EXAMINING THE EFFECTS OF HIV KNOWLEDGE AND PERCEIVED RISK OF HIV INFECTION ON CONDOM USE AMONG YOUTH:

THE CASE OF SOUTH AFRICA

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DECLARATION

I Emelda Thabang Kaneli, declare that this research report is my own work. It is being submitted for the degree of Master of Arts in Demography and Population Studies at the University of the Witwatersrand, Johannesburg. To the best of my knowledge, it has not been submitted before in part or in full for any degree or examination at this or any other University.

……. [Signature of candidate]

…… day of ……, 20….

Dedication

This research report is dedicated to Edwin Lehlohonolo Kaneli and junior Kaneli.

Acknowledgements

I would like to thank my mother Mapali Kaneli and sister Tumi Kaneli for their support and patience throughout my research process. My sincere gratitude goes to my supervisor Doctor Nicole De Wet for her guidance. I would lastly like to thank all my friends and colleagues who got me through all the hurdles and sleepless nights. Lastly I would like to thank the National HIV Communication Survey (NCS) Steering Committee for allowing me to analyse the NCS 2012 data for my study

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Abstract

Background

HIV/AIDS continues to be a major health concern in Sub-Saharan Africa. South Africa, with an HIV prevalence of 10%, is one of the worst affected countries. The majority of new infections occur among young people aged 15-24 years and this is largely a result of not using condoms. The government and many NGOs have responded to this problem by introducing HIV education into the school curriculum and launching awareness campaigns and programmes. This was done with the expectation that an increase in HIV knowledge would lead to an increase in condom use among youth. Research based on the Health Belief Model has also found that people are more likely to adopt healthy behaviours if they think they are at risk of illness. In this regard perception of HIV infection among youth and the effect it has on condom use needs to be assessed.

Objective

The aim of the study was to investigate the relationships between HIV knowledge, perceived risk of HIV infection and condom use among youth aged 16-24 in South Africa.

Methods

The study was conducted using the National HIV Communication Survey of 2012 using a sample of 1795 sexually active males and females aged 16-24 years. For the descriptive statistics cross tabulations were conducted to assess the levels and distribution of condom use. Additionally, non-condom use rates were computed to assess the level of lack of condom use among youth. To investigate the association between HIV knowledge, perceived risk of HIV infection and condom use among youth a binary logistic regression was run at a bivariate and multivariate level.

Results

The study found that 38% of youth do not use condoms. The study also found that the association between lack of condom use and HIV knowledge was insignificant [p-value > 0.005], however the odds ratios show that as HIV knowledge increases there is a slight increase in condom use. The study found a significant association between perceived risk and lack of condom use [p-value < 0.005] however, the results show that youth who perceive themselves as being at risk of infection are less likely to use condoms. In addition the study found associations between lack of condom use and the other socio-demographic and relationship factors, namely, age, place of residence, province, education level, employment status, age at first sex, relationship status and knowledge of partners' other sexual partners.

Conclusion

The study found that the association between HIV knowledge and condom use was insignificant, however there was a significant association between perceived risk of HIV infection and condom use at last sex. The results of the study has shown that it is important to increase HIV knowledge among youth but this is not enough to prevent HIV infection. More needs to be done particularly in regard to perception of risk of HIV infection.

Chapter 1: Introduction

1.1 Background

HIV/AIDS continues to be a major health concern in Sub-Saharan Africa. It has a particularly high prevalence in the Southern African region. Swaziland, Botswana, Lesotho and Zimbabwe have the highest HIV/AIDS prevalence in the world ranging from 15%- 27.4% among adults aged 15-49 (UNAIDS, 2013). South Africa, much like the other Southern African countries has one of the highest prevalence of HIV /AIDS among adults aged 15-49 in the world at 16.8% (Statistics South Africa, 2014). This is a significantly high HIV/AIDS prevalence when compared to other African countries such as Kenya and Malawi which have a HIV prevalence of 5.9% and 9.1% among adults aged 15-49 respectively (UNAIDS, 2015).

The majority of new HIV infections occur between the ages of 15-24 (Department of Health, 2012). The HIV incidence for this age group is 1.5% with 139,000 new infections occurring each year and a prevalence of 8.7% in 2014 (Shisana et al., 2012; Statistics South Africa, 2014). In South Africa, the predominant mode of HIV transmission is through heterosexual sex. This is evidence that young people are engaging in risky sexual behaviours, particularly the inconsistent use of condoms.

Directing prevention strategies at young people is the key to defeating the epidemic as more than half of new infections occur in the 15-24 age group. In response to the high HIV incidence and prevalence among youth, the South African government implemented education and awareness campaigns to promote public awareness, HIV/AIDS education, and promote safer sexual behaviour (Peltzer & Promtussananon, 2003). In the year 2000, Life Orientation (LO), was introduced into the school curriculum by the department of education for all grades across the country. LO **'**is the study of the self in relation to others and to society. It applies a holistic approach. It is concerned with the personal, social, intellectual, emotional, spiritual, motor and physical growth and development of learners, and the way in which these dimensions are interrelated and expressed in life' (Department of Education, 2003). With regards to HIV and reproductive health, LO was intended to increase knowledge and equip

the learners with skills to make well informed decisions about their reproductive health. In addition to using the school curriculum to address HIV, various HIV communication programmes have been implemented using television, print media, social media and radio. An example would be the soul city institute for social justice which was launched in 1994 and aimed to promote health and social change through multimedia, and the Scrutinize HIV campaign, which was established in 2008 by the Johns Hopkins University programme, and aimed to encourage youth to understand their risk of HIV infection in relation to multiple concurrent partners, correct and consistent condoms use and transactional sex (Scrutinize, 2016). More recently, the Integrated School Health Policy (ISHP), the National Youth Policy (NYP) 2015–2020, and the National Adolescent Sexual and Reproductive Health and Rights Framework (NASRHRF) strategy 2014–2019, have been developed. The integrated school health policy targets school learners with the provision of health education and promotion, learner assessment and screening and on-site health facilities.

The government went to great lengths to implement methods which would increase knowledge and awareness of HIV and risky sexual behaviours. In 2010, 65% of adolescents reported receiving HIV knowledge at schools (Reddy et al., 2010). It had been expected that the youth would become more aware of the sexual risk behaviours that put them at risk of infection and would change their behaviour accordingly (Peltzer & Promtussananon, 2003; Gallent & Tyndale, 2004). However, risky sexual behaviours have remained high. It is reported that 35% of adolescents use condoms “sometimes” and 32% “never” use condoms (Department of Health, 2012). This suggests that HIV knowledge is either poor and unable to affect behaviour, or having HIV knowledge does not result in behaviour change (Peltzer & Promtussananon, 2005).

Risky sexual behaviours remain high, yet only 11.7% of the adolescents think they could become infected with HIV in their lifetime (Reddy et al., 2010). When adolescents think they are at risk of HIV infection they are more likely to employ protective mechanisms (Makiwane, 2009). Adolescents are characterised by an immature cognitive function and this may inhibit their ability to apply their HIV knowledge to their own sexual behaviour thus rendering them unable to correctly evaluate their risk

of infection (Pedlow & Carey, 2004). Adolescents also have what is referred to as optimistic bias meaning that they underestimate their personal risk of infection in relation to that of their peers (Makiwane, 2009; Chapin, 2001).

1.2 Problem Statement

Lack of condom use increases the likelihood of contracting HIV which is particularly problematic as South Africa has one of the highest HIV/AIDS prevalence's in the world. The impact of the disease has been widespread in the country with 30.5% of deaths in 2015 related to AIDS; while this is a high percentage it has decreased significantly from 50.7% of deaths being related to AIDS which is the highest recorded HIV related deaths in South Africa as a result of the increase in the roll-out of Antiretroviral therapy (ART) (Statistics South Africa, 2015). Life expectancy at birth shows that HIV takes 6.5 years of life from an individual infected with HIV as life expectancy at birth without HIV is 69.0 years, however, with HIV it is 62.5 years (Statistics South Africa, 2015). As a result of the ART rollout, life expectancy at birth with HIV has increased from 53.4 years in 2004 (Statistics South Africa, 2015). Individuals infected with HIV are also prone to opportunistic diseases such as tuberculosis (TB) (SANAC, 2014). According to Stats SA, TB is the leading cause of natural deaths in South Africa (MCOD, 2014).

The prevalence of other sexually transmitted infections (STIs) among adolescents in South Africa is 4.4% (Reddy et al., 2010). The national antenatal survey of 2012 conducted in four South African provinces (KwaZulu-Natal, Gauteng, Western Cape and Northern Cape) found an HSV-2 (Human Herpes virus 2) prevalence of 55.8% among pregnant women (SANAC, 2014). A study conducted among adult women in rural South Africa found a chlamydia prevalence of 16% and a gonorrhoea prevalence of 10% among them (Peters et al., 2014). An estimated 21% of women in South Africa have the Human papilloma virus (HPV) (Moodley et al., 2013). An additional issue is that most of the STIs are asymptomatic and go undetected and untreated (Reddy et al., 2010; Peters et al., 2014). Untreated STIs have long term adverse health implications such as infertility and cervical cancer

(Department of Health, 2012). If left untreated, syphilis, gonorrhoea and chlamydia cause pelvic inflammatory disease (PID) which contributes to infertility. Cervical cancer is the cancer with the second highest frequency among women in South Africa; statistics show that 5 743 women are diagnosed with cervical cancer and 3 027 women die from the disease annually, and HPV is responsible for 62.8% of cervical cancers (Moodley et al., 2013).

In addition to the negative health outcomes, lack of condom use puts youth at risk of having unwanted pregnancies (Bryan, 2006). Childbearing at a young age can have negative health, educational and socioeconomic consequences. Girls who fall pregnant while at school are legally allowed to be at school until they deliver and are allowed to return to school after the delivery, and this was done so that the pregnancy can have minimal impact on schooling (Mturi, 2013). Research has however found that despite this, pregnancy among school going adolescents, results in high levels of absenteeism, low academic performance, school drop-outs and lower educational attainment (Makiwane, 2009). The disrupted education has immediate negative economic consequences on the household as the dependency ratio increases, and holds negative future economic consequences for the adolescent as low levels of education result in difficulty finding employment or finding low paying jobs (Makiwane, 2009). Unwanted pregnancies can also result in dangerous abortions which are a health risk. According to the Choice of Termination of Pregnancy Act No.92 of 1996, pregnant women are allowed to make a choice on terminating a pregnancy up to 12 weeks of gestation. Despite this Act, adolescents opt for dangerous backstreet or self-induced abortions out of fear of being stigmatized by the community and health care workers (Mturi, 2013).

The country has also experienced negative socioeconomic outcomes. HIV related morbidity and mortality threatens the development of South Africa because it mainly affects those of working age (Gould, 2009). When people fall ill due to HIV infection, work is disrupted which has an impact on the finances of the household and the economy of the country in general (Gould, 2009). This also means that more people become dependent on the public health system which is already under pressure.

1.3 Research Question

What is the relationship between HIV knowledge, perceived risk of HIV infection and lack of condom use among youth aged 16-24 in South Africa?

1.4 Research Objectives

1.4.1 General Objective

To investigate the relationship between HIV knowledge, perceived risk of infection and lack of condom use among youth aged 16-24 in South Africa.

1.4.2 Specific Objectives:

1.4.2.1 To describe the levels of HIV knowledge, perceived risk of HIV infection and lack of condom use among youth aged 16-24 in South Africa.

1.4.2.2 To identify the demographic and socioeconomic determinants of lack of condom use among youth aged 16-24 in South Africa.

1.4.2.3 To test the association between HIV knowledge, perceived risk of HIV infection and lack of condom use among youth aged 16-24 in South Africa.

1.5 Justification

Condom use plays a vital role in preventing new sexually transmitted HIV infections and unwanted pregnancies. As such it is important to investigate the role of HIV knowledge and perceived risk of HIV infection on the uptake of condoms. This will provide policymakers with information to better understand condom use among youth. Additionally, it will enable more effective intervention programmes and policies to be established, implemented and monitored.

The South African National Youth Policy (SANYP) seeks to address the issues which challenge youth and one of the issues which have been identified as a priority is HIV/AIDS (SANYP, 2015). According to the SANYP, addressing HIV is important for the development of youth. Youth development institutions, such as institutions of learning, have failed the youth as new HIV infections continue to

occur among youth (SANYP, 2015). These are important issues which need to be addressed. This research will assist the SANYP and the institutions aimed at youth development to address the issue of HIV by helping them understand condom use among youth, and how it is influenced by the way youth perceive their risk of HIV infection and the knowledge youth have about prevention of HIV. For example, schools through LO have tried to teach pupils more about HIV prevention, however taking into consideration whether the knowledge imparted to the students and the perception the students have of their risk of HIV infection results in behaviour change, can help the schools address the issue of condom use from a more informed position and find more innovative and efficient ways of encouraging young people to protect themselves against HIV.

