use of alcohol among the respondents results indicate that most of the adolescents having multiple partners had ever used alcohol at some point before the survey. The results may indicate that alcohol use is associated with having multiple partners.

The respondents were asked whether they could tell an HIV positive person. The results indicate that most adolescents having multiple partners also indicated that they could not tell the HIV status of a person. In fact, about 27.4 percent of the respondents having multiple partners reported that they also could not tell if a person was HIV positive. Reports on sources of HIV/AIDS information indicate that roughly 27.3 percent of the respondents having multiple partners had heard of HIV/AIDS information from radio and 10.8 percent from schools and teachers. Radio and schools and teachers were therefore reported as crucial sources of HIV/AIDS information hence having partners.

TABLE 4.2: SEXUAL PARTNERSHIPS AND INDIVIDUAL CHARACTERISTICS

Characteristics	Non-multiple (%)	Multiple (%)	Total (%)
<b>Education</b>			
None	0.4	1.7	2.2
Primary	22.7	47.6	70.3
Secondary	11.4	14.1	25.5
Higher	0.3	1.8	2.0
$\chi = 24.165, df = 3, sign. = 0.000$			
<b>Age</b>			
12 – 14	1.2	25.1	26.3
15 – 19	15.2	27.1	42.2
20 – 20	18.4	13.1	31.4
$\chi = 210.46, df = 2, sign. = 0.000$			
<b>Marital status</b>			
Formerly	3.0	0.8	3.8
In union	0.8	0.2	1.0
Neither	31.2	64.	95.2
$\chi = 49.546, df = 2, sign. = 0.000$			
<b>Condom payment</b>			
Willing to pay	28.5	6.4	34.9
Unwilling to pay	51.0	14.1	65.1
$\chi = 0.821, df = 1, sign. = 0.365$			
<b>Work status</b>			
Working	13.3	14.7	28
Not working	21.4	50.5	72
$\chi = 32.130, df = 1, sign. = 0.000$			
<b>Ethnic group</b>			
Kikuyu	8.9	20.1	13.5
Luo	9.2	15.9	29.0
Luhya	7.2	13.0	20.2
Kamba	6.3	7.2	25.2
$\chi = 17.235, df = 4, sign. = 0.002$			
<b>Religion</b>			
Catholic	13.1	19.8	32.9
Protestant	20.2	40.3	60.5
Muslim	1.2	4.7	5.9
No religion	0.3	0.3	0.5
Other	0.0	0.2	0.2
$\chi = 12.442, df = 4, sign. = 0.014$			
<b>Alcohol use</b>			
Ever use	11.7	7.1	18.7
Never use	23.1	58.2	81.3
$\chi = 88.459, df = 1, sign. = 0.000$			
<b>HIV detection</b>			
True	7.2	15.1	22.3
False	27.4	44.9	72.3
Don't know	0.2	5.2	5.4
$\chi = 31.431, df = 2, sign. = 0.000$			
<b>Sources of information</b>			
Radio	45.4	27.3	72.8
Television	17.6	10.3	28.0
Newspapers	13.2	8.3	21.5
Mosques & Churches	11.0	6.3	17.3
Schools & teachers	31.7	10.8	42.6

There is evidence to suggest that having multiple partners are low among those with high levels of education especially females. For example, a study by Kirby and colleagues (2006) found that education reduces the risk of having multiple partners among females. Education is also associated with age, as the youngest adolescents are most probably in lower levels of education where most of them have not initiated sexual activity. For instance, most adolescents who reported having multiple partners were the 20 – 24 year olds. The association of marital status and having multiple partners indicate that most adolescents having multiple partners were neither married nor living with partners at the time of the survey.

Studies have also revealed that unsafe sex is common in marriages and other consensual unions. For example, a study in Uganda indicated that female adolescents were exposed to high-risk sexual encounters as a result of their partners' sexual behaviours and therefore similarly exposed to HIV infection (Clark, 2004). Equally, single women have been noted to have multiple sexual partners for various reasons. One such common reason is that women with multiple sexual partners engage in poverty driven transactional sex especially after marital break-ups or separations and most of such female adolescents end up residing in equally poor informal settlements hence a dangerous circle of risky sexual behaviour and multiple partners (Zulu et al, 2002).

Longfield and colleagues (2004) investigated cross-generational sexual partnerships and reported that one of the motivating factors was poverty and lack of basic needs. Sources of income such as employment would therefore significantly reduce economically motivated multiple sexual partners. The study found that, 72 percent of respondents were unemployed in the twelve-month period prior to the survey out of which 21.4 percent were having multiple sexual partners. The low employment levels in informal settlements thus expose female adolescents to increased risks of HIV infection through poverty driven transactional multiple sexual partnerships (Zulu et al, 2002).

The study found ethnicity significantly associated with having multiple sexual partners. Having multiple sexual partners partly varies due to culturally sanctioned sexual frameworks. One such culturally accepted increased sexual activity is in the context of marriage and desire for children as soon as couples settle for marriage. Marital sexual activity and high fertility demands have been noted to expose female adolescents to high

partner turnover and multiple partners and high chances of HIV infection (Sengendo & Sekatawa, 1999). Related to ethnicity is religious background. For example, Reynolds (1994) observed that the religious assumption that sexual encounters are consensual and occur within marriages is similar to cultural practices in many societies. However, there exists non-marital and multiple sexual partners among adherents of various religions.

