

**HIV RELATED RISK BEHAVIORS IN SOUTH AFRICAN RURAL
COMMUNITY**

**DISSERTATION FOR THE MASTERS DEGREE IN
RESEARCH PSYCHOLOGY**

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Declaration

I, Nemuramba Rathani, declare that the dissertation hereby submitted to the University of Limpopo as partial fulfillment for the degree of Master of Arts in Research Psychology, has not previously been submitted by me for a degree at any other university, that it is my own work in design and execution, and that all the material contained therein has been duly acknowledged.

Signed atOn the
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Dedication

I dedicate this study to my mother Nemuramba Mashudu Julia. You played a significant role of bringing me to the world and raising me to be a responsible woman, with love. I also dedicate this study to my daughter, Angel Munangiwa Mbulaheni.

Acknowledgement

First of all I thank God for making everything possible for me, setting such a task in my heart and making me finish it successfully

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Abstract

This study measures the relationship between the AIDS risk reduction model (ARRM) variables associated with HIV related risk behaviours on learners from a South African rural community. A cross-sectional study was conducted using 308 learners in a Limpopo rural high school to identify HIV risk behaviours. Data were analyzed using binary logistic regression to test the usefulness of ARRM variables in predicting sexual risk. Sexual risk was measured as; (a) vaginal sex without a condom, (b) anal sex without a condom (c) number of sexual partners in the last twelve months and (d) time taken before having sex with a new partner. Two of the ARRM variables, that is perceived susceptibility and sexual response efficacy, were found to be the most important predictors of HIV related risk behaviours. There is an argent need for effective preventive activities in rural areas, especially through school-based interventions.

Key words:

ARRM

HIV

HIV prevention

Risk behaviors

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CHAPTER 1

1.1 INTRODUCTION

AIDS is a severe manifestation of HIV infection. There is presently no cure for it, and prevention is difficult, especially among rural populations where it is also spreading rapidly (Kalipeni & Ghosh, 2006). In the face of this reality, researchers and HIV/AIDS workers concur that effective educational efforts motivating behavioural change are the best means of slowing the spread of HIV (Lanier & Gates, 1996).

HIV in Africa spreads primarily through unprotected sex. This means that changes in sexual behaviour, particularly the adoption of safe sex practices such as condom use, can reduce the spread of HIV significantly. Yet, several studies indicate that, because sexual behaviour involves complex dynamics, condom use is not an easy option for many people on the continent (Moore & Oppong, 2006). Although condoms reduce the risk of HIV transmission, their use remains low among sexually active teenagers. It is thought that 85% of the South African HIV epidemic is caused by unprotected sexual intercourse (Mantell, Harrison, Hoffman Smith, Stein & Exner, 2006). The other transmission methods, such as transmission from mother to child, and less frequently, transmission associated with blood products account for the rest of the infections.

Rural adolescents and young adults have higher rates of HIV-related sexual risk behaviours and they may not see the importance of practicing HIV risk reduction behaviours, thus increasing their risk for HIV infection (Morisky, Ang, Cory & Tiglao, 2004). Effective education targeting high-risk groups should be based on empirical assessments of theoretical models that show promise to modify behaviour. The aids risk reduction model (ARRM) is one such theoretical tool (Lanier & Gates, 1996). The model has been successfully used to guide the investigation of psychosocial factors related to HIV risk behaviours and it has

been used to predict sexual risk-related behaviours among African American adolescents and adults (Winningham, Corwin, Moore, Richer, Sargent & Felton, 2004). It remains to be seen if it will work equally well outside of the US, where it was originally formulated. This study tests the ARRM to see if its variables are associated with HIV risk behaviours. The ARRM provides a more comprehensive understanding of the process of behaviour change (Flowers, Sheeran, Smith & Beail, 1997). This model builds upon and moves beyond the components of the health belief model (HBM) and the theory of reasoned action (TRA) (Flowers, Sheeran, Smith & Beail, 1997). It is necessary to examine the impact of the ARRM with various individuals, since models such as the ARRM may tell us quite different things, depending on which social group we are dealing with. According to Catania, Coates and Kegeles (1990), most people choose to engage in behaviours they believe will yield the greatest overall personal value (cf., Lanier & Gates, 1996).

The complexity and diversity of the HIV epidemic is known to be driven by many behavioural, social, and biological factors that facilitate the spread of HIV. It is unlikely that society will be able to keep up with the demand for health and social services unless there is a significant slowing down in the incidence of newly infected individuals. This situation underscores the central role and importance of HIV prevention (National Department of Health, 2008). Reducing or eliminating high-risk behaviours is the only way to limit further spread of HIV.