One of the expected outcomes of the National Adolescent Sexual and Reproductive Health and Rights Framework (NASRHRF) strategy 2014–2019, is to protect adolescents from HIV, other sexually transmitted infections, and unwanted and unintended pregnancies (NASRHRF, 2015). Understanding condom use among youth will enable the NASRHRF to achieve its goal because the consistent and correct use of condoms is the only method which can protect against HIV and other STIs.

This research will contribute towards monitoring and evaluating policies such as the strategic plan on HIV, STIs and TB for 2007–2011, to ensure that they achieve their goals. In April 2007, former deputy president Phumzile Mlambo-Ngcuka, introduced a strategic plan on HIV, STIs and TB for 2007–2011 which was aimed at reducing all new HIV infections by 50% by the year 2011 (NSP, 2006). The incidence of HIV decreased from 1.59% in 2007 to 1.25% in 2011 (Statistics South Africa, 2014). The strategic plan failed to meet its objective of decreasing HIV infection by 50%. After failing to meet these goals in the defined period, the strategic plan on HIV, STIs and TB for 2012–2016 was introduced with new goals set to be achieved between 2012-2016. The new goals set out to firstly address the social and structural drivers of HIV (SANAC, 2011). The second goal was to achieve zero new infections of HIV, STIs and TB (SANAC, 2011). Addressing the issue of lack of condom use plays a role in both of these goals. This research will therefore inform policies and strategies such as these to enable them to achieve their goals and not have to constantly revise them.

The Sustainable Development Goals (SDGs) aim to end the AIDS epidemic by 2030 (United Nations, 2016). This research will inform policies which will enable South Africa to achieve the sustainable development goals by 2030 because youth are currently the drivers of the epidemic as the majority of new infections occur among them. Addressing condom use, which is the only method of preventing the sexual transmission of HIV, is the only way to prevent new infections and end the epidemic. While unprotected sex is not the only mode of HIV transmission, it is the most prominent mode of transmission in South Africa, and as such it is vital to address it.

1.6 Definition of terms:

- HIV knowledge – Ability to identify the three major ways of preventing the sexual transmission of HIV correctly. These being abstinence, condom use and limiting sex to one faithful and uninfected partner (UNICEF, 2002).
- Perceived risk – An individual's perceived susceptibility to a disease (Hochbaum, 1958).
- Condom use – The use of condoms as a protective mechanism against infections (Younge et al., 2008). For the purpose of this study it will be measured using the variable 'condom use at last sex' and this will be used as a proxy to measure the general use of condoms among youth because condom use at last is a valid proxy for measuring condom use over a period of time however it does not measure whether the condom use was consistent or not (Younge et al., 2008).

Chapter 2: Literature Review

2.1 Literature Review

2.1.1 Determinants of condom use

Condom use and age

Simbayi et al. (2014) conducted a study on the covariates of condom use in South Africa using the national population based survey of 2008. They found that youth and adults of both sexes had higher levels of condom use when compared to the elderly and they attributed this to the condom use and distribution campaigns which encourage condom use among youth (Simbayi et al., 2014). A study conducted by Matson et al. (2010) found that as women grow older their condom use decreases. This is because the types of relationships they are involved in change from having multiple sexual partners to monogamous relationships (Matson et al, 2010).

Condom use and socioeconomic status

Low socioeconomic status, which was measured using level of education, place of residence and unemployment, has been associated with high levels of condom use, and it is explained that this was because the prevalence of HIV is high among the poor and as a result they feel a need to use condoms to protect themselves as they are aware of the high levels of HIV among them (Simbayi et al., 2014). Contrary to the findings of Simbayi et al (2014) other studies have found that a higher socioeconomic status fosters condom use (Petiffor et al., 2008). It has been found that women who are more educated and have a higher income are more likely to use condoms as they have more decision making powers in relationships and are thus better able to negotiate condom use. These women are also found to be less likely to engage in risky relationships such as those involving transactional sex because of their socioeconomic status (Shai et al., 2012; Lammers et al., 2013).

Condom use and relationship status

The status of relationships has an impact on condom use. Women in relationships spanning a period of less than a year had a higher likelihood of using condoms (Simbayi et al., 2014). In addition, another study found that young adults who were married or were in a relationship spanning more than six months were significantly less likely to have used a condom at last sex (Hendriksen et al., 2007). Youths also report that wanting to use condoms in relationships which are considered as serious suggests unfaithfulness and lack of trust (Matson et al., 2011). "Teens who reported higher levels of self-disclosure and stronger feelings of enmeshment, love, and relationship salience experienced less consistent condom use. Thus, adolescents who may be in higher quality relationships are in fact facing greater sexual risk by not using condoms consistently" (Manning et al., 2011:10). These studies generally show that relationships which are stable and positive lead to a lower likelihood of using condoms, however, Manning et al. (2011) also found that adolescents who reported more conflict and control in their relationships, feelings of mistrust and jealousy, and who experienced a feeling of superiority relative to their partner, had lower odds of consistently using condoms. Relationships in which intimate partner violence occurs have also been found to be associated with low condom use (Jewkes et al., 2010). There is thus no clear consensus on the type of relationship which encourages condom use.

Condom use and communicating about sex

A study conducted by Hendriksen et al. (2007) on the predictors of condom use among young adults in South Africa using the Reproductive Health and HIV Research Unit National Youth Survey found that condom use at sexual debut and communicating with your sexual partner were the most important predictors of condom use at last sex. Parent-offspring communication about sexual issues and condom use has also been found to have a positive association with condom use among youth in Sub-Saharan Africa (Manisi et al., 2013). In a study conducted by Mturi (2015) among young unmarried women in South Africa, the author reported that the teenage pregnancies among the participants were due to

lack of information on sexual and reproductive health. A study conducted among out of school youth aged 15-24 in Nigeria, found that condom use is more likely to occur in relationships where there is opportunity to discuss sex (Adebiyi & Asuzu, 2009). These studies show that communication, whether between sexual partners or parent to offspring, is important for encouraging the use of condoms during sexual intercourse.

Condom use, future optimism and self-efficiency

Being optimistic about the future has been found to be a strong predictor of condom use among youth (Hendriksen et al., 2007). Having a high efficiency of condom use has also been found to be a strong predictor of condom use. A study was conducted in Cape Town South Africa to investigate condom use among adolescents. Similar to Hendriksen et al (2007) , the study found that being optimistic about the future and self-efficiency were associated with the intention to use condoms (Bryan et al., 2006). For women, attitudes towards condoms was correlated with HIV knowledge, but not for males. It is explained that this could be due to the fact that females are more concerned about unwanted pregnancies and infections than their male counterparts (Bryan et al., 2006). Condom use among young women is largely motivated by unwanted pregnancy (Roye & Seals, 2001). Youth who use hormonal contraceptives were found to be less likely to use condoms as protection against pregnancy is one of the main motives for condom use and the use of contraceptives takes away this motive (Roye & Seals, 2001). However while girls may have a more positive attitude towards condoms than boys, boys have an increased likelihood of using condoms when compared to girls (Bryan et al., 2006).

Condom use and relationship inequity

- ***Transactional sex***

Condom use has generally increased, however there is still a problem with inconsistent condom use. Zembe et al (2012) conducted a study which investigated the covariates of inconsistent condom use among young women with multiple sexual partners in peri-urban South Africa. The study found that

transactional sex with older partners was a covariate of inconsistent condom use. It is explained that this is due to the lack of empowerment which results from abject poverty (Zembe et al., 2012).

The issue of lack of condom use and transactional relationships was also investigated by Onoya et al. (2012) among young black women in peri-urban areas in Western Cape South Africa. Inconsistent with the findings of Zembe et al. (2012), Onoya et al. (2012) found that women who reported having a history of transactional relationships were more likely to use condoms than those who reported no history of transactional sex. Women with a history of transactional sex were also more likely to use condoms than those who reported a history of casual sex (Onoya et al., 2012). The study explains that women with a history of transactional sex are more assertive about the use of condoms because they perceive themselves as being at a greater risk of infection (Onoya et al., 2012).

- ***Gender***

Protogerou et al. (2013) investigated the predictors of condom use among South African university students. The study found that women, particularly those aged 20-24 years, are less likely to have used a condom at last sex when compared to their male counterparts and this has been attributed to power dynamics involved in the negotiation of condom use (Protogerou et al., 2013). The lower use of condoms among women as compared to men has been attributed to gender issues; women have been found to lack decision making powers in regard to the use of condoms because of their subservient status in relationships (Jewkes et al., 2010; Shai et al., 2012; Lammers et al., 2013).

- ***Intimate partner violence***

The case of relationship power inequity was further investigated by Jewkes et al. (2010) and found that women who are victims of intimate partner violence are less likely to use condoms and are at a higher risk of HIV infection (Jewkes et al., 2010). A study conducted in South Africa found that high levels of intimate partner violence and coerced sex are associated with non-adherence to condoms and new HIV infection, this is because condom use is predominantly decided upon by the male partners and tends to be inconsistent (Kacanek et al., 2013; Kouyoumdjian, 2013). Women are unable

to assert condom use because of the inequity in the relationship (Jewkes et al., 2010). Studies have found that women who experienced intimate partner violence lack condom use self-efficiency meaning they were unable to negotiate condom use (Swan & O'Connell, 2012; Minton et al., 2016). These studies have shown that experiencing intimate partner violence reduces the likelihood of negotiating condom use.

Condom use and concurrency

Delva et al. (2013) conducted a study investigating the effect of concurrency on lack of condom use in Cape Town South Africa. Concurrency refers to when a person is involved in more than one sexual partnership in a given period. The study was conducted on the basis that if concurrency resulted in coital dilution or condom use increase, then the transmission-facilitating effect of concurrency would be reduced (Delva et al., 2013). The study however found no evidence of concurrency leading to increased condom use. This means that concurrency is not a determinant of condom use and this differs to the findings of Simbayi et al. (2014). Their study found that males with more than one sexual partner had an increased likelihood of using condoms (Simbayi et al., 2014).

2.1.2 HIV knowledge

Mass media HIV knowledge

Mass media has been used to deliver HIV/AIDS messages to the public to increase their knowledge. 'Lovelife', a South African health organisation, deliberately uses puzzling messages in their media campaigns to encourage people to further discuss the message with their peers (Lubinga et al., 2010). Research has shown that it is not the puzzling content, but its attractiveness and personal relevance, which makes people inclined to further discuss the message (Lubinga et al., 2010). Other studies have found that messages that are more explicit and easy to understand have better chances of inciting discussions about HIV messages (Jansen & Janssen, 2010; Hoeken et al., 2009). A study investigating the effects of youth HIV prevention programmes found that 'Lovelife' multimedia exposure could change behaviour and protect against HIV infection (Peltzer et al., 2012).

Condom social marketing

Condom social marketing is centred around the idea of using commercial advertising and private sector distribution of condoms to promote condom use (Pfeiffer, 2004). Condom social marketing has become the core of HIV education and intervention programmes. Another component of condom social marketing is designing condom brands in such a way that they are appealing and reflect local cultural values. The pricing of the condoms is also tailored to the local economy (Sweat et al., 2012). Sweat et al. (2012) conducted a study to investigate the relationship between condom social marketing and condom use. The study found that condom social marketing had a moderate effect on condom use, however over time, condom social marketing can lead to substantial increase in condom use (Sweat et al., 2012).

The effectiveness of social marketing in promoting reproductive health among adolescents has also been investigated by Meekers (2000). It investigated whether mass media campaigns, aimed at giving reproductive health information and promoting condom use, would be able to influence beliefs related to pregnancy and HIV infection prevention. Meekers (2000) found that social marketing was

able to effectively influence pregnancy prevention behaviour but was not as effective in influencing HIV infection prevention behaviour (Meekers, 2000). This is because the campaigns were unable to increase awareness of personal perceived risk of HIV infection but were able to increase perceived personal risk of pregnancy (Meekers, 2000).