Mugisha and colleagues (2003) investigated association of substance use and sexual behaviour among adolescents. The study reported positive association between alcohol use and sexual networking and risk of HIV infection. The positive associations arose due to poor judgement; coercive sex and lack of condom use during sex both with marital and non-marital partners. The findings indicate that of the 34.8 percent of respondents having multiple sexual partners, 11.7 percent had ever used alcohol as opposed to 23.1 percent who had never used alcohol prior to the survey. The association between alcohol use and having multiple sexual partners is significant, which increases the chances of those in sexual networks and consuming alcohol catching the AIDS virus.

The association between media sources of HIV/AIDS information and having multiple sexual partners reflected that 27.3 percent, 10.3 percent, 8.3 percent, 6.3 percent and 10.8 percent of HIV/AIDS information came through radio, television, newspapers, mosques and churches, and schools and teachers respectively. Evidence suggests that there is an association between multimedia access to HIV/AIDS information and high HIV risk sexual behaviours. For example, Bertrand and Rebecca (2006) investigated effectiveness of mass media in changing HIV/AIDS related behaviour among young people in developing countries and reported that multimedia access has positive effects on skills, knowledge about health services and social norms.

Gupta and colleagues (2003), in a study in Uganda, reported that the use of multimedia HIV/AIDS information is considered the most effective way of changing knowledge, attitudes and practices (KAP). However, this study found low access to HIV/AIDS information from most media channels except radio. The low access could be attributed to illiteracy hence poverty, which determines the types of gadgets available to most of the respondents in informal settlements. The implication of low media access to HIV/AIDS information to adolescents thus contributes to increased exposure to lack of appropriate techniques to reduce having multiple partners and risk of HIV infections.

#### **4.4 DETERMINANTS OF ADOLESCENCE SEXUAL PARTNERSHIPS**

The outcome variable is having multiple sexual partners among female adolescent population in informal settlements of Nairobi. The outcome variable is binary: non-multiple sexual partners or multiple sexual partners. The variable is represented as: 0 = non-multiple sexual partners, and 1 = multiple sexual partners. Sexual partners are derived from information on the number of sexual partners during a twelve-month period preceding the survey. As indicated above, the main explanatory variable is education. The others are control variables and include demographic, economic, psychosocial and cultural factors and media access, which have been employed to examine how they account for the influence of education on the risk of having multiple sexual partners.

The odds for adolescents having had multiple sexual partners in the previous twelve months is described in table 4.3 below. Model 1 shows gross effect of adolescent education on the risk of having multiple sexual partners in informal settlements. The model indicates that the odds of adolescents with secondary education having had multiple sexual partners in the twelve months period is 3.26 times higher than that of the reference category. No other category is statistically significant. However, the odds of the adolescents with primary education having had multiple partners are almost 2 times higher than that of adolescents with no education. Model 1 moreover shows that adolescents with higher education are 0.38 times less likely to have had multiple sexual partners in the previous twelve-month period compared to reference category.

The addition of demographic variables (see model 2) significantly shifts the odds of having had multiple sexual partners in the twelve months before the survey for all categories downwards. The higher category is found significant. The odds of adolescents with higher education having had multiple partners are 0.07 times lower than that of adolescents with no education. Nonetheless, adolescents with primary education are 1.33 times more likely to have had multiple sexual partners in comparison to the reference category while adolescents with secondary education are 0.92 times less likely to have multiple sexual partners in reference to no education category. Secondary category witnessed 2.34 times reduction in the risk of having multiple sexual partners. The changes observed in model 2 imply that demographic variables such as marriage and age partially account for the effect of education on the risk of having multiple partners.

TABLE 4.3: EDUCATION AND RISK OF MULTIPLE SEXUAL PARTNERSHIPS

<b>Adolescent education</b>	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>	<b>Model 5</b>	<b>Model 6</b>
<b>Education</b>						
No education (Ref)	1.00	1.00	1.00	1.00	1.00	1.00
Primary education	1.91	1.33	0.99	0.99	1.13	1.20
Secondary education	3.26*	0.92	0.78	0.77	0.92	1.01
Higher education	0.38	0.07*	0.03*	0.03*	0.04*	0.04*
<b>Age</b>						
12 – 14 years (Ref)		1.00	1.00	1.00	1.00	1.00
15 – 19 years		12.26*	0.39	0.40	0.39	0.40
20 – 24 years		37.62*	0.43	0.46	0.44	0.43
<b>Marital Status</b>						
Formerly married (Ref)		1.00	1.00	1.00	1.00	1.00
Lived with partner		1.34	1.27	1.42	1.41	1.26
No marriage or partner		0.36*	1.45	1.50	1.55	1.59
<b>Pay for condoms</b>						
Willing to pay (Ref)			1.00	1.00	1.00	1.00
Unwilling to pay			0.58	0.58	0.58	0.58
<b>Work status</b>						
Working (Ref)			1.00	1.00	1.00	1.00
Not working			0.93	0.88	0.89	0.85
<b>Religion</b>						
Catholic (Ref)				1.00	1.00	1.00
Protestant				0.72	0.73	0.70
Muslim				1.89	1.92	1.56
Other				0.59	0.59	0.53
<b>Ethnicity</b>						
Kamba (Ref)				1.00	1.00	1.00
Kikuyu				0.47	0.46	0.47
Luhya				0.60	0.60	0.61
Luo				0.79	0.79	0.83
Others				0.37	0.38	0.44
<b>Tell HIV status</b>						
True (Ref)					1.00	1.00
False					1.15	1.20
Don't know					3.1E+08	2.9+08
<b>Ever drunk alcohol</b>						
Ever use (Ref)					1.00	1.00
Never use					0.87	0.82
<b>Media access</b>						
Radio						0.86
Television						1.02
Newspapers						1.15
School & teachers						1.44
Churches & mosques						1.96
Ref = reference category; *p < 0.05.						