Effective prevention programmes should be based on models and theories of risk behaviour so that the programmes can be designed to change those particular factors leading to undesirable risky behaviours (Boyer & Kegeles, 1991). ARRM is presented as an example of such a social-psychological model. The ARRM characterizes why people carry on engaging in high risk activities or make efforts to alter those activities. According to the ARRM, behaviour change takes place through three stages, namely; labeling, commitment, and enactment. It is not clear if the model will function effectively in a South African rural context.

1.2 BACKGROUND TO AND MOTIVATION OF THE STUDY

1.3 Problem statement

HIV is increasing rapidly in rural areas because of risky behaviours that people engage themselves in. There are many studies conducted on HIV but few of them focus on factors influencing the rise of HIV in rural areas. Behaviours that increase the risk of HIV among the youth living in rural areas have been reported to be as frequent as those of lower socioeconomic minority groups living in large, urban areas (DuRant, Ashworth, Newman, McGill, Rabun & Baranowski, 1992). Therefore, it is necessary to study effective ways of behaviour change in South African rural settings.

Research can be designed according to the requirements of the ARRM. However, some studies have found mixed results when examining the ARRM (Conner, Stein & Longshore, 2005). It is important to test this model with various populations because different results can be obtained depending on which social group is being investigated (Lanier & Gates, 1996). The ARRM is a theory-based representation of psychosocial processes by which people may attempt to change their HIV risk behaviour (Longshore, Anglin & Hsieh, 1997).

1.4 Aim

The aim of this study was to investigate a model based on the ARRM amongst rural learners to see if it can predict sexual risk behaviours.

1.5 Objective

To examine the usefulness of the ARRM variables in predicting sexual risk behaviours among learners in a rural South African context.

1.6 Research Question

The study is designed to answer the question whether the ARRM variables (perceived susceptibility, HIV/AIDS knowledge, peer behaviour, self-efficacy, sexual response efficacy, condom use self-efficacy, behaviour intentions and intrinsic reward) are able to predict the sexual risk behaviours among rural learners in South Africa.

1.7 Need for the study

The high incidence of HIV infection among the youth has created a need to improve the understanding of factors influencing sexual risk-taking behaviours and to design effective prevention programmes (Koniak, 2006). According to the National Institute of Health in the USA, AIDS is increasing rapidly in rural areas than in any other segments of the population (Smith & Diclemente, 2000). I expect the same trends to hold in South Africa. One strategy for developing effective intervention programmes in Africa requires testing the ecological applicability of theoretical models developed by scientists in other societies (Astatke & Serpell, 2000).

To prevent the HIV infection from spreading further in rural areas, the design and implementation of appropriate HIV risk reduction models is urgently needed (Smith & Diclemente, 2000). Only a few studies have used the ARRM to test the pathways to risky behavioural changes in rural areas and evidence regarding its (the ARRM's) constituent factors is mixed. The high rate of HIV infection among African adolescents and the absence of African-based behavioural theories lead policymakers to adapt Western theories to African settings when developing theory-based HIV-prevention programmes (Conner, Stein & Longshore, 2005).

The ARRM has been used in different populations in the USA, such as , bisexual men, women, and substance abusing populations (Malow, McMahon, Peipman &

Jennings, 2002). Only a few studies have examined ARRM variables as predictors of HIV risk behaviours and none of the studies have tested this model in South African rural communities to see if it can predict HIV risk behaviours in these communities (Malow, McMahon, Peipman & Jennings, 2002). Although there are programmes such as peer education programmes that teach people about HIV and the risk of being infected by the virus, people still continue to engage themselves in behaviours that put them at risk of contracting HIV. This study will explain why people keep on engaging themselves in risky sexual behaviours, thus putting themselves at risk of contracting HIV.

CHAPTER 2

2.1 Operational definition

Sexual Risk Behaviours: Behaviours in which people engage themselves in that can cause them to contract HIV. These behaviours include not using condoms when having sex, having more than one sexual partner, and injecting drugs,

2.2 Abbreviations

ARRM	=	AIDS Risk Reduction Model
AIDS	=	Acquired Immune Deficiency Syndrome
HBM	=	Health Belief Model
HIV	=	Human Immune Virus
SCT	=	Social Cognitive Theory
STI	=	Sexually Transmitted Illness
TRA	=	Theory of Reasoned Action
UNAIDS	=	United Nations programme on HIV/AIDS

2.3 Theoretical framework

Various models have been used to examine adolescents' HIV risk behaviour. They include the Health Belief Model (HBM), the Theory of Reasoned Action (TRA), and Social Cognitive Theory (SCT). In addition to these, the ARRM has also been proposed, and it is of interest in this study. In this section, I will make a brief presentation of some of the available models of behaviour change, since they preceded the ARRM and influenced it.