School based HIV knowledge

Kinciad et al. (2014) conducted a study on the HIV communication programmes and condom use at sexual debut in South Africa. The study found that there is no association between HIV communication programmes and condom use at sexual debut

Throughout the world people view sex and HIV education programmes as a partial solution to the problem of adolescents' risky sexual behaviours. South Africa was one of the countries which saw school based HIV education as a key component to fighting HIV. The country responded to the problem of risky sexual behaviours of adolescents with the implementation of school based HIV education programmes (Peltzer & Promtussananon, 2003).

The implementation of the programme was impeded by the teacher's lack of knowledge and discomfort in discussing sexually related topics with students (Mathews et al., 2007). While school based HIV education was seen as a being able to reach many youths it has been critiqued for not being able to reach students who drop out of school and are considered to be at a higher risk of infection (Kirby et al., 2006). Research has also found that school based HIV knowledge has had marginal success in changing the sexual behaviours of adolescents and is considered to be failing adolescents in Africa (Magnani et al., 2005).

There have been areas of success in school based HIV education. Peer-led education strategies have been identified as an effective method for providing health education which enables learners to participate and feel empowered (Frantz, 2015). Peer education has been successful because education is received from someone who the youth identify with and share similar concerns, additionally young people generally see each other as more viable sources of sex related information (Frantz, 2015;

Dalrymple & Durden, 2006). Peer education has been found to be a cost effective method which can be used in rural areas.

2.1.3 Perceived risk

Perceived risk and stigma

HIV is highly stigmatised and because of this youth may avoid perceiving themselves as being at risk of the disease because in doing that they would be associating themselves with stigmatised groups (Anderson et al., 2007). This in turn leads young people to underplay their personal risk, thus making the perceived risk low. The stereotypical association of HIV with certain groups of people also leads to the rest of the population underestimating their risk of contracting the disease. For example, when HIV was associated with gay men and illegal drug users, it made heterosexuals and non-drug users perceive themselves to not be at risk of contracting HIV (Prohaska et al., 1990). HIV tends to be associated with promiscuity, and as a result, those who see themselves as not being promiscuous, see themselves as having a low risk of infection.

Perceived risk and optimistic bias

Literature explains that young people display an optimistic bias which is a tendency to systematically underestimate one's personal risk (Ellen et al., 1996). This is because the period of adolescence is characterized by a heightened sense of invulnerability and impulsiveness, and exaggerated denial. Adolescents are also characterized as being concerned with immediate risk rather than long term risk (Ellen et al., 1996).

Perceived risk assessment and trust

Married couples, as well as couples who perceive themselves as being in serious relationships, have been found to be less likely to use condoms. Longfield et al. (2002) investigated the barrier to condom use among these couples. The study found that people in serious relationships trust their sexual partners, and as a result of this trust, they are unable to appropriately assess their risk of HIV infection, and in addition, they are unable to personalize their risk of infection (Longfield et al., 2002). The study found that the assessment of risk of infection is made without considering the partners' historical sexual behaviours (Longfield et al., 2002). These findings are similar to those of Maharaja and Cleland

(2005) who found that married and cohabiting women's perceived risk of infection can override the male partner's objection to condom use. In this study women knew their partner was unfaithful and the lack of trust leads to them insisting on condom use (Maharaja & Cleland, 2005). This shows that the ability to correctly assess one's risk of infection has an effect on condom use despite the type of relationship they are in.

Perceived risk and risk rationalization

Theories of behaviour change are centred around the idea that risk perception has the ability to make people adopt health behaviours so as to decrease their risk of acquiring a certain illness (Corneli et al., 2014). There are however barriers to behaviour change despite perceiving the risk of acquiring a certain illness. Risk rationalization refers to actively coming up with beliefs to justify risky behaviour, so instead of changing the risky behaviour due to perception of risk, the individual resorts to justifying their behaviour to themselves and continuing with the risky behaviour (Buunk & Dijskra, 2000). So while perception of risk has the ability to influence behaviour change, rationalizing this perceived risk may lead to a continuation of the risky behaviour.

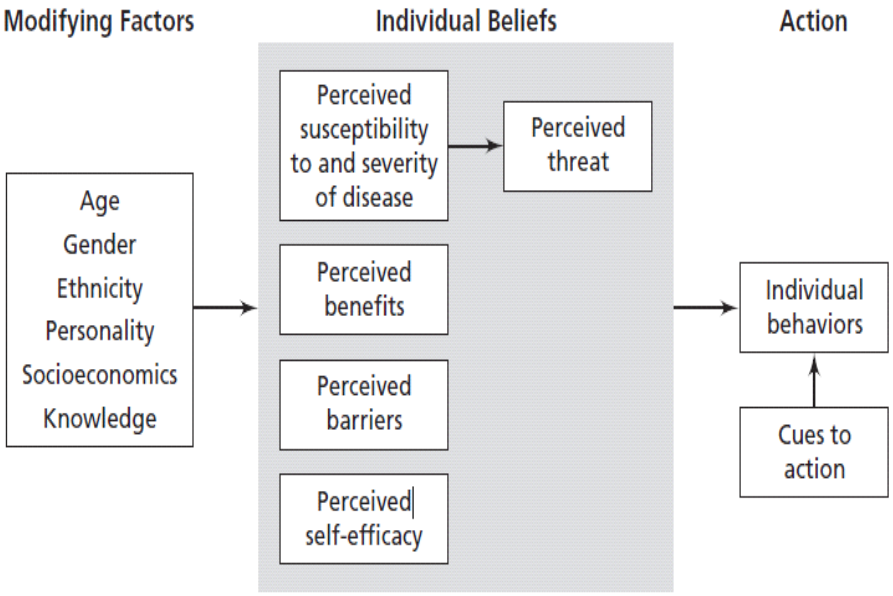
2.2 Theoretical Framework

The study is based on the Health Belief Model which was conceptualized by Hochbaum in the 1950s (Champion & Skinner, 2008). The main idea of the Health Belief Model is that health behaviour is determined by an individual's perception of a disease and the available strategies to decrease its occurrence (Hochbaum, 1958). According to the model, perception of a disease is based on how an individual perceives the seriousness of the disease and their susceptibility to it, the benefits of taking measures against it and the barriers preventing them from doing so.

There are also 'modifying factors', being an individual's characteristics which influence perception of a disease. Factors such as culture, education level, knowledge and past experiences all influence the way an individual perceives a disease (Champion & Skinner, 2008).

This model is used as it shows the pathways used by perception of risk and knowledge of a disease to influence an individual's health behaviour, which is what the study seeks to investigate. As such, the model enables us to investigate how perception of risk of infection and HIV knowledge, influence the use of condoms among youth.

Figure 2.1: Health Belief Model (Hochbaum, 1958)

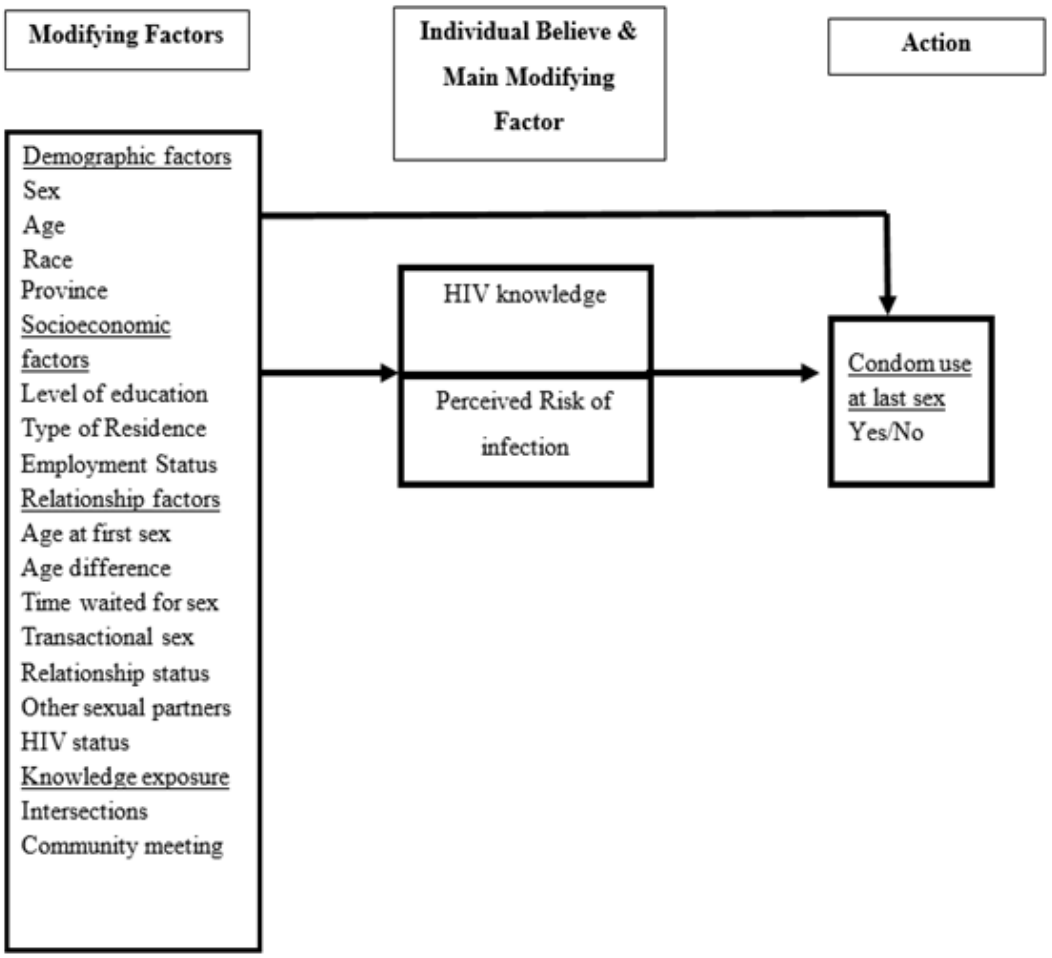


Source: Champion & Skinner, 2008

2.3 Conceptual framework

While the study adopts the Health Belief Model, it does not use all elements of the model. The paper uses the perceived susceptibility of disease being the perceived risk of contracting HIV. It looks at the modifying factors, the main one being HIV knowledge which was measured using the question “can you tell me all the ways that you know that HIV infection can be prevented?”. This study looks at how the other modifying factors influence perceived risk of HIV infection and HIV knowledge, and how they in turn, influence condom use. The study also looks at the direct influence that the modifying factors have on condom use. The other modifying factors are the demographic factors being sex, age, race and province. The socioeconomic factors are level of education, type of residence and employment status. There are also relationship factors being age at first sex, age difference, time waited for sex, transactional sex, relationship status, other sexual partners and HIV status. Lastly there are HIV knowledge exposer factors being Intersections TV series and community meetings on HIV. The study analyses their influence on health behaviour, being condom use in the context of this particular research. According to the Health Belief Model, individuals would use condoms consistently if they perceived their risk of becoming infected with HIV as outweighing the costs of not using condoms and the modifying factors influence one’s perception of risk of HIV infection and the amount of HIV knowledge they have.

Figure 2.2 Conceptual framework adapted from Hochbaum (1958) Health Belief Model



2.4 Statement of hypothesis

On the basis of the literature review, the theoretical and conceptual framework, the following hypothesis was established and tested.

H_o. There is no significant relationship between HIV knowledge, perceived risk of HIV infection and lack of condom use among youth in South Africa.

H_a. There is a significant relationship between HIV knowledge, perceived risk of HIV infection and lack of condom use among youth in South Africa.

Chapter 3: Methodology

3.1 Study Design

The study used a cross sectional study design as it will make use of survey data from the Third National HIV Communication Survey (NCS) of 2012. The NCS data is nationally representative, from a quantitative survey which was conducted between February and May 2012 from the nine provinces in South Africa. The survey aimed to include approximately 10 000 people aged 16-55.

3.2 Survey and Questionnaire

The questionnaire was structured, including a series of 24 questions, about the socio-demographic characteristics, nature of their sexual relationships, HIV perception and prevention, as well as their exposure to HIV communication programmes. The questionnaires were translated from English to the other ten official languages. The interviews were conducted in the home language of the respondents and took approximately an hour and 30 minutes. The validity of the interviews were also checked using a 10% validation check which was done in person or telephonically (Johnson et al., 2013).

3.3 Study population and sample size

The study population comprised of the youth of both sexes between the ages 16-24 who are sexually active and answered the questions about HIV knowledge, perceived risk of infection and condom use. A total of 3396 youth aged 16-24 participated in the study, this included both male and female. From these participants only 1671 answered the question on condom use at last sex and they made up the study population. When the weight was applied the study population became 4 414 415 participants.