Note: Tables of full logistic regressions results are provided in the appendix.

The addition of economic factors such as employment and willingness to pay for condoms in model 3 marginally reduces the risk of having multiple sexual partners for primary and secondary categories, while higher category remains unchanged. The risk of having multiple sexual partners for adolescents with primary education reduces by 34 percent while that of adolescents with secondary education reduces by 14 percent. The risk of having multiple sexual partners for higher category remains the only significant category. Results indicate that economic variables account for some of the risk of having multiple sexual partners among female adolescents. The implication may be that equal economic prospects would erode some of the linkages of the risk of having multiple sexual partners to education. It is interesting to note that the risk of having multiple sexual partners in model 3, nonetheless, reduces with increasing levels of education.

Accounting for cultural variables (as reflected in model 4) indicates no changes in the risk of having multiple sexual partners. The results may indicate that culture does not account for the effects of education on the risk of having multiple sexual partners. Thus, cultural practices that accompany rural-urban migrants do not influence the risk of having multiple partners. The results contradict evidence in literature, which indicates that culture accounts for having multiple partners. On the other hand, there is evidence to indicate that education liberalises sexual mores in societies, which results in hitherto forbidden sexual behaviours. Cultural practices are also multi-directional. For instance, some practices only restrict having non-marital partners among females. Education thus equally sets such female adolescents free, which would therefore results in increased risks of having multiple sexual partners (Sengendo & Sekatawa, 1999).

Inclusion of psychosocial factors (in model 5) indicates marginal increases in the risk of having multiple sexual partners for primary and secondary categories. For example, the odds of having multiple sexual partners in the twelve month prior to the survey for adolescents with primary education is 1.3 times greater than the reference category while adolescents with secondary education are 0.92 times less likely to have multiple sexual partners than the reference category. The risk of having multiple sexual partners for higher education is the only significant category. However, available evidence suggests that alcohol use increases the risk of having multiple sexual partners

and that perceived HIV/AIDS status may also influence the risk of having multiple partners in informal settlements (Mugisha et al, 2003; Mugisha and Zulu, 2004).

In model 6, the addition of multimedia access to HIV/AIDS information results in marginal increases in the risk of having multiple partners. For instance, the odds of adolescents with primary education having multiple partners are 1.2 times higher than the reference category while the odds of adolescents with secondary education having multiple partners are 1.01 times greater than adolescents with no education. The odds for higher category remains unchanged, and in fact still the lowest and significant among all categories. The findings may indicate that media access to HIV/AIDS information accounts for some of the effects of education on the increased risk of having multiple partners. However, studies indicate that access multimedia information is a crucial tool in HIV/AIDS awareness and access to skills and health services therefore contributes to decreases in risky sexual behaviour and HIV prevalence (Bertrand & Rebecca, 2004).

#### **4.5 DISCUSSION OF FINDINGS**

Some studies have considered adolescents as a uniform set. However, that is far from the truth. The situation is even more imprecise in regard to age margins of suggested adolescence phases. For example, it is difficult to establish where the three phases of adolescence begin and end. Besides, adolescence is a period of heightened physical, cognitive and emotional organisation, feelings of intimacy and interest in occupation choices. For instance, early adolescence is parallel with trials in social contact and concern for the now and here. Sexual encounters in this phase are self-conscious whereas having sexual partners are short lived. However, middle adolescence has mixed-sex peer groupings besides issues of career goals and at times despair. Sexual attraction takes centre stage as well as partner change and multiple partners. Late adolescence, at last, is a period of partnering or marriage – usually purposeful partners (WHO, 2004).

Several challenges surround measurement of sexual partners as all at once, having multiple and casual partners have been positively linked to the risk of HIV/AIDS infection (Blum & Mmari, 2005). Evidence suggests that some educated women have more partners than uneducated ones. Then again, divorced, widowed and never married women are more likely than married ones to have multiple partners (Zulu et al, 2002),

which then links education to marriage delay, separation, divorce and generally, having sexual partners. The findings show that adolescents with secondary education are the most likely to have multiple partners considering gross effects of education than all categories. Several factors have been proposed to explain the high risk of having multiple partners in middle adolescence or what may be parallel to secondary category.