The HBM is a model that uses attitudes and beliefs of an individual to predict behaviours. It was developed in the context of public health promotion by Irwin Rosestock and Stephen Kegeles in 1966, to explain the lack of public participation in the health screening and prevention programmes (Ajzen, 2002). The HBM proposes that beliefs about susceptibility to HIV and the benefits and negative consequences of performing preventive acts are associated with HIV (Astatke & Serpell, 2000). However, the relations between most HBM constructs have been inconsistent and the relationship among the key variables in the model has never been adequately addressed. So this model generally has not been tested as a fully integrated multivariate model (Fisher & Fisher, 2000). The HBM failed to produce the information on whether the variables that are related to HIV preventive behaviour make contribution to the prediction of HIV preventive behaviour (Fisher & Fisher, 2000). The HBM does not incorporate the influence of social norms and peer influences on people's decisions regarding their health behaviors especially when dealing with adolescents on HIV/AIDS issues (Family Health Research unit, 2002).

The TRA is a model of the psychological determinants of volitional social behaviour that has proven useful in various studies (Fisher & Fisher, 2000). It was developed by Martin Fishbein and Icek Ajzen in 1975. The TRA proposes that an individual's performance of a given behaviour is primarily determined by a

person's intention to perform that behaviour (Ajzen, 2002; Grizzell, 2003). This intention is determined by two major factors: the person's attitude towards the behaviour (i.e., beliefs about the outcomes of the behaviour and the value of these outcomes) and the influence of the person's social environment or subjective norm (i.e., beliefs about what other people think the person should do, as well as the person's motivation to comply with the opinions of others) (Grizzell, 2003).

The TRA further proposes that people who believe that the use of condoms lead to positive outcomes and prevents negative outcomes are more likely to have a positive attitude toward using condoms (Fisher & Fisher, 2000). According to the TRA, attitudes and subjective norms are regarded as the predictors of intentions (Fisher & Fisher, 2000). The TRA has been successfully applied in efforts to predict, understand and change HIV preventive behaviour (Fisher & Fisher, 2000). But because this theory did not address the issue that an individual may also lack control over HIV preventive action, it can not be tested as the multivariate model (Astatke & Serpell, 2000).

The SCT has been successfully applied in a variety of domains, and Albert Bandura, its developer, has used it in the area of HIV prevention (Fisher & Fisher, 2000). Bandura argued that telling people to use condoms is not enough for the prevention of HIV risks, but he emphasizes that people have to know what causes their risks, and that they must be able to remind themselves that safer behaviour is important for their health (Fisher & Fisher, 2000). Even though the SCT was supported as a behaviour change model for some unhealthy behaviors, it cannot be used as an integrated multivariate model because its interrelations remain unspecified (Cochran & Mays, 1993). The relationship between stages was also not clear (Family Health Research unit, 2002).

The ARRM was designed to be an improvement on existing models. I will be testing its effectiveness in understanding the factors that influence AIDS risk

avoidance. I will examine the ARRM's applicability to a sample of rural learners. The purpose of the study itself is to see if the model can be useful in predicting HIV risk behaviours in a South African rural context. My discussion will be based on reviews such as Lanier and Gates (1996), Fisher and Fisher (2000), and Astatke and Serpell (2000), who have elaborated sufficiently on the model. The reason I choose the ARRM is that this model brings together concepts from a number of influential models, including the HBM and the TRA. This model offers an effective understanding of the factors that influence AIDS risk avoidance (Lanier & Gates, 1996).

The ARRM was developed by J.A Catania to examine HIV risk behaviours and for preventive behaviour (Lanier & Gates, 1996). The model holds that there are three different stages of behaviour change. The first stage is recognition that the behaviour an individual engages in puts one at risk for contracting HIV. The second stage is the development of a conscious commitment to behavioural change. The third step is acting on the commitment to change (Conner, Stein & Longshore, 2005).