3.4 Variable description

Table 3.1 Socio-demographic and relationship factor variables by categories and coding

Variable	Categories	Coding

Dependent Variable		
Condom use at last sex	Yes	0
	No	1
Independent Variables		
HIV knowledge 'Can you tell me all the ways that you know that HIV infection can be prevented?'	High knowledge 'Identified three methods'	1
	Medium knowledge 'Identified 1-2 methods'	2
	No knowledge 'Identified 0 methods'	3
Perceived Risk 'What do you think your chances are of getting infected with HIV?'	Definitely going to get infected	1
	Probably going to get infected	2
	Probably won't get infected	3
	Definitely not get infected	4
Control variables		
Demographic Factors		
Sex	Male	1
	Female	2
Age	16-19	1

	20-24	2
Race	Black	1
	Coloured	2
	White	3
	Indian	4
Province	Eastern Cape	1
	Free State	2
	Gauteng	3
	Kwazulu-Natal	4
	Limpopo	5
	Mpumalanga	6
	North West	7
	Northern Cape	8
	Western Cape	9
Socioeconomic Factors		
Level of education	No Education/primary	1
	Secondary education	2
	Tertiary Education	3

Type of residence	Urban formal	1
	Urban informal	2
	Tribal setting	3
Employment status	Unemployed	1
	Employed	2
	Student	3
Relationship factors		
Age at first sex	17 and older	1
	Younger than 17	2
Age Difference	Younger than partner	1
	Same age as partner	2
	Younger than partner	3
Time waited for first sex	Less than 6 months	1
	More than 6 months	2
Transactional sex	Yes	1
	No	2
Relationship with last sexual partner	Married	1
	Main partner	2

	Friend	3
	Known for a while	4
	Once of thing	5
Knowledge of partners' sexual partners	Yes	1
	No	2
	Don't know	3
Knowledge of partners' HIV status	Yes	1
	No	2
Knowledge exposure		
Intersections television drama	Yes	1
	No	2
Community HIV meeting	Yes	1
	No	2

Table 3.1 shows the dependent, independent variables as well as the control variables, showing their categories and coding of the categories. The dependent variable 'condom use' was created from the question 'did you use a condoms at last sex?'. The category of interest is those who did not use condoms at last sex and was coded as 1. This is because the study is investigating lack of condom use among youth. The main independent variable, being HIV knowledge, was created using the UNICEF definition of HIV knowledge, which defines HIV knowledge as knowing that abstinence, condom use and limiting sex to one partner prevents HIV transmission (UNICEF, 2002). The variable was created

using three variables: abstinence, condom use and limiting sex to one partner. Those who were unable to identify a method of prevention were coded as '0', those who were able to identify one-two methods were coded as '1', and those who were able to identify three methods were coded as '3'. The other variables in the study were not changed.

3.5 Ethical Issues

The study was conducted using secondary data and was not directly involved with the respondents, and because no names are given in the dataset the respondents cannot be connected to the information they gave. As such, anonymity is guaranteed. "Ethical approval for this study was obtained from the University of the Witwatersrand's Human Research Ethics Committee (Nonmedical) and from the Institutional Review Board of the Johns Hopkins University Bloomberg School of Public Health. Several ethical issues were considered in the study design and in administering the survey. Researchers and fieldworkers received extensive training on ethical issues. Gender considerations were addressed by ensuring, as far as possible, that participants were interviewed by fieldworkers of a similar age and gender to the participant" (Johnson et al., 2013:11)

3.6 Data Management

The data was requested from Johns Hopkins Health and Education in South Africa. The variables relevant to the study were managed using the STATA version 12.

3.7 Data analysis

To achieve objective one, which was to give a description of the weighted frequency distribution and levels of condom use, cross tabulations were conducted. A correlation matrix was conducted to see how the variables interact so as to detect if there is multi-collinearity and to assess the direction of the relationship. Non-condom use rates were also calculated to show the distribution of the lack of condom use per 1000 youth.

Below is the formula used to calculate rates for non-use of condoms, which was adapted from crude death rates.

$$\frac{Number\ in\ population}{number\ of\ people\ who\ did\ not\ use\ a\ condom\ at\ last\ sex} \times 1000$$

(Rowland, 2003)

To achieve objective two, which was to investigate the determinants of lack of condom use, a chi-squared test was conducted to investigate whether there is a relationship between the dependent and independent variables. A weighted binary logistic regression was conducted at bivariate level as this would establish the socio-demographic and relationship variables which are significantly associated with lack of condom use.

Below is the formula used for the chi-squared:

$$x^2 = \sum \frac{(Obsrved\ vaule - Expected\ value)^2}{Expected\ value}$$

(Burns & Burns, 2008)

To achieve objective three, which is to investigate the association between lack of condom use, HIV knowledge and perceived risk, an adjusted and weighted binary logistic regression was performed, controlling for socio-demographic and relationship factor variables which influence condom use. A binary logistic regression was employed because the outcome variable, being condom use at last sex, is dichotomous. The category of interest being those who did not use condoms at last sex. The testing of the association was performed at 95% confidence interval and 5% significance level so the results could be statistically significant.

Below is the formula used for logistic regression:

$Li = \alpha + \beta 1X1i + \beta 2X2i + \ldots + \beta kXki + E$

Where: Li = dependent variables

α = constant

βk = regression coefficients

X = independent variables

E= Error

(Burns & Burns, 2008)

Chapter 4: Results

4.1: Descriptive statistics of distribution of condom use at last sex

Figure 4.1: Weighted percentage distribution of condom use last sex among youth aged 16-24, South Africa (2012)

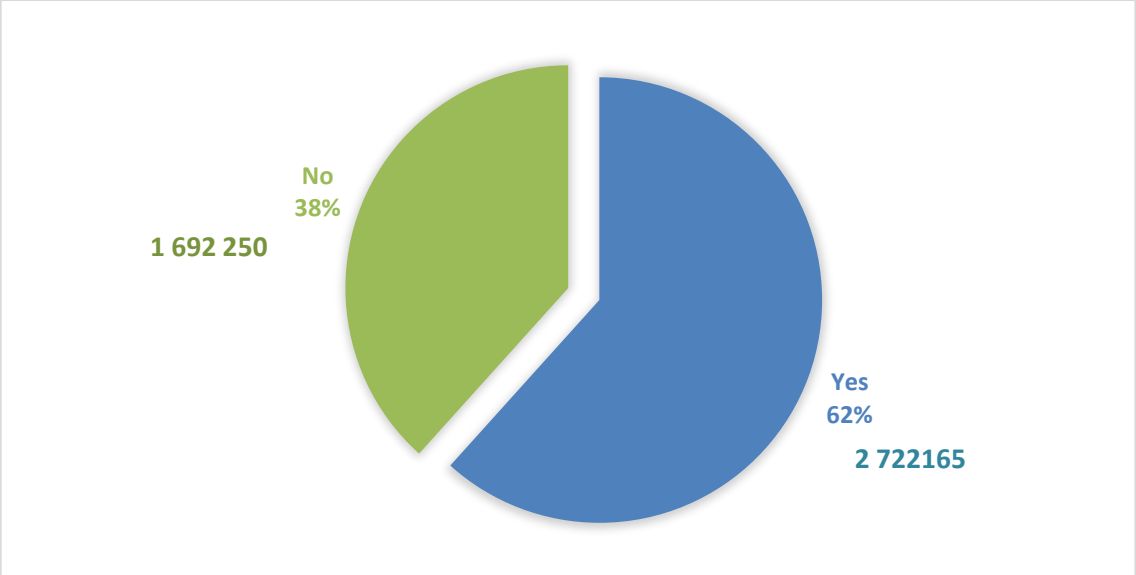


Figure 4.1 shows that 62% [2 722 165] of youth used condoms and 38% [1 692 250] did not use condoms at last sex.

Figure 4.2: Weighted percentage distribution of condom use last sex by sex among youth aged 16-24, South Africa (2012)

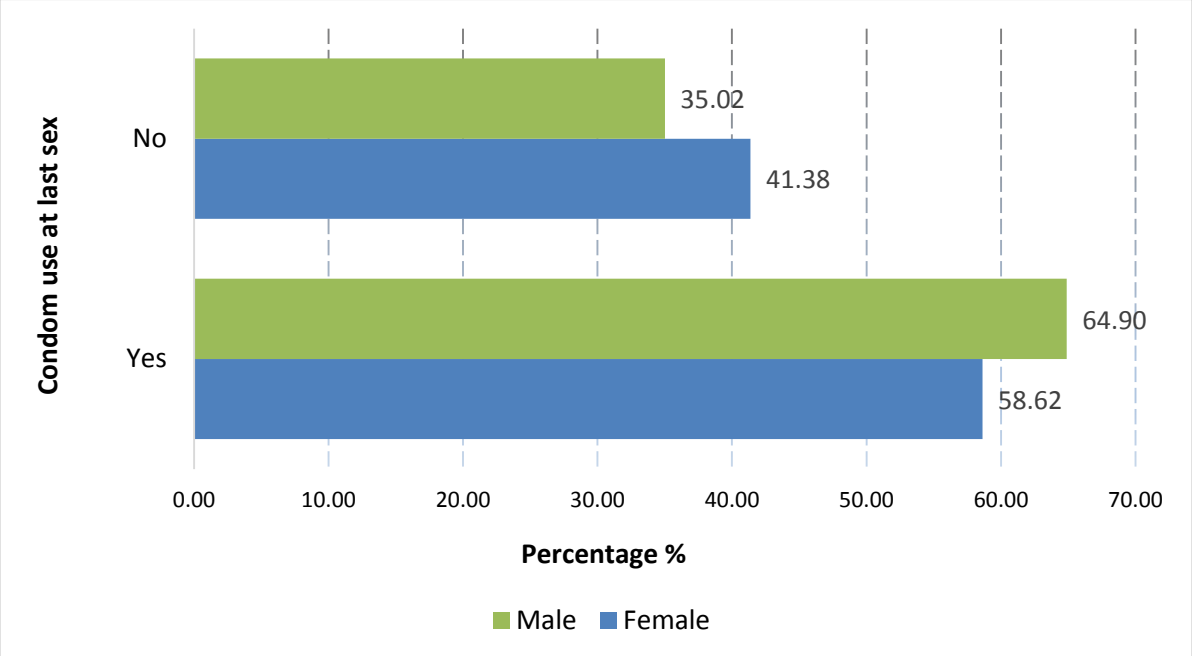


Figure 4.2 shows that more females did not use condoms at last sex [41.38%] in comparison to their male counterparts [35.02%].

Figure 4.3: Weighted Percentage distribution of condom use at last sex by HIV knowledge among youth aged 16-24, South Africa, (2012)

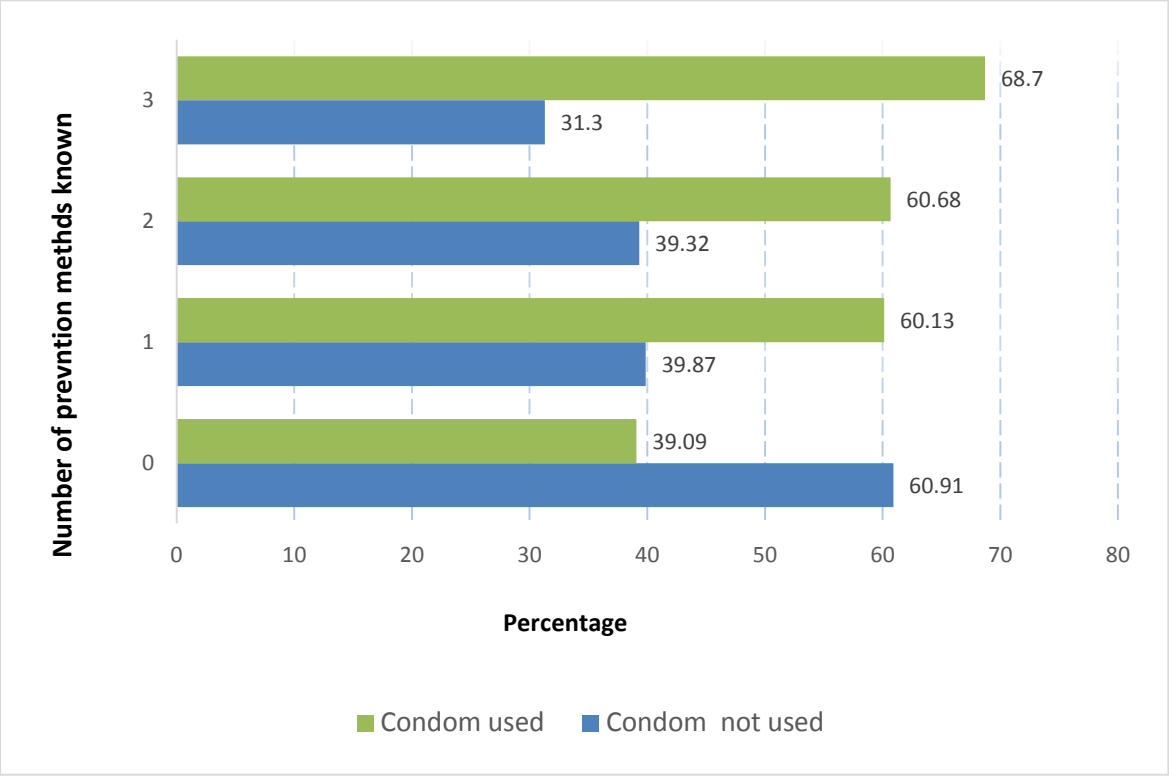


Figure 4.3 shows that among youth who knew no method of prevention, 60.91% did not use condoms at last sex, among those who knew one and two methods of protection, 39.87%, and 39.32% did not use condoms at last sex respectively, and 31.30% did not use condoms at last sex among those who knew three methods of prevention.