As noted earlier, secondary category is a period of upsurge in partner change, marriages, cross-generational partners and mixed-sex peer groupings (WHO, 2004). In concert, 15 – 19 year olds usually fall in secondary category. For this study, it is possible that a majority of adolescents in secondary category were of middle adolescence hence high risk of having multiple partners considering gross effects of education (Jejeebhoy & Sebastian, 2003). Female adolescents also experience coercive sexual partners, which are non-consensual. For example, a study reported that 40 percent of adolescents in Uganda had ever been forced into sexual intercourse. In addition, most adolescents who left secondary school earlier might have missed out on school based sex education or are probably out of compensated work (Herrera & Camoero, 2003).

These findings are inconsistent with literature-based evidence, which suggest increasing risks of having multiple partners for decreasing levels of education. The less risk of having multiple sexual partners for base category in comparison to primary and secondary categories deviates from established evidence in literature, which suggests increased likelihood of having multiple partners for those with lower levels of education (World Bank, 2002). The findings may indicate that older adolescents with secondary education face heightened risk of having multiple partners due to school environments and exposure to pornographic sex information from media; and also economically driven habit of having multiple partners (sugar daddies) in secondary school (WHO, 2006).

Additional questions on levels of education and performance in school still remain. The type of school attended and grades attained in school or college as well as completion of stated levels of education are not apparent in this study. For example, the high risk of having multiple partners reported for adolescents with secondary education suggests lesser partners for adolescents with primary and no education considering gross effects of education. Even though results show high risk of having multiple partners, little is known about long-term gross effects of secondary education on risk of having multiple

partners. Whether the reported levels of education were completed, for respondents still in school, or for school dropouts is difficult to establish. Besides, secondary school adolescents are the greatest victims of *sugar daddy syndrome* (Longfield et al, 2004).

The source of data i.e. NCSS, relied on self-reporting – selective misreporting may lead to either understating or overstating of sexual partners. The differences encountered in establishing accuracy of reporting on questions on sexual partners i.e. multiple or non-multiple partners, are difficult to identify and would thus require further research. Nevertheless, it takes substantial misreporting of sexual partners in magnitude and divergence in order to evade statistical tools (Clark, 2004). Self-reporting coupled with conscious underreporting of sexual partners may therefore, challenge hitherto expected falling risk of having multiple sexual partners with rising levels of education reported in other studies (World Bank, 2002; UNESCO, 2003).

The crucial factor may be cross-sectional nature of NCSS – education could have a causal link or is merely allied to the risk of having multiple partners; besides, selection of control variables cannot be established with desired satisfaction. For example, even though the risk of having multiple partners and education may be associated, especially after controlling for observable factors, having non-multiple partners may also differ from having multiple sexual partners due to unobservable, however, causal qualities. Moreover, frequent partner change might not be wilfully reported as having multiple partners even though it may all also be associated with levels of education as in the case of sugar daddy affairs and other hasty partner encounters (Longfield et al, 2004).

There are other restrictions with NCSS data. Research methods indications are that cross-sectional data avert longitudinal advance to the analysis of the risk of having multiple partners. The implications are that cross-sectional analyses are vital in sorting out sexual networking while lacking in the determination of the processes that contribute to crucial reasons for having multiple partners and how partners evolve over time. For example, the transition to marriage in some communities is long and takes indefinite patterns especially in urban centres, some of which may allow for high sexual partner turnover. Nevertheless, partner turnover is a practice that may evade deliberation as having multiple sexual partners. The crucial challenge thus lies in premarital sexual activity and cohabitation or courtship as is contemporary (Clark, 2004).

The above results indicate that the risk of having multiple partners for all categories are statistically insignificant for gross effects except for secondary education, which at the same time registers highest risk of having multiple partners hence opposing available evidence. Studies indicate that increasing levels of education are always allied to falling risks of having multiple partners (Clark, 2004). Yet, addition of age and marital status variables makes higher category statistically significant. Model 2 also indicates reductions in the risks estimates for all categories. It may mean that higher category corresponds to late adolescence hence steady partners and marriage delays, which reduce the exposure to risk of having multiple partners in adolescence (McIntyre, 2006).

As a whole, findings in model 2 are consistent with other studies, which indicate that education delays timing of entries into sexual unions and is as well associated with age groups. For example, Bongaarts and Cohen (1998) reported that better educated adolescents delayed marriages and onset of sexual unions, which encourages the habit of having stable partners once formed. Findings confirm that age and marital status account for some of the effects of education to reduce risks of having multiple partners. Indeed, higher category has the lowest risk of having multiple partners (Blum & Mmari, 2005).

The addition of economic factors retains risk of having multiple partners on a downward trend. The marginal changes in risk of having multiple partners may mean that enhanced employment and improved purchasing power account for some of the effects of education on the risk of having multiple partners. Studies have shown that most women in sexual concurrency lack compensated work or are employed in low paying jobs such as receptionists, messengers or cleaners. Such women have multiple partners as sources of income (Djamba, 1997; Longfield et al, 2004). However, unwillingness to pay for condoms may perhaps be attributed to other non-economic factors such as restriction of condom use to non-marital sex or powerlessness (WHO, 2006). However, economic variables indicate risks of having multiple partners reduce as levels of education rise.