When an individual labels his/her risky behaviours as being a problem, three elements are necessary: knowledge about how HIV is transmitted and how it is prevented, perceiving oneself as susceptible to HIV and believing that HIV is undesirable. Factors such as a need for denial and avoidance, fear, anxiety, and other aversive emotions can have effects on labeling (Fisher & Fisher, 2000). This stage seeks to determine if the respondent's behaviour places him or her at risk for HIV infection (Lanier & Gates, 1996).

The second stage, called commitment, focuses on measures of aversive emotions and social influences (Lanier & Gates, 1996). Commitment is essentially a decision making stage in which one has to decide on using condoms in every instance of sexual intercourse (Martin, 2006). According to Catania, Coates and Kegeles (1990), commitment decisions are based on a consideration of the

perceived psychological and social costs and benefits of the high and low risk behaviours (Fisher & Fisher, 2000). The perceived benefits of making change (self-response) and self-efficacy (a person's perceived ability to implement recommended health practices) are included (Lanier, & Gates, 1996). This stage seeks to determine if a person expects to do something (such as using condoms anytime he/she has sex) next time. The final stage is enactment, in which an individual acts on the decision that he or she made during the commitment stage. Knowledge of how a person contracts HIV, its symptoms, and its consequences, is regarded as a factor that influences perceived infection risk, which occurs in stage 1. Self-efficacy is hypothesized as a predictor of both commitment to behavioural change at stage 2 and behaviour change at stage 3, among people who are already at stage 1 (Conner, Stein & Longshore, 2005). Each stage includes a number of concepts identified in prior research as important for engaging in 'healthy' or low risk behaviours (Boyer & Kegeles, 1991).

The ARRM has been empirically examined with a number of at-risk populations (Conner, Stein & Longshore, 2005). Boyer and Kegeles (1991) have theoretically linked the ARRM with adolescents' sex risk and prevention. Most assessments of the ARRM have supported the basic premises proposed by the model. Mallow, McMahon, Peipman and Jennings (2002) found that higher levels of self-efficacy and communication skills affected safe sex choices as predicted by the ARRM (cf., Lanier & Gates, 1996). The ARRM also provides a framework for explaining and predicting the behavior change efforts of individuals in relation to the sexual transmission of HIV/AIDS (Family Health Research unit, 2002).

CHAPTER 3: Literature review

The study aimed at testing the AIDS risk reduction model (ARRM). This chapter will discuss ARRM variables which are: perceived susceptibility, HIV/AIDS knowledge, peer behaviour, self-efficacy, sexual response efficacy, behaviour intentions and intrinsic reward. This chapter will also synthesize the available literature of HIV, HIV risk among young people, and prevention strategies. This study is conducted because South Africa urgently needs HIV prevention interventions that can be disseminated for use in clinical and community settings. A brief theory-based HIV risk reduction counseling intervention originally developed in the USA was adapted for use in a South African sexually transmitted infection clinic in 2005 (Kalichman, Cherry, Cain, Magubane, Bidla, Shasha, Nibe, Kekana, Simbayi & Mathiti, 2005).

There are more HIV-infected people living in South Africa than in any other country in the world, with a national HIV prevalence of 11.4% (Pettifor, Rees, Steffenson, Madikizela, Macphail, Vermaak & Kheinschmidt, 2004). Worldwide, the fastest growing age group of HIV-infected people is the youth. HIV prevalence from the South African Department of Health's annual antenatal survey showed that in 2003, the rates of HIV seropositivity at antenatal testing for 15, 16- and 17-year-olds were 8.5%, 9.4%, and 12.5%, respectively. The 2004 data showed that prevalence rates among 15-year-olds had risen to 10% (Jaspan, Berwick, Myer, Mathews, Flisher, Wood & Bekker, 2006). In 2006, HIV rates among teenage girls decreased from 15.9% to 13.7% but effective ways to reduce the spread of HIV in significant numbers are needed (Noble, 2007). Some rural areas in South Africa showed an increase in HIV prevalence from 2006 to 2007. Limpopo province was one of the provinces that showed an increase in HIV infection from 2006 to 2007. Although there was some decline in HIV prevalence among women under 15-19 years old in 2007 as compared to 2005, we can not say that HIV prevalence is decreasing because it only decline with a slight number and the survey was only done in antenatal clinics (Noble, 2007). Since the World

Health Organization set up its global programme on AIDS, those in charge of this programme, in agreement with most public health officials are stressing that information and education are the most important aspects to control HIV (Van Campenhoudt, Guizzardi & Hausser, 1997). Encouraging responsible behaviour by providing full information on the subject can also be an effective means of preventing the transmission of the virus.