Figure 4.4: Weighted Percentage distribution of condom use by perceived risk of HIV infection among youth aged 16-24, South Africa (2012)

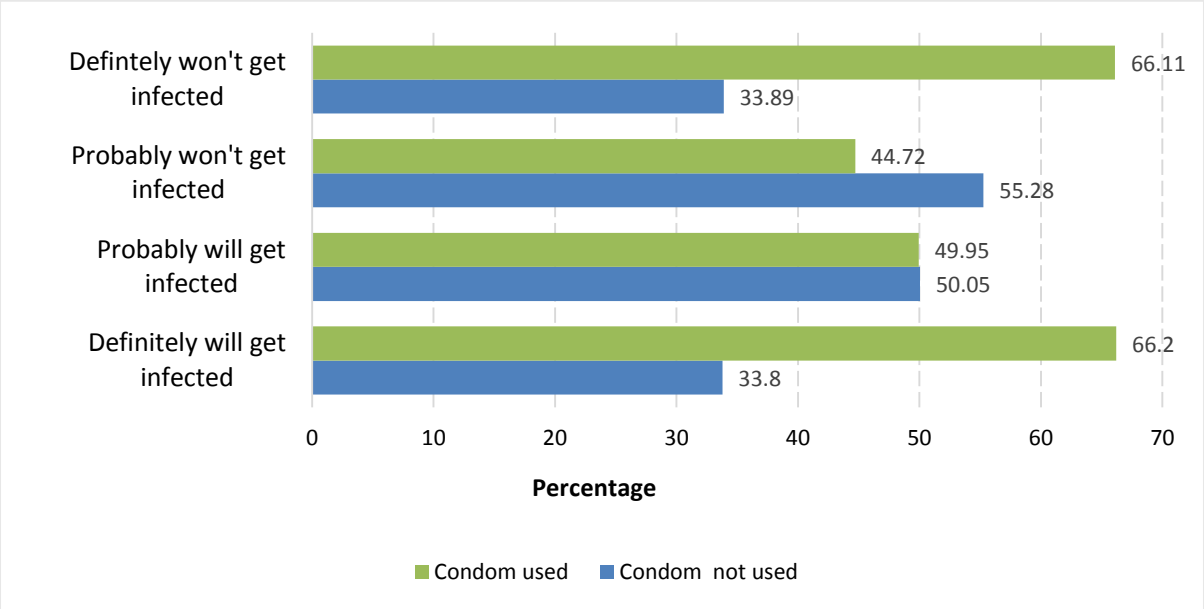


Figure 4.4 shows that among those who thought they would definitely get infected with HIV, 33.80% did not use condoms at last sex. Among those who thought they probably won't get infected and those who thought they probably would get infected, 55.28% and 50.05% did not use condoms at last sex respectively. Among those who thought they definitely won't get infected with HIV, 33.89% did not use condoms at last sex.

Figure 4.5 Percentage distribution of condom use by province among youth aged 16-24, South Africa (2012)

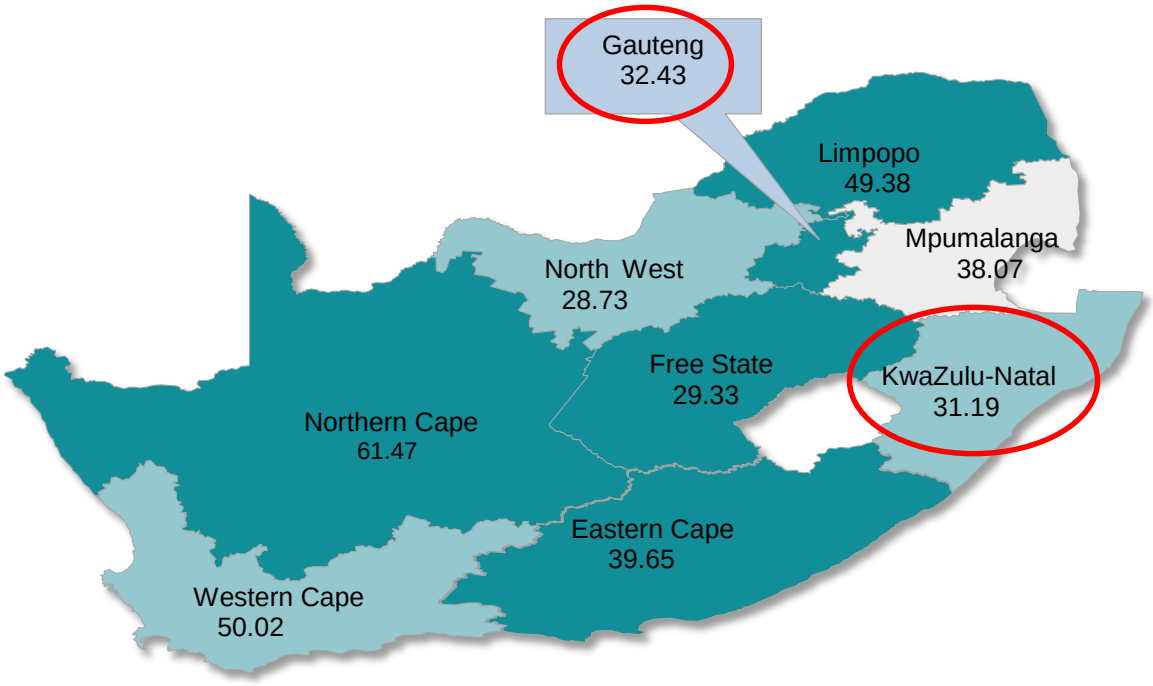


Figure 4.5 shows the distribution of non-use of condoms by province. Northern Cape has the highest percentage of youth who do not use condoms at last sex [61.47%] followed by those living in Western Cape with 50.02%. The province with the lowest percentage of non-use of condoms is North West at 28.71%.

Table 4.1: Weighted frequency and percentage distribution of condom use at last sex by demographic, socioeconomic and sexual behaviour practices among youth aged 16-24.

Condom Use at last sex				
Characteristics	Yes	No	Total	P-value
	Freq. (%)	Freq. (%)	Freq. (%)	
Sex				
Female	1 349 026 (58.62)	952 261 (41.38)	2 301 287 (100.00)	0.000
Male	1 373 139 (64.98)	739 989 (35.02)	2 113 128 (100.00)	
Total	**2 722 165 (61.67)**	**1 692 250 (38.33)**	**4 414 415 (100.00)**	
Age group				
16-19	688 881 (66.81)	342 270 (33.19)	1 031 151 (100.00)	0.000
20-24	2 033 284 (60.10)	1 349 980 (39.90)	3 383 264 (100.00)	

Total	**2 722 165 (61.67)**	**1 692 250 (38.33)**	**4 414 415 (100.00)**	
Race				
Black	2 247 828 (62.81)	1 330 746 (37.19)	3 578 574 (100.00)	
Coloured	198 133 (49.63)	201 073 (50.37)	399 206 (100.00)	
White	242 459 (62.12)	147 866 (37.88)	390 325 (100.00)	0.000
Indian	33 745 (73.87)	12 565 (27.13)	46 310 (100.00)	
Total	**2 722 165 (61.67)**	**1 692 250 (38.33)**	**4 414 415 (100.00)**	
Place of residence				
Urban formal	1 136 111 (65.91)	587 677 (34.09)	1 723 788 (100.00)	
Urban informal	856 014 (60.60)	556 616 (39.40)	1 412 630 (100.00)	0.000
Tribal settlement	730 040 (57.12)	547 957 (42.88)	1 277 997 (100.00)	
Total	**2 722 165 (61.67)**	**1 692 250 (38.33)**	**4 414 415 (100.00)**	
Education level				
No education/primary school	64 779(35.05)	120 021 (64.95)	184 800 (100.00)	
Incomplete secondary	1 028 520 (57.73)	753 116 (42.27)	1 781 636 (100.00)	
Secondary	1 330 027 (68.54)	610 599 (31.46)	1 940 626 (100.00)	0.000
Tertiary	293 302 (59.46)	199 947(40.54)	493 249(100.00)	
Missing	5 537 (39.25)	8 567 (60.75)	14 104 (100.00)	
Total	**2 722 165 (61.67)**	**1 692 250 (38.33)**	**4 414 415 (100.00)**	
Employment status				
Unemployed	1 277 568 (57.02)	962 862 (42.98)	2 240 430 (100.00)	
Employed	417 390 (53.34)	365 115 (46.66)	782 505 (100.00)	
Student	1 007 188 (74.00)	353 854 (26.00)	1 361 042 (100.00)	0.000
Missing	20 019 (65.76)	10 419 (34.24)	30 438 (100.00)	
Total	**2 722 165 (61.67)**	**1 692 250 (38.33)**	**4 414 415 (100.00)**	
Age at first sex				
Younger than 17	1 695 740 (64.36)	938 890 (53.64)	2 634 630 (100.00)	
17 and older	1 026 425 (57.67)	753 360 (42.33)	1 779 785 (100.00)	0.000
Total	**2 722 165 (61.67)**	**1 692 250 (38.33)**	**4 414 415 (100.00)**	
Age difference				

Younger	1 428 515 (59.41)	975 826 (40.59)	2 404 341 (100.00)	
Same age	273 406 (67.28)	132 981 (32.72)	406 387 (100.00)	
Older	1 020 244 (63.74)	580 508 (36.26)	1 600 752 (100.00)	0.000
Missing	0(0.00)	2 935(100.00)	2 935 (100.00)	
Total	**2 722 165 (61.67)**	**1 692 250 (38.33)**	**4 414 415 (100.00)**	
Time waited before first sex				
Less than 6 months	1 587 544 (64.21)	884 815 (35.79)	2 472 359 (100.00)	
More than 6 months	1 134 621 (58.42)	807 435 (41.58)	1 942 056 (100.00)	0.000
Total	**2 722 165 (61.67)**	**1 692 250 (38.33)**	**4 414 415 (100.00)**	
Transactional sex				
No	2 585 379 (62.40)	1 577 679 (37.60)	4 143 058 (100.00)	
Yes	136 786 (50.41)	134 571 (49.59)	271 357 (100.00)	0.000
Total	**2 722 165 (61.76)**	**1 692 250 (38.33)**	**4 414 415 (100.00)**	
Relationship to last sexual partner				
Married	145 912 (33.59)	288 451 (66.41)	434 363 (100.00)	
Main partner	1 816 214 (63.30)	1 052 783 (36.70)	2 868 997 (100.00)	
Friend	318 945 (74.19)	110 977 (25.81)	429 922 (100.00)	
Someone I've known for a while	307 322 (65.57)	133 355 (30.26)	440 677 (100.00)	0.000
Once off thing	105 043 (65.74)	55 148 (34.43)	160 191 (100.00)	
Missing	28 729 (35.79)	51 536 (64.21)	80 265 (100.00)	
Total	**2 722 165 (61.76)**	**1 692 250 (38.33)**	**4 414 415 (100.00)**	
Knowledge of partners HIV status				
Yes	1 314 853 (64.02)	845 845 (35.98)	2 160 698 (100.00)	
No	1 407 312 (57.52)	846 405 (42.48)	2 253 717 (100.00)	0.000
Total	**2 722 165 (61.76)**	**1 692 250 (38.33)**	**4 414 415 (100.00)**	
Intersections Television drama				
Yes	1 281 624 (67.00)	631 138 (33.00)	1 912 762 (100.00)	
No	1 440 541 (57.78)	1 052 693 (42.22)	2 493 234 (56.48)	
Missing	0(0.00)	8 419 (100.00)	8 419 (100.00)	0.000
Total	**2 722 165 (61.76)**	**1 692 250 (38.33)**	**4 414 415 (100.00)**	

Community meeting on HIV				
Yes	423 517 (60.71)	274 142 (39.29)	697 659 (100.00)	0.000
No	2 259 898 (62.52)	1 354 502 (37.48)	3 614 400 (100.00)	
Missing	38 750 (37.85)	63 606 (62.14)	102 356 (100.00)	
Total	**2 722 165 (61.76)**	**1 692 250 (38.33)**	**4 414 415 (100.00)**	

Table 4.1 shows that age group and condom use at last sex have a significant association with a p-value of 0.000. Age group shows that 39.90% of youth aged 21-24 did not use condoms at last sex while 33.19% of those aged 16-19 did not use a condom at last sex. There is a significant association between race and condom use at last sex with a p-value of 0.000. Youth from the Black population group had the highest percentage of lack of condom use at last sex with 50.37 % and Indians had the lowest percentage at 27.13%. The table also shows a significant association between type of settlement and condom use at last sex with a p-value of 0.000. Majority of those who did not use a condom at last sex are from tribal settlements [42.88%].