Economic factors have also been listed as major contributors to having cross-generational and multiple partners. For example, a study in Kenya found that cross-generational relations were common in urban centres and took a financial dimension. The study indicated that women's targets included police officers, *matatu* touts, truck drivers and on the whole, moneyed men who live away from their families (Longfield et al,

2004). Less gainfully employed adolescents have multiple partners to supplement income, as older men seek young women in colleges and secondary final years. The major reason for seeking supplementary incomes is that females usually work in low paying jobs such as maids, receptionists or telephone operators. Nevertheless, most adolescents have concurrent partners from age mates as well as older men.

The surest way of avoiding HIV infection is abstinence, which could be achieved in terms of delaying sexual debut. Having non-multiple partners have also been floated as HIV/AIDS infection risk reduction factor. However, correct and consistent condom use has emerged as a crucial ingredient in the fight against HIV/AIDS. Without condoms, many adolescent would be left in danger especially those who are coerced into sexual relations (WHO, 2004). The marginal changes resulting from inclusion of economic factors may thus be linked to poverty. Sexual encounters between adolescents have also been noted to be spontaneous, opportunistic and unplanned. Nevertheless, consistent condom use stands out as the most responsible (Longfield et al, 2004).

The results might indicate that ever use of alcohol is not the best measure of influence of alcohol on having sexual partners (Mugisha et al, 2003). The perception of a person's HIV status also emerges like a less considerable factor. However, combination of HIV status' perception and alcohol use could as well cancel out, since alcohol is known to distort judgement mainly in unplanned partners. Conversely, correct insight and inaccurate perception on HIV status apparently enhances precaution or increases risk of having multiple partners respectively. Severe alcohol causal effect hypothesis assumes that alcohol intoxication perhaps causes sexual partners that or else would not be formed: alcohol disinhibits behaviours and also impairs information processing, which may lead to unanticipated sexual partners (Gillmore et al, 1992).

The marginal surge in the risk of having multiple partners in model 6 is inconsistent with our earlier hypothesis. It emerges that access to multimedia HIV/AIDS information marginally increases the risk of having multiple partners for all categories but primary education where the risk again rises beyond that of the base category. Media has been credited with increasing HIV/AIDS awareness with potential to reduce HIV risk sexual behaviours as well as having multiple partners (Gupta et al, 2003). However, increased risk of having multiple partners perhaps indicates that media messages may

perhaps include pornographic resources, which imply patterns of sexual partners. The findings may moreover indicate that base category is not exposed as much as primary category hence inflated risk of having multiple sexual partners (Odhiambo, 2000).

The Kenya government had also been slow in providing basic HIV/AIDS information. In cases where state departments and agencies attempted reactions to the epidemic, its responses always assumed economic and demographic consequences. There is also an option that media misrepresented facts on HIV/AIDS. Sources of HIV/AIDS messages may be as well put to question. For example, Odhiambo (2000) found that sources of HIV/AIDS messages were individual journalists' initiatives hence leading perhaps to inadequate provision of safe skills. Since HIV/AIDS has spread far and wide, its social consequences dominate media coverage. Besides, a study on media access in Uganda reported that men tend to have more access to media than females, a situation that may perhaps explain the upsurge in the risk of having multiple sexual partners (Clark, 2003) as indicated in model 6.

Higher category has been consistently associated with the lowest risk of having multiple partners in all the six models. In fact, it is statistically significant in all the models save in model 1. There are various reasons that may attempt to explain the low risk of having multiple partners in the higher category. First of these reasons lies in the fact that most women with higher education could be married hence single partner or think in terms of stable unions. In fact, Blum & Mmari (2005) found that age and union status were important determinants of having multiple partners among young people. As indicated earlier, female adolescents in the 20 – 24 age group are most likely married or with stable partners. The above study found that adolescents who had been married or were currently married were significantly less likely to have multiple partners.

Another probable explanation of consistently low risk of having multiple partners among adolescents with higher education may lie in secrecy that surrounds having extramarital sexual partners. As noted above, is likely that adolescents with higher education are already married and therefore in case of multiple partners, reporting may be generally low. Since late adolescence is associated with serious relationships, its capacity for tender and sensual love is also enhanced. Concern for partner's feelings and well being of families are, in addition, crucial hence the need to maintain tight lids over any

extramarital affairs (WHO, 2004). The reported number of sexual partners in the 20 – 24 age group and higher category, if the two coincide as hypothesised, may be lower than the actual number of partners (Clark, 2003).

The models used to explain sexual behaviour among female adolescents in informal settlements in Nairobi reflect varying risks of having multiple partners. The high risk of secondary category in terms of gross effects of education reduces consistently with addition of control variables. The reductions in risk reflect partial accounts of individual characteristic, HIV/AIDS awareness and media sources of HIV/AIDS information in the risk of having multiple partners. The cross-sectional nature of the data, however, does not allow for causal relationships to be drawn. Some of the variations with addition of control variables may therefore fail to establish explanation within control variables themselves but reporting. For example, education, age and having sexual partners have been faulted on quality, misstatement and responses respectively.