However, in spite of the advancement of technology in the medical field, there is no significant discovery for the cure for the HIV virus that causes AIDS. The rate at which the HIV/AIDS is spreading is so alarming that drastic and revolutionary measures in research should be taken and encouraged (Pötsönen & Kontula, 1999). Looking back after twenty years since the first case of HIV/AIDS was discovered, one wonders what next if by the next ten to twenty years a cure is not discovered. Statistically, 39 million adults and children are living with HIV/AIDS as at the end of the year 2000. Concerning infected adults, 47.3% are women. Since the beginning of the epidemic there have been millions of Aids deaths all over the world (Christian, 2003).

According to the US National Institute of Health, AIDS is rising rapidly in rural areas (Smith & Diclemente, 2000). Recent data suggest that rural teens may be more than twice as likely as their same-age urban peers to be sexually active (Erbelding, Stanton, Quinn & Rompalo, 2000). Coincidentally, rural prevalence also continues to rise. As the majority of the African population is living in rural areas, the number of HIV infections that occur in rural areas is large (Munguti, Grosskurth, Newell, Senkoro, Mosha & Hayes, 1997). South Africa has a serious HIV/AIDS problem with millions of South Africans living with the disease (Olive, 2007). There is therefore a need to study models that can be used to prevent HIV infections in the rural areas of South Africa.

In this study the ARRM was tested to find out if it can predict sexual risk

behaviours in South African rural communities. Pettifor (2005) suggested that programmes for youth must continue to promote partner reduction, consistent condom use and promote treatment for sexually transmitted infections, while also addressing contextual factors that make it difficult to implement behaviour change (Pettifor, Rees, Kleinschmidf, et al. 2005). A major issue in South Africa is what types of interventions are appropriate and most effective for young people. HIV/AIDS prevention strategies for young people in South Africa have become mired in an increasing polarized global debate about abstinence versus condom use which does not seem to be helping in the prevention of HIV (Mantell, Harrison, Smith, Stein & Exnr, 2006).

The applicability of theoretically based models such as ARRM is needed so that prevention interventions can be effective to limit HIV infections. Catania, Coates & Kegeles, (1990), suggested that finding ways of reducing the time span between stages should be a major focus of the public health programmes. They also mentioned that other ways of accomplishing the goal of reducing HIV risk behaviours is to provide programmes that incorporate information and instruction to specific stage of the change process which can be done through psychosocial model (ARRM). The process of translating a Western HIV risk reduction counseling session use in South Africa may provide a model for future prevention technology (Mathiti, Shasha, Jooste, Kekana, Nibe, Kalichman, Bidla, Magubane, Cain, Cherry, Simbayi, 2005).

Effective prevention in communities requires the use of theoretical models in intervention activities to be aligned with overarching national strategies. Over the next few years, South Africa will increase the spectrum of HIV/AIDS interventions, and effective community based strategies require an environment that enables individuals to make decisions that change behaviours towards safe sex practice (Graham, 2007). Testing the ARRM in South Africa will help community organizations to benefit from knowledge and understanding of health promotion models in developing interventions that are tailored to community

contexts (Vanwyk, Strebel, Peltzer & Skinner, 2006).

There is a need to understand behaviours that put the youth at risk of HIV/AIDS, and to develop and implement appropriate interventions to limit the spread of HIV/AIDS (Taylor, Dlamini, Kagoro, Jinabhai & Devriest, 2003). Young people should be at the centre of strategies to control HIV infection (Prata, Morris, Maziwe, Vahidnia & Stehr, 2006). Adequate programmes including media campaigns and quality sex education for both in-school and out of school youth can provide important information that would likely enhance young people's ability to correctly assess their risk of HIV infection (Prata, Morris, Maziwe, Vahidnia & Stehr, 2006).

The applicability of this Western-based theoretical model (the ARRM) will facilitate the rapid adaptation of effective HIV/STD prevention intervention programmes to countries at the early stages of the AIDS epidemic. Applying or adapting best practices into different cultural settings may be a cost-effective approach to HIV prevention in developing nations, which often struggle with a lack of resources to combat the AIDS epidemic (Cochran & Mays, 1993). Although many HIV/AIDS education and prevention programmes in South Africa attempt to reach a wide range of individuals (e.g., males and females; sexually experienced and inexperienced, and individuals from different population groups), it is suggested that education and prevention programmes should pay even more attention in developing culturally sensitive ways to reach youth (Anderson, Beutel & Brown, 2007). Prevention programmes need to acknowledge that the way individuals perceive themselves at risk varies for groups defined by both race and gender. HIV/AIDS education and prevention programmes in South Africa should take into account how the experiences and specific social situations of youth may influence their attitudes, perceptions and behaviours (Anderson, Beutel & Brown, 2007).