Education level and condom use at last sex are significantly associated with a p-value of 0.000. The table shows that majority of the youth who did not use a condom at last sex have no education or primary education only [64.95%] and lack of condom use is lowest among those with secondary education [31.46%]. The education variable has 14 104 missing cases. Employment status has a significant association with condom use [p-value 0.000]. Lack of condom use is highest among employed youth with 46.66% of them not using a condom at last sex. Among those who did not use condoms at last sex 57.25% were unemployed. There are 30 438 missing cases from the employment status variable.

There is a significant association between age at first sex and condom use at last sex with a p-value of 0.000. Table 4.1 shows that 55.48% of those who have an age at first sex of 17 or above did not use a condom at last sex. Age difference and condom use at last sex are significantly associated with a p-value of 0.000. Among those who were younger than their partners 40.59% did not use a condom at last sex. Time waited before first sex and condom use at last sex are significantly associated with a p-

value of 0.000. Among those who did not use a condom at last sex 52.29% waited less than 6 months before first sex. Table 4.1 also shows a significant association between transactional sex and condom use at last sex with a p-value of 0.000, those who have transactional sex had a higher percentage of lack of condom use at last sex [49.59%] compared to those who did not have transactional sex [37.60%]. Lack of condom use at last sex is highest among those who are married [66.41] compared to other forms of relationships. Lack of condom use is also higher among youth who do not know the HIV status of their partner [42.48%] in comparison to those who know the HIV status of their partner [35.98%].

Intersections television drama is significantly associated with condom use [p-value 0.000]. 42.22% of youth who do not watch Intersections did not use condoms at last sex compared to 33.00% among those who do watch Intersections. There is a significant association between community meetings on HIV and condom use [p-value 0.000]. Lack of condom use is higher among those who attended community meetings on HIV [39.29] in comparison to those who did not attend the meetings [37.48%].

Table 4.2: Weighted rates of non-use of condoms per 1000 youth by knowledge of prevention methods, perceived risks of infection and demographic variables.

Characteristic	Number in population	Number of condom non-users	Rate per 1000 population
HIV knowledge			
No methods of prevention known	159826	97354	609.12
1 method of prevention known	1 682 652	670 920	398.73
2 methods of prevention known	1 484 585	583 682	393.16
All methods of prevention known	1 087 352	340 294	312.96
Total	**4 414 415**	**1 692 250**	**383.35**
Perceived risk of HIV infection			
Definitely will get infected	271 734	150 202	552.75
Probably will get infected	865 864	433 347	500.48
Probably won't get infected	2 041 813	690 169	338.02
Definitely won't get infected	1 235 004	418 532	338.89
Total	**4 414 415**	**1 692 250**	**383.35**
Sex			
Female	2 301 287	952 261	413.79
Male	2 113 128	739 989	350.19
Total	**4 414 415**	**1 692 250**	**383. 35**
Age group			
16-19	1 031 151	342 270	331.93
20-24	3 383 264	1 349 980	399.02
Total	**4 414 415**	**1 692 250**	**383.35**

Race			
Black	3 578 574	1 330 746	371.86
Coloured	399 206	201 073	503.68
White	390 325	147 866	378.83
Indian	46 310	12 565	271.32
Total	**4 414 415**	**1 692 250**	**383.35**
Type of Residence			
Urban formal	1 723 788	587 677	340.92
Urban Informal	1 412 630	556 616	394.03
Tribal Settlement	1 277 997	547 957	428.76
Total	**4 414 415**	**1 692 250**	**383.35**

Table 4.2 shows that as HIV knowledge increases the rate of non-use of condoms decreases. Among those with no HIV knowledge, 609 per 1000 youth are not using condoms but among those who know all methods of prevention 312 per 1000 youth are not using condoms.

The table shows that perception of risk decreases lack of condom use because among those who think they will definitely get infected 552 per 1000 youth are not using condoms but from those who think they probably will not get infected 338 per 1000 youth are not using condoms.

The results also show that there are more females (413 per 1000) than males (350 per 1000) who are not using condoms and that there are more Coloured people (503 per 1000) than any other race who are not using condoms. Those who live in tribal/ rural settlements (428 per 1000) are more likely to not use condoms than those living in urban formal (340 per 1000) and urban informal settlements (394 per 1000).

4.2 Unadjusted logistic regression model results

Table 4.3: Condom use by perceived risk, HIV knowledge, socio-demographic and sexual behaviour variables.

Unadjusted Model			
Independent Variables	UNADJUSTED ODDS RATIO	P-VALUE	95% CONFIDENCE INTERVAL
Perceived Risk of HIV infection			
Probably won't get infected	RC		
Probably will get infected	*0.81	0.000	0.80 0.81
Definitely will get infected	*0.41	0.000	0.40 0.41
Definitely won't get infected	*0.41	0.000	0.41 0.42
HIV knowledge			
1 method of prevention known	RC		
No methods of prevention known	*0.42	0.000	0.42 0.43
2 methods of prevention known	*0.41	0.000	0.41 0.42
All methods of prevention known	*0.29	0.000	0.28 0.29
Sex			
Female	RC		
Male	*0.73	0.002	0.60 0.90
Age group			
16-19	RC		
20-24	*1.56	0.000	1.23 1.99
Race			
Black	RC		
White	*0.97	0.000	0.30 2.42
Coloured	*1.66	0.000	0.53 4.46
Indian	*0.61	0.000	0.23 3.88
Province			
Eastern Cape	RC		
Free State	0.65	0.076	0.41 1.05
Gauteng	*0.59	0.005	0.41 0.85
Kwazulu-Natal	*0.62	0.010	0.44 0.89
Limpopo	1.25	0.288	0.82 1.91
Mpumalanga	0.69	0.109	0.44 1.08
North West	*0.57	0.030	0.35 0.94
Northern Cape	1.02	0.955	0.47 2.18
Western Cape	1.12	0.570	0.75 1.66
Education level			

No education/Primary	RC		
Incomplete secondary	*0.45	0.002	0.27 0.75
Secondary	*0.31	0.000	0.19 0.52
Tertiary	*0.33	0.000	0.18 0.58
Place of residence			
Urban formal	RC		
Urban informal	*1.28	0.037	1.02 1.62
Tribal settlement	*1.56	0.000	1.21 2.00
Employment Status			
Unemployed	RC		
Employed	1.02	0.890	0.78 1.33
Student	*0.47	0.000	0.37 0.61
Age at first sex			
Older than 17	RC		
Younger than 17	*1.38	0.002	1.13 1.69
Age difference			
Younger	RC		
Same age	*0.63	0.010	1.44 1.89
Older	0.79	0.640	0.64 0 .99
Time before first sex			
Less than 6 months	RC		
More than 6 months	*1.23	0.040	1.01 1.50
Transactional sex			
No	RC		
Yes	*1.49	0.043	1.012 2.20
Relationship to last sexual partner			
Married	RC		
Main partner	*0.35	0.000	0.25 0.50
Friend	*0.21	0.000	0.13 0.34
Someone I've known for a while	*0.22	0.000	0.14 0.34
Once off thing	*0.32	0.000	0.18 0.58
Do you think your partner has other sexual partners?			
Yes	RC		
No	*1.46	0.002	1.15 1.88
Don’t know	0.81	0.177	0.60 1.10
Knowledge of partners HIV status			
Yes	RC		
No	0.82	0.620	0.68 1.01
Intersections television drama			
Yes	RC		
No	*1.65	0.000	1.35 2.01

Community HIV meeting			
Yes	RC		
No	1.15	0.305	0.87 1.51

RC= Reference Category, *=p<0.05 denotes significance as tests were run at a 95% significance level

The main independent variables show that there is a statistically significant association between perceived risk and condom use at last sex. Youth who think they 'probably will get infected' with HIV have a 0.81 reduced odds of not using a condom at last sex than those who think they 'probably won't get infected'. Those who think they 'definitely will get infected' have a 0.41 reduced odds of not using a condom at last sex relative to those who think they 'probably won't get infected' with HIV. Those who think they 'definitely won't get infected' have a 0.41 reduced odds of not using a condom at last sex when being compared to those who think they 'probably won't get infected'. This shows that a low perceived risk of infection is associated with lack of condom use.

HIV knowledge has a statistically significant association with condom use at last sex as all the p-values are 0.000. The unadjusted model results show that those who know no method of prevention have a 0.41 reduced odds of not using a condom at last sex when compared to those who know 1 method of prevention. Those who know two methods of prevention have a 0.41 reduced odds of not using a condom at last sex, while those who know all methods of prevention have a 0.29 reduced odds of not using a condom at last sex when compared to those who know 1 method of prevention.

Males have a 0.73 reduced odds of not using a condom at last sex when compared to females. Youth in the age group 20-24 have a 1.56 increased odds of not using a condom at last sex when compared to those aged 16-19. The odds ratios however tell us that White youth have a 0.97 reduced odds of not using a condom at last sex when compared to Black youth. Coloured youth have a 1.66 increased odds of not using a condom at last sex when compared to Black youth, and Indian youth have a 0.61 reduced odds of not using a condom at last sex when compared to Black youth. Place of residence shows that those who live in tribal settlements have a 1.45 increased odds of not using condoms when compared to those who live in urban formal areas. The province variable shows that youth living in

Gauteng and KwaZulu-Natal have a 0.59 and 0.62 decreased odds of not using condoms at last sex when compared to those living in the Eastern Cape respectively.

There is a statistically significant association between education level and condom use at last sex with the p-values of all categories being below 0.05. The odds ratios tell us that youth with incomplete secondary education have a 0.45 reduced odds of not using condoms at last sex, while those with tertiary education have a 0.33 reduced odds of not using a condom at last sex when compared to those with primary or no education. Those who are students have a 0.47 decreased odds of not using condoms at last sex when compared to those who are unemployed.

Youth who had sexual debut at age younger than 17 have a 1.38 increased odds of not using condoms at last sex than those who had their first sexual debut at age 17 and above. Youth who have transactional sex have a 1.49 increased odds of not using a condom at last sex when compared to those who are not having transactional sex. Youth who have sexual intercourse with their main partner at last sex have a 0.35 decreased odds of not using condoms when compared to those who had sex with someone they are married to.

Youth who did not watch Intersections have a 1.65 increased odds of not using condoms when compared to those who did watch Intersections. Youth who did not attend a community meeting about HIV have a 1.15 increased odds of not using condoms at last sex when compared to those who attended a community meeting about HIV.

4.3 Adjusted logistic regression model results

Table 4.4: Condom use by perceived risk, HIV knowledge, socio-demographic and sexual behaviour variables.