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1 INTRODUCTION**

The present section summarises findings, provides conclusions and makes recommendations. The recommendations are relevant for policy formulation and further research in adolescence reproductive health. The major objective of the study was to investigate influence of education on having multiple partners. The study considered 1,148 adolescents who reported number of sexual partners at the time of the survey. The response variable has been multiple sexual partners and the main explanatory variable was education. The control variables included age, religion, ethnicity, perception of HIV status, employment, willingness to pay for condoms and media access to HIV/AIDS information. The study found significant associations between multiple partners and education using chi-square test. Bivariate results indicate that 34.8 percent of the respondents were having multiple sexual partners.

#### **5.1 SUMMERY OF FINDINGS**

The present study built on previous attempts to investigate determinants of HIV prevalence in adolescent populations in informal settlements (Mugisha et al, 2003; Zulu et al, 2002). Consistent views have been held that having multiple sexual partners carry considerable risk of HIV infection; and that education, in itself and through opportunities and norms, is an important determinant of safe sexual behaviour. Education has been linked to reduction of risks at individual and social levels and can integrate behaviours such as late coital debut, condom use and substance use, gender and employment. It is speculated that preventive mechanisms learnt in schools are crucial beyond institutional borders. However, education and sexual partners link generates mixed signals.

The study employed frequency distributions to establish background characteristics of study population. Cross tabulations were used to determine levels of association between sexual partnerships and education and control variables. Chi-square test was conducted to establish if the associations were statistically significant at 95 percent confidence interval. The study used multiple logistic regressions as the main tool for analysis to estimate relative risk of multiple sexual partnerships given categories of

education and control variables. Secondary education was significant considering cross effects of education, and higher category significant with all control variables.

Most respondents having multiple partners had primary and secondary education. Most respondents were aged 15 – 19 years old and approximately 95.2 percent were neither married nor living with partners. However, even some of those not in unions had had at least a partner and some were had multiple partners indicating considerable measure of partner change hence exposure to HIV/AIDS. The findings furthermore show that most respondents were unwilling to pay for condoms in the midst of high levels of unemployment. The Luo community reported having most multiple partners and were the predominant group considering ethnicity. However, in terms of religion, Protestants reported having most multiple partners.

The study also found that most of the respondents had never drunk alcohol with 22.3 percent of adolescents believing they could tell a person's HIV status through physical observation. The adolescents who reported highest number of multiple partners were unemployed at the time of the survey and most of these respondents received HIV/AIDS information from radio.

The multivariate results, however gave mixed signals. For instance, gross effects of education on risk of having multiple partners indicated highest risk of having multiple partners in the secondary category. Expectation would be that higher categories report lowest risk of having multiple partners. However, all the models indicate that higher category has lowest risk of having multiple partners. The risk of having multiple partners, marginally, but consistently reduces with additions of economic and cultural controls into the models. Alcohol use, HIV status perception and media access to HIV/AIDS information negligibly shifts the risk upwards with primary category indicating the highest risk of having multiple partners among female adolescents.

## **5.2 CONCLUSIONS**

The high HIV prevalence rates in urban centres and the high rate of new infections taking place among female adolescents warrants some action. However, multiple partners are present among female adolescents. More efforts need to be made to achieve consistent reductions in HIV/AIDS prevalence in order to reduce age specific and

overall mortality. The results indicate that education has achieved little in integrated approach to HIV/AIDS control initiatives especially in the informal settlements. It is only adolescents with higher education that have significant reduction in the risk of having multiple sexual partners. The other categories of education do not indicate considerable reductions in risks of having multiple partners that would be attributed to education.

The addition of demographic variables to the model shows statistically significant reduction of risk of having multiple partners in higher category and insignificant reductions for all the other education categories. Nevertheless, primary category registers the highest risk of having multiple partners in light of marriage status and ages of adolescents. Education offers more protection from risk of having multiple partners for all other categories than primary category. It is clear that the reduction is in terms of institutional marriage hence reduction of partners for female adolescents. Unfortunately, reduction in partners may be risky as husbands may retain sexual concurrency and avoid condom use, which increases risks of HIV infection.

The association of education and risk of having multiple partners for adolescents with primary education increases in light of psychosocial factors – perception of HIV status and alcohol use. However, interaction of HIV perception and ever use of alcohol remains unclear. The primary category indicates higher risk of having multiple partners than no education category contrary to expectations. The results for media access to HIV/AIDS information too defy our hypothesis, which had assigned media access to low risk of having multiple partners. The results call for further investigations into the risks of having multiple partners among adolescents to consistently reduce the risk of having multiple sexual partners and hence rates of new HIV infections in urban settings.

### **5.3 RECOMMENDATIONS FOR POLICY**

The findings indicate that in addition to education individual demographic characteristics, psychosocial, and access to media HIV/AIDS information make differences in the risk of having multiple partners of female adolescents in informal settlements. Research on demographic characteristics – marital status and age – could help identify effective interventions and highlight likely policy areas relevant to the adolescent population. Age and marital status are critical with respect to effects of

education on risk of having multiple partners. For instance, married females in late adolescence phase tend to report not having had multiple partners. The findings indicate that educational opportunities may manifest themselves differently for age groups and marital statuses in aspects of having multiple partners. The significance of higher education suggests that programmes targeting risk reduction that emphasise age and marital status may be particularly successful in addressing sexual behaviour.