Adjusted Model			
Independent Variables	**Adjusted Odds Ratio**	**P-Value**	**95% Confidence Interval**
Perceived Risk of HIV infection			
Definitely will get infected	RC		
Probably will get infected	0.82	0.410	0.51 1.32
Probably won't get infected	*0.38	0.000	0.24 0.59
Definitely won't get infected	*0.38	0.000	0.23 0.61
HIV knowledge			
No methods of prevention known	RC		
1 method of prevention known	0.72	0.282	0.40 1.31
2 methods of prevention known	0.70	0.234	0.38 1.26
All methods of prevention known	0.63	0.178	0.36 1.21
Sex			
Female	RC		
Male	0.76	0.13	0.53 1.08
Age group			
16-19	RC		
20-24	*1.35	0.046	1.01 1.82
Race			
White	RC		
Black	0.81	0.745	0.25 2.72
Coloured	1.50	0.519	0.44 5.13
Indian	1.87	0.440	0.38 9.12
Province			
Eastern Cape	RC		
Free State	0.93	0.784	0.53 1.53
Gauteng	0.66	0.051	0.44 1.01
Kwazulu-Natal	0.7	0.088	0.42 1.05
Limpopo	1.31	0.304	0.85 2.32

Mpumalanga	*0.58	0.043	0.39 0.98
North West	*0.56	0.045	0.33 0.98
Northern Cape	0.68	0.456	0.26 1.80
Western Cape	0.96	867	0.67 1.66
Education level			
No education/Primary	RC		
Incomplete secondary	0.59	0.06	0.34 1.02
Secondary	*0.41	0.002	0.23 0.72
Tertiary	*0.43	0.011	0.23 0.82
Place of residence			
Urban formal	RC		
Urban informal	1.25	0.09	0.97 1.62
Tribal settlement	*1.45	0.009	1.10 1.94
Employment Status			
Unemployed	RC		
Employed	1.06	0.69	0.79 1.42
Student	*0.62	0.001	0.47 0.83
Age at first sex			
17 and older	RC		
Younger than 17	*1.52	0	1.21 1.92
Age difference			
Younger	RC		
Same age	0.98	0.934	0.64 1.51
Older	1.1	0.601	0.76 1.60
Time before first sex			
Less than 6 months	RC		
More than 6 months	1.19	0.123	0.95 1.50
Transactional sex			
No	RC		
Yes	1.49	0.066	0.97 2.29

Relationship to last sexual partner			
Married	RC		
Main partner	*0.53	0.001	0.37 0.77
Friend	*0.37	0	0.22 0.63
Known for a while	*0.35	0	0.22 0.58
Once off thing	0.52	0.061	0.27 1.02
Do you think your partner has other sexual partners?			
Yes	RC		
No	*1.42	0.017	1.066 1.90
Don't know	0.81	0.211	0.59 1.12
Knowledge of partners HIV status			
Yes	RC		
No	0.9	0.397	0.72 1.14
Intersections television drama			
Yes	RC		
No	*1.36	0.013	1.35 2.01
Community HIV meeting			
Yes	RC		
No	1.06	0.715	0.78 1.73

RC= Reference Category, *=p<0.05 denotes significance as tests were run at a 95% significance level

Youth who think they probably won't get infected with HIV have a 0.82 reduced odds of not using condoms at last sex when compared to those who think they will definitely become infected. Those who think they probably won't get infected have a 0.38 reduced odds of not using condoms at last sex when compared to those who think they will definitely become infected. Those who think they definitely won't become infected have a 0.38 reduced odds of not using condoms at last sex when compared to those who think they definitely will become infected, holding the other variables in the model constant.

Knowing one method of prevention reduces the odds of not using a condom at last sex by 0.72 when compared to not knowing any method of prevention. Knowing two methods of prevention reduces the odds of not using a condom at last sex by 0.70 when compared to not knowing any method of prevention. Knowing all methods of prevention reduces the odds of not using a condom at last sex by 0.63 when compared to knowing no method of prevention, holding other variables in the model constant.

Males have a 0.76 reduced odds of using a condom at last sex when compared to females holding other variables in the model constant. Youth who are aged 20-24 have a 1.35 increased odds of not using a condom at last sex when compared to those who are aged 16-19, holding other variables in the model constant. The race variable shows that Black South Africans have a 0.81 reduced odds of not using a condom at last sex when compared to White South Africans. Youth who live in tribal settlements have a 1.45 increased odds of not using condoms when compared to those who live in urban formal areas holding the other variables in the model constant. The province variable shows that youth living in Limpopo have a 1.31 increased odds of not using condoms when compared to those living in the Eastern Cape holding the other variables in the model constant.

Youth with an incomplete secondary education have a 0.59 reduced odds of using a condom at last sex when compared to those with primary or no education. Youth with tertiary education have a 0.43 reduced odds of not using a condom at last sex when compared to those with primary or no education holding the other variables in the model constant.

Have sexual debut at an age younger than 17 increases the odds of not using a condom at last sex by 1.52 when compared to those who had sexual debut at age 17 and above holding the other variables in the model constant. Having transactional sex increases the odds of not using condoms at last sex by 1.49 when compared to not having transactional sex, holding the other variables in the model constant. Youth whose last sexual encounter was with a friend have a 0.37 decreased odds of having

unprotected sex when compared to those whose last sexual encounter was with the person they are married to, holding the other variables in the model constant.

Youth who did not watch Intersections had a 1.36 increased odds of not using condoms when compared to those who watched intersections holding the other variables in the model constant. Those who did not attend community meetings on HIV have a 1.06 increased odds of not using condoms when compared to those who attended the meetings holding the other variables in the model constant.

Chapter 5-Discussion

5.1 Discussion

HIV knowledge

The main aim of the study was to investigate the association between HIV knowledge, perceived risk of HIV infection and the lack of condom-use among youth in South Africa. One of the main findings of the study is that HIV knowledge is not significantly associated with lack of condom use. The study found an insignificant association however, the odds ratios show that as the number of prevention methods known increase, lack of condom use decreases slightly. The results of the study are aligned with the idea that HIV knowledge does make a difference in condom use even if the difference is modest or not statistically significant. A study conducted by Fonner et al. (2014) found that school-based sex education is an effective intervention for generating HIV-related knowledge and decreasing sexual risk behaviours among participants, including delaying sexual debut, increasing condom use, and decreasing numbers of sexual partners. While this study found an insignificant association between HIV knowledge and condom use Figure 4.3 tells a similar story to that of Fonner et al. (2014) as condom use is higher among those who have HIV knowledge as compared to those who do not.

While this study found that HIV knowledge has an insignificant association with condom use, previous studies such as that conducted by Kincaid et al. (2014), found that HIV awareness campaigns were significantly associated with condom use. However, Kincaid et al focused their study on condom use at sexual debut. This could mean that HIV knowledge is effective at sexual debut but becomes less effective after sexual debut.

The findings of this study are consistent with those of a study conducted by Lammers et al (2013) investigating the influence of HIV knowledge and perceived risk on condom use in sex in Nigeria. The study found that having knowledge of HIV prevention methods is not significantly associated with condom use (Lammers, 2013). Michielsen et al. (2010) also found that HIV intervention programmes such as HIV knowledge dissemination did not lead to sexual risk reduction and this has been attributed

to poor implementation of intervention programmes. For example, teachers may be under-skilled, have limited knowledge or feel uncomfortable in providing sexual education (Mathews et al., 2007; Smith & Harrison, 2013). This could then lead to the quality of HIV knowledge being received being poor or even not being received at all, so while the youth may be able to identify the three main methods of prevention they may have many other misconceptions about the spread and prevention of HIV as a result of receiving information from uninformed and unskilled teachers.

From an ecological viewpoint there are many factors which influence sexual behaviour and not just having HIV knowledge, and in that regard it is logical and expected that intervention programmes which are focused at knowledge will yield little results as far as behaviour change goes (Michielsen et al., 2010). For example while one may know that the use of condoms may be the most effective method to protect themselves against HIV they may find themselves in relationships where they are unable to negotiate condom use. Dietrich et al. (2013) argue that having knowledge is of little benefit when the individual is unable to negotiate condom use. This tells us that while youth may know how to protect themselves from HIV there are barriers to using protection which need to be addressed. It is also important to note that the HIV knowledge may have been gained after unprotected sex. HIV knowledge would be unable to change behaviour if it was only gained after the behaviour occurred.

Perceived risk

The study also found that perceived risk of HIV infection has a significant association with the lack of condom use among youth. The results of the adjusted model in Table 4.4, shows that thinking you are less likely to get infected with HIV, results in an increased likelihood of using condoms.

The results of the study confirm the idea that the way one perceives their risk of becoming infected with a disease is associated with their health behaviour, an idea put forth by the Health Belief Model (Champion & Skinner, 2008). However the Health Belief Model puts forth that those who think they are at risk of infection are more likely to adopt health behaviours to prevent the infection (Champion & Skinner, 2008). In this regard the model expects that those who perceive themselves as not being

at risk of a disease would be less likely to change their behaviour, and those who perceive themselves as being at risk of contracting a disease would be more inclined to change their behaviour and adopt one which would protect them from the disease. In relation to this particular study the Health Belief Model would expect that those who perceive themselves to be at risk of infection to be more likely to use condoms and those who perceive themselves as not being at risk of infection to be less likely to use condoms. However the results of the study show that those who perceive themselves as being at risk of infection are less likely to use condoms than those who perceive themselves as not being at risk. In this regard the results do not follow the expectations of the Health Belief Model. This may be because there are other factors which are inhibiting condom use among youth such as the inability to negotiate condom use, finding condoms undesirable or not having access to condoms. It is however important to note that perhaps those who perceive themselves as not being at risk of HIV infection think this way because they are using condoms and base their risk of infection on the means they have taken to protect themselves from infection.

The finding of the adjusted model in Table 4.4, which shows that thinking you are at risk of infection increases the odds of not using condoms at last sex, are inconsistent with those of a longitudinal study conducted in Cape Town, South Africa. The study was investigating the perception of risk and risky sexual behaviour using sexual debut as an indicator of risky sexual behaviour. The study found that those who perceived themselves as being at a high risk of becoming infected were delaying their sexual debut while those who perceived themselves as not being at risk, debuted earlier (Anderson et al., 2007). The findings of this study are also inconsistent with those of a study conducted in KwaZulu-Natal among married and cohabiting women. The study found that the women's perceived risk of becoming infected by the husband or main partner is positively associated with condom use, meaning that women were able to insist on condom use within marriage and cohabitation because they thought they were at risk of infection (Maharaj & Cleland, 2005).

Sex and condom use

One of the interesting findings of the study was that females are less likely to use condoms than males. Table 4.1 shows that 41.3% of females and 35.02% of males did not use condoms at last sex. According to Jewkes et al. (2010) women who are partners of hegemonically masculine men are at risk of HIV because they are not in control of the circumstances in which they have sex and as a result they are unable to negotiate condom use, and this may be the reason why young women are using condoms less than their male counterparts. With the case of transactional and intergenerational sex, research has shown that females who engage in these types of sexual activities are generally unable to negotiate condom use (Hendriksen et al., 2007; Dietrich et al., 2013). This study also shows in Table 4.4 that youth involved in transactional sex have a 1.49 increased odds of not using condoms when compared to those who are not involved in transactional sex. Interventions which aim to increase condom use among women often fail because the use of condoms in relationships is often controlled be males (Shai et al., 2012). The relationship power inequality limits women's ability to practice safe sex and puts them at risk of pregnancy and contracting HIV (Dietrich et al., 2013). It is thus important to focus on women empowerment particularly in sexual relationships. A study conducted in Nigeria found that married and cohabiting women were unable to insist on condom use despite thinking that they were at risk of being infected by their partner and this was attributed to their lack of bargaining power and culture (Lammers et al., 2013).

Age and condom use

The results of the study also show that condom use declines as age increases. Coital frequency is also higher among the 20-24 age group as opposed to the 16-19 age group (Pettifor et al., 2008). This means that the 20-24 age group is at a higher risk of contracting HIV having unprotected sex more frequently. Table 4.2 shows that the rate of lack of condom use is 331 per 1000 youth aged 16-19, and 399 per 1000 youth aged 20-24. This could be because as age increase people are more likely to be involved in stable relationships or to be married and these types of relationships are associated with

low condom use (Matson et al., 2010). The high rates of condom use among those aged 16-19 however suggests that the initiatives to increase condom use among youth are working (Simbayi et al., 2014).

Race and condom use

The results of this study have shown that the association between condom use and race is insignificant. While the unadjusted model showed a significant association, the adjusted model shows that the association between condom use and race is insignificant. This shows that the association observed in the unadjusted model was as a result of confounding. Studies have shown that it is the social class associated with race which is more of a determining factor for sexual behaviour rather than race itself and this is especially important to consider in the context of South Africa where race and class are so closely linked (Jeannette et al., 2002; Keefe & Wood, 1996).

Place of residence and condom use

Lack of condom use is an issue which needs attention in tribal and urban informal areas. The results have shown that youth living in tribal and urban informal areas have an increased likelihood of not using condoms when compared to those in urban formal areas (1.28 and 1.56 respectively) [Table 4.4]. This could be due to condoms not being easily available particularly in tribal areas where the cost and distance travelled to acquire condoms become inhibiting factors (Bryan et al., 2006). The results have also shown that lack of condom use is high among youth in the KwaZulu-Natal province [Figure 4.4], which may be as a result of gender norms which are social and cultural constructs which dictate how women and men are expected to behave in the province, dictating that women should submit to the men's decision on condom use or the lack thereof (Fladseth, 2015).

Relationship status and condom use

Previous studies have found that married couples followed by those who are in stable relationships are more likely to not use condoms thus putting them at risk of infection especially if there are multiple sexual partners (Lammers et al., 2013 ; Hendriksen et al., 2007). The results of this study are consistent with these findings. Table 4.4 shows youth who have sexual intercourse after knowing each other 'for

a while' have a 0.65 decreased odds of not using condoms at last sex, when compared to those who are married.

Education status and condom use

Formal education may be regarded as more important than HIV knowledge and awareness because education is significantly associated with lack of condom use but HIV knowledge is not. The results also show that youth with tertiary education have a 0.43 decreased odds of not using condoms when compared to those who have no education. This could be because having education enables the women to be more financially independent and have more decision making powers in relationships as compared to their counterparts with less education (Pettifor et al., 2008). Women who are more educated are also less likely to be involved in risky relationships which involve transactional sex or are intergenerational because they have a better income and they are more likely to use condoms in comparison to their less educated peers (Pettifor et al., 2008).

Knowledge of partners' HIV status and condom use

The results show that among those who did not know their partners' HIV status, 42.48% did not use condoms at last sex as compared to 35.98% who did not use condoms among those who know their partners' HIV status [Table 4.1]. This shows that lack of condom use is higher among those who do not know their partners' HIV status. It has been established by Bachanas et al. (2013) that when an individual discloses their HIV status they are more likely to learn their partners' HIV status. It has also been established that women are less likely to disclose their HIV status (Bachanas et al., 2013). This could also mean that the youth are unable to correctly gauge their risk of infection because they do not know their partners' status and engage in risky behaviour from an optimistic bias position. A study conducted by Fals-Stewart et al. (2003) found that 71% of wives were not aware that their husband had recently engaged in either unprotected intercourse with another partner or risky needle injection, in this regard they would be unable to correctly gauge their risk of infection associated with having unprotected sexual intercourse with their husbands. Previous literature has shown that people tend

to not consider their partners' behaviour when calculating their risk of being infected with HIV (Longfield et al., 2002). In the case of South African youth it may be that they simply do not consider their partners' behaviour and only consider their own when assessing their risk of HIV infection or they are unaware of their partners' risky sexual behaviour

Exposure to HIV interventions and condom use

In addition to the school based HIV education, multimedia platforms have been used to deliver HIV information to the public. While the results were not statistically significant this study has found that youth who were not exposed to the television drama 'Intersections' in the past 12 months had an increased odds (1.36) of not using condoms at last sex when compared to those who had been exposed to the television programme. This could mean that the television drama has been successful in changing risky behaviour among youth and has led them to take up the use of condoms. When looking at the youth who did not attend community meetings about HIV, we see that they have a 1.06 increased odds of not using condoms when compared to those who attended the meetings. It should however be noted that this was not statistically significant. These results show that the television drama is more than the community meetings. These findings are similar to those of Peltzer et al. (2012) who found that exposure to multimedia intervention programmes was more effective at protecting against HIV than face-to-face interventions.

Chapter 6- Conclusion and recommendations

6.1 Conclusion

The hypothesis of this study was that '*There is no significant relationship between HIV knowledge, perceived risk of HIV infection and lack of condom use among youth in South Africa.'* The study found that the relationship between HIV knowledge and condom use was insignificant but the relationship between perceived risk of HIV infection and condom use was significant. This mean that part of the hypothesis will be accepted and part will be rejected. The study accepts that there is no significant association between HIV knowledge and condom use among youth but it rejects that there is no significant association between perceived risk of infection and condom use.

The results of the study show that more needs to be done to encourage condom use among youth because the knowledge focused intervention programmes, such as the school based life skills programmes, which were incorporated into the curriculum by the Department of Education, have had minimal success. The study has shown that, despite having HIV knowledge and thinking they are at risk of infection, youth are not using condoms, which means that they continue to be at risk of infection of HIV and other sexually transmitted diseases.

The results of this study can give a better understanding of condom use among youth, in doing so it will benefit programmes such as The National Strategic Plan on HIV, STIs and TB 2012 – 2016, which aims to prevent new infections. The prevention of new infections will be beneficial for youth in that it will decrease the prevalence of HIV and other sexually transmitted diseases.

It is important to note that investing in HIV knowledge was not a misplaced investment. Understanding how HIV is transmitted plays a vital role in the uptake of measures of prevention. However, as shown by the study, this is merely the foundation of combating risky sexual behaviours, and more still needs to be done to adequately address the issue.

6.3 Recommendations

6.3.1 Future studies

With regard to future studies, a longitudinal study is recommended. Using longitudinal data would overcome the limitation of a temporal sequence because it would be able to show which occurred first between the dependent and independent variable, thus showing causality.

In addition, a follow up qualitative study is recommended to better investigate the barriers to condom use which exist despite having HIV knowledge and understanding individual perceived risk of HIV infection. Understanding the barriers to condom use would help intervention programmes better address the issue. This study has been unable to fully capture this because of its quantitative nature.

This study investigated condom use at an individual level looking at variables which affect the individual directly, being HIV knowledge and perceived risk of infection; the results have however shown that this is not enough to tackle the issue of condom use. It is recommended that condom use be studied using a multi-level approach addressing factors that influence condom use from the individual level coupled with interpersonal, family and community level.

6.3.2 Policy and programme recommendations

This study found that there is no association between HIV knowledge and condom use, however there is an association between perceived risk and condom use. Based on this finding it is recommended that programmes which have been knowledge focused, start incorporating perception of risk.

The state has been making efforts to tackle the issue of lack of condom use among youth, however research has pointed to the need for parents to also step in and share the responsibility of fostering condom use (Manisi et al., 2013). Mansini et al. (2013) found that parent-offspring communication on sexual issues had a positive effect on condom use among youth in Sub-Saharan Africa, youth who interact with their parents about sex related issues are also more confident and assertive and are able to negotiate condom use. Discussing condoms with parents may also be a form of social marketing, creating a culture of condom use thus making youth more comfortable with condoms and more likely

to use them (Shai et al., 2010; Dietrich et al., 2013). It is thus recommended that intervention programmes such as 'the family matter programme' looks into ways of encouraging parent-offspring interaction on sex related issues though community based programmes, particularly in rural areas where the study has found condom use to be low.

In addition to parent-offspring interaction, it is recommended that more be done to highlight the importance of knowing your partners' HIV status and encourage communication and disclosure about HIV status between partners. This can be done by expanding on programmes such as 'First things First' which is a campaign targeted at students with the aim of increasing condom use and has introduced grape flavoured condoms as a means to make condoms more appealing to the youth (SANAC, 2015). Programmes such as 'first things first' should address the importance of knowing your partners' status. This study has shown that youth generally don't know their partners' HIV status and they engage in unprotected sex despite not knowing their partners' HIV status.

It is highly recommended that policies invest in empowering females. This study has found that females are less likely to use condoms when compared to their male counterparts. This empowerment can be done through education and employment because this will reduce behaviours which foster unprotected sex such as transactional sex, and intergenerational sex.

This study also found that condom use is low among youth who are married, and those in relationships spanning longer than six months. It is thus important to create awareness about the dangers of not using condoms in these relationships which are assumed to be monogamous. Intervention campaigns have focused on individuals who do not have regular sexual partners leaving those who are married or in long term relationships at risk. Married people, or those in long term relationships, may find themselves at risk of infection because of the partner's infidelity, and as such condom use within marriage should be encouraged.

The South African government distributes state provided condoms freely in public spaces to increase accessibility. However in areas where there are no facilities such as libraries and recreational centres,

distribution of condoms becomes hindered. The Department of Education has allowed for schools to independently decide whether or not they will distribute condoms on their property, however many schools have decided not to in fear of being perceived as encouraging sexual intercourse among students (Beksinska et al., 2013). It is recommended therefore that the Department of Education takes this under revision and consider making the distribution of condoms in high school mandatory. This study has found that youth in rural and urban informal areas are less likely to use condoms when compared to those in urban formal areas. This may be an access issue and previous literature has shown that difficulty to access condoms is a significant predictor of HIV infection, so increasing access to condoms in these areas through schools would help increase condom use (Peltzer et al., 2012).

6.3 Limitations

6.3.1 Temporal sequence

The issue of temporality is a limitation to the study, because the study used cross-sectional data making it very difficult to establish the temporal sequence of the dependent and independent variables. As a result, only an association can be established, and not causality. This is particularly problematic for the study as it was unable to establish whether youth's perception of risk was influencing their condom use or whether the condom use was influencing the perception of their risk of infection. The issue of temporality also inhibited the study from establishing whether the HIV knowledge came before or after the unprotected sex.

6.3.2 Desirability bias

The data is based on self-reporting and because lack of condom use is a very sensitive topic, especially to young people, it makes the study prone to desirability bias. People may give false information reporting to have used condoms at last sex even if they have not.

6.3.3 Underreporting

Underreporting is also a limitation in this study as the data shows that a lot of respondents chose not to respond to the question of condom use at last sex. Despite these limitations, the findings of the study can be regarded as reliable and valid.

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Appendix 1. Correlation matrix was conducted to investigate the type of correlation between condom use at last sex and the independent variables.

Appendix 1: Correlation matrix of condom use at last sex by perceived risk, knowledge of prevention methods socio-demographic and sexual behaviour variables among youth aged 16-24, South Africa, (2012)

	Condom use	Perceived risk	HIV knowledge	Type of settlement	Employment status	Education status	Age at first sex	sex
Condom use	1							
Perceived risk	-0.1216	1						
HIV knowledge	-0.0501	-0.0315	1					
Settlement	0.0833	-0.0538	-0.0508	1				
employment status	-0.1375	0.0357	0.0384	-0.0416	1			
Education	-0.1114	0.044	0.0939	-0.186	0.0726	1		
Age at First sex	-0.0793	0.0292	-0.0105	-0.0112	-0.0188	0.1295	1	
Sex	-0.0734	0.0502	-0.015	-0.0772	0.0707	0.001	-0.1831	1
Race	0.0639	0.2057	-0.0406	-0.1712	-0.0188	0.0079	0.002	0.0578
Time waited before sex	0.0478	0.03	-0.0212	0.0016	0.0139	0.0188	0.1213	-0.0868
Age diff	-0.0529	0.0329	-0.025	-0.0386	0.0442	-0.0075	-0.0939	0.7624
Relationship status	-0.1367	0.0145	0.0485	-0.0757	0.0451	-0.0058	-0.0653	0.2418
Age group	0.0855	-0.0195	0.0035	-0.02	-0.3315	0.1476	0.1859	0.0187
Other partners	-0.0993	-0.0359	-0.0247	0.0146	-0.0066	-0.0481	0.0356	-0.0308
HIV status	-0.0413	-0.1606	-0.0797	0.0815	0.0541	-0.109	-0.1008	0.1586
transactional sex	0.0465	-0.0437	0.0353	0.1021	-0.0327	0.0069	-0.0039	-0.0246

Race	Time before sex	Age difference	Relationship status	Age group	Other partners	Partners HIV status	transactional sex
1							
0.0578	1						
0.0354	-0.124	1					
0.0617	-0.1289	0.201	1				
-0.0242	-0.0134	0.0786	-0.0967	1			
-0.1197	-0.0521	-0.0119	0.0748	-0.0289	1		
-0.0744	-0.1477	0.1558	0.2037	-0.0945	0.1161	1	
-0.0699	-0.0391	-0.0213	0.0419	0.0247	-0.0068	0.0147	1

Appendix 1 shows that perceived risk and education level have the strongest correlation with condom use at last sex. The table also shows that the correlation between condom use at last sex and the independent variables perceived risk, HIV knowledge, sex, education and age difference is negative. The correlation between condom use and the independent variables age group, settlement, race, time waited before sex and transactional sex is however positive