Besides, the findings indicate that most adolescents with higher education report lowest risk of having multiple partners. Policy measures should therefore aim at increasing education beyond secondary levels to reduce risk of having multiple sexual partners. Further research is needed in the field of education and having multiple partners to establish other relevant variables that account for multiple partners among adolescents to help reduce HIV/AIDS prevalence in the country. In addition, neither do the findings imply that all non-multiple sexual partners are associated with lack of education nor the differences in sexual partners are as a result of varying levels of education alone.

The most obvious fact is that having multiple partners exposes adolescents to elevated risks of HIV infection and that HIV prevention programmes need to emphasise educational messages. Many such programmes focus primarily on commercial sex workers and either non-transactional sexual partners or treat rates of partner changes as irrelevant. Identifying policies and programmes appropriate in addressing multiple sexual partners is beyond the scope of this study yet such preventive efforts are crucial. The attempted identification of intermediate variables between education and risk of having multiple partners, the present study has opened the path for the rethinking common assumptions on the association between education and risk of having multiple partners.

HIV/AIDS information dissemination requires technical training in health and epidemiology journalism. Improvement of skills and reporting of HIV/AIDS related information might change the relatively high risk of having multiple partners witnessed after controlling for media access. Related to training of journalists is the establishment of HIV/AIDS resource centres to assist media in accessing data and accurate and relevant HIV/AIDS information. There is besides a requirement to carry out needs assessment of media houses, nature and pattern of HIV/AIDS coverage; and assess the training capacity of media in reproductive and sexual health (Odhiambo, 2000).

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APPENDIX 1: MODEL 1

<b>VARIABLES</b>	<b><math>\beta</math></b>	<b>S.E.</b>	<b>D.F.</b>	<b>SIG</b>	<b>EXP. (B)</b>
<b>Education level</b>					
No education (ref)	-	-	-	-	1.000
Primary	0.648	0.506	1	0.200	1.912
Secondary	-1.174	0.514	1	0.022	3.235
Higher	-1.386	0.893	1	0.280	0.250

APPENDIX II: MODEL 2

<b>VARIABLES</b>	<b><math>\beta</math></b>	<b>S.E.</b>	<b>D.F.</b>	<b>SIG</b>	<b>EXP. (B)</b>
<b>Education level</b>					
No education (ref)	-	-	3	-	1.000
Primary	0.288	0.588	1	0.624	1.333
Secondary	-0.080	0.600	1	0.894	0.923
Higher	-2.654	0.951	1	0.005	0.070
<b>Age</b>					
12 – 14 years	-	-	-	0.000	
15 – 19 years	2.506	0.292	1	0.000	12.259
20 – 24 years	3.627	0.313	1	0.000	37.611
<b>Marital status</b>					
Ever married	-	-	-	0.802	1.000
Living with partner	0.224	0.891	1	0.292	1.341
Neither	0.464	0.441	1	0.066	0.355
<b>Constant</b>	-2.259	0.736	9	0.002	0.14

APPENDIX III: MODEL 3

<b>VARIABLES</b>	<b><math>\beta</math></b>	<b>S.E.</b>	<b>D.F.</b>	<b>SIG</b>	<b>EXP. (B)</b>
<b>Education level</b>					
No education (ref)	-	-	3	0.001	1.000
Primary	0.186	1.176	1	0.874	0.988
Secondary	0.012	1.201	1	0.992	0.778
Higher	-3.199	1.459	1	0.028	0.033
<b>Age</b>					
12 – 14 years	-	-	-	0.692	1.000
15 – 19 years	-0.905	1.064	1	0.395	0.386
20 – 24 years	-0.852	1.083	1	0.432	0.428
<b>Marital status</b>					
Ever married	-	-	-	0.802	1.000
Living with partner	0.224	0.891	1	0.292	1.267
Neither	0.464	0.441	1	0.066	1.449
<b>Employment status</b>					
Currently working	-	-	-	-	-
Not working	-0.167	0.276	1	0.545	0.931
<b>Condom payment</b>					
Willing to pay	-	-	-	-	-
Unwilling to pay	-0.540	0.294	1	0.066	0.580

APPENDIX IV: MODEL 4

VARIABLES	$\beta$	S.E.	D.F.	SIG	EXP. (B)
<b>Education level</b>					
No education (ref)	-	-	3	0.001	1.000
Primary	0.186	1.176	1	0.874	0.908
Secondary	0.012	1.201	1	0.992	0.767
Higher	-3.199	1.459	1	0.028	0.033
<b>Age</b>					
12 – 14 years	-	-	-	0.692	1.000
15 – 19 years	-0.905	1.064	1	0.395	0.404
20 – 24 years	-0.852	1.083	1	0.432	0.460
<b>Marital status</b>					
Ever married	-	-	-	0.802	1.000
Living with partner	0.224	0.891	1	0.292	1.418
Neither	0.464	0.441	1	0.066	1.501
<b>Employment status</b>					
Currently working	-	-	-	-	-
Not working	-0.167	0.276	1	0.545	0.884
<b>Condom payment</b>					
Willing to pay	-	-	-	-	-
Unwilling to pay	-0.540	0.294	1	0.066	0.575
<b>Religion</b>					
Catholic	-	-	-	-	-
Protestant	-0.354	0.292	1	0.226	0.724
Muslim	0.439	0.891	1	0.23	1.888
No religion	-0.642	1.210	1	0.595	0.590
Other					
<b>Ethnicity</b>					
Kamba	-	-	-	-	-
Kikuyu	-0.759	0.440	1	0.085	0.474
Luo	-0.501	0.472	1	0.289	0.603
Luhya	-0.192	0.473	1	0.684	0.789
Other	-0.820	0.579	1	0.157	0.370

APPENDIX V: MODEL 5

VARIABLES	$\beta$	S.E.	D.F.	SIG	EXP. (B)
<b>Education level</b>					
No education (ref)	-	-	3	0.001	1.000
Primary	0.186	1.176	1	0.874	1.126
Secondary	0.012	1.201	1	0.992	0.922
Higher	-3.199	1.459	1	0.028	0.037
<b>Age</b>					
12 – 14 years	-	-	-	0.692	1.000
15 – 19 years	-0.905	1.064	1	0.395	0.393
20 – 24 years	-0.852	1.083	1	0.432	0.441
<b>Marital status</b>					
Ever married	-	-	-	0.802	1.000
Living with partner	0.224	0.891	1	0.292	1.413
Neither	0.464	0.441	1	0.066	1.547
<b>Employment status</b>					
Currently working	-	-	-	-	-
Not working	-0.167	0.276	1	0.545	0.887
<b>Condom payment</b>					
Willing to pay	-	-	-	-	-
Unwilling to pay	-0.540	0.294	1	0.066	0.583
<b>Religion</b>					
Catholic	-	-	-	-	-
Protestant	-0.354	0.292	1	0.226	0.726
Muslim	0.439	0.891	1	0.23	1.920
No religion	-0.642	1.210	1	0.595	0.590
Other					
<b>Ethnicity</b>					
Kamba	-	-	-	-	-
Kikuyu	-0.759	0.440	1	0.085	0.461
Luo	-0.501	0.472	1	0.289	0.602
Luhya	-0.192	0.473	1	0.684	0.791
Other	-0.820	0.579	1	0.157	0.377
<b>Alcohol</b>					
Ever use	-	-	-	-	-
Never use	-0.198	0.288	1	0.492	0.866
<b>HIV status perception</b>					
Can tell	-	-	-	-	-
Cannot tell status	0.185	0.318	1	0.562	1.203
Don't know	19.417	27914.6	1	0.999	2.9E+08

APPENDIX VI: FULL MODEL

VARIABLES	$\beta$	S.E.	D.F.	SIG	EXP. (B)
<b>Education level</b>					
No education (ref)	-	-	3	0.001	1.000
Primary	0.186	1.176	1	0.874	1.204
Secondary	0.012	1.201	1	0.992	1.012
Higher	-3.199	1.459	1	0.028	0.041
<b>Age</b>					
12 – 14 years	-	-	-	0.692	1.000
15 – 19 years	-0.905	1.064	1	0.395	0.404
20 – 24 years	-0.852	1.083	1	0.432	0.422
<b>Marital status</b>					
Ever married	-	-	-	0.802	1.000
Living with partner	0.224	0.891	1	0.292	1.251
Neither	0.464	0.441	1	0.066	1.590
<b>Employment status</b>					
Currently working	-	-	-		
Not working	-0.167	0.276	1	0.545	0.846
<b>Condom payment</b>					
Willing to pay	-	-	-		
Unwilling to pay	-0.540	0.294	1	0.066	0.583
<b>Religion</b>					
Catholic	-	-	-	-	-
Protestant	-0.354	0.292	1	0.226	0.702
Muslim	0.439	0.891	1	0.23	1.550
No religion	-0.642	1.210	1	0.595	0.526
Other					
<b>Ethnicity</b>					
Kamba	-	-	-	-	-
Kikuyu	-0.759	0.440	1	0.085	0.468
Luo	-0.501	0.472	1	0.289	0.606
Luhya	-0.192	0.473	1	0.684	0.825
Other	-0.820	0.579	1	0.157	0.440
<b>Alcohol use</b>					
Ever use	-	-	-	-	-
Never use	-0.198	0.288	1	0.492	0.820
<b>HIV status perception</b>					
Tell HIV status	-	-	-	-	-
Cannot Tell	0.185	0.318	1	0.562	0.1203
Don't know	19.471	27914	1	0.999	2.9E+08
<b>Media access</b>					
Radio	-0.153	0.304	1	0.614	0.858
Television	0.020	0.292	1	0.946	1.020
Newspapers	0.140	0.307	1	0.650	1.150
Mosque & Churches	0.368	0.322	1	0.253	1.444
Schools and teachers	-0.045	0.299	1	0.881	0.956