The AIDS epidemic continues to grow in this country and around the world.

Currently, the only hope of stopping this tragedy is through interventions that change the behaviour of individuals (Tompson, 1996). In South Africa the prevalence of HIV was growing fast from 2001 to 2005 (Olive, 2007). With millions of people across the continent already infected, the HIV/AIDS epidemic is a major health concern facing countries of sub-Saharan Africa. Although awareness and knowledge about HIV and AIDS are high among adolescents in South Africa, this has not translated into substantial behaviour change (Hartell, 2005). Determining a people's level of HIV/AIDS knowledge and their concerns about their behaviour is an excellent first step. People may be knowledgeable on HIV transmission risk, yet unable to make use of this information in evaluating their own risk. So these theoretical models can help people understand what needs to be done in order to prevent HIV. For example this model will show them that if regard themselves as susceptible to HIV, they can prevent themselves from engaging in risky behaviours (Miller & Rollnick, 1991). Although knowledge about HIV/AIDS is high in most places, in some rural areas they still lack knowledge of HIV transmission. There is therefore an urgent need for behavioural interventions targeted to young South Africans living in the most economically disadvantaged areas (Simbayi & Kalichman, 2005).

The ARRM was very useful early in the epidemic to identify individual behaviours associated with higher rates of HIV transmission. ARRM continues to provide important guidance to interventions in forming design and evaluation with diverse populations (King, 1999). It is important, however, to pay particular attention to this theory across cultures and genders. Numerous studies have proven the usefulness of this theory, and it has become increasingly evident (King, 1999). The ARRM argues that to avoid HIV infection people who engage in high risk behaviours must perceive their sexual behaviours as risky for HIV infection (Catania, Coates & Kegeles, 1990). The ARRM variables are described below.

3.1 Perceived susceptibility

Perceived susceptibility is a person's perception of the likelihood of contracting a disease. Perceived susceptibility holds a central position in psychological models of health behaviour. There is a significant relationship between perceived susceptibility and knowledge. Although knowledge about HIV infection and risk behaviours is important, some people feel that they are not vulnerable to HIV infections, and people are consequently unlikely to reduce their high risk behaviours. Previous research indicate that higher perceived vulnerability about personal risk is linked to greater intended and actual sexual behaviours change (Eaton, Flisher & Aarob, 2003). It was also found that young people in South Africa do not perceive themselves as vulnerable to HIV infections (Eaton, Flisher & Aarob, 2003). Perceived susceptibility has been proven to have a greater role in understanding different people's perceptions of whether their sexual behaviours place them at high risk or not (Catania, Coates & Kegeles, 1990).

3.2 HIV/AIDS knowledge

HIV AIDS knowledge is about having information on safer behaviors, prevention of HIV and knowing all sexual activities associated with HIV transmission (Family health Research unit, 2002). Knowledge of behaviors that transmit HIV is important for the prevention of the spread of HIV. In the 1990s over 90% of young South Africans knew that AIDS is a fatal, sexually transmitted disease. However, they did not understand the nature of HIV, the mechanisms of transmission and methods of prevention (Eaton, Flisher & Aarob, 2003). Previous studies also found that there is uncertainty about the proper use of condoms in South Africa. If people know that condoms prevent HIV infections, this knowledge can be facilitated to make a decision to use condoms.

3.3 Peer behaviour

Peer pressure has to do with proving manliness and believing that having many sexual partners improves a young man's status and admiration by other boys (Eaton, Flisher & Aaro, 2003). For girls, pressure sometimes comes from those who have already experienced sex by excluding those who had never experienced it from group discussions because they are considered still children (Eaton, Flisher & Aaro, 2003). Peer pressure does not have the same negative influence on all youth. Individuals differ in their susceptibility and young men appear to be influenced to a greater extent than are young women. Peer pressure is also not necessarily a negative influence. Positive examples set by friends and role models can promote safer sexual behaviours (Eaton, Flisher & Aaro, 2003).

3.4 Self-efficacy

Self-efficacy is the person's perception that one has the ability to engage in activities that produce a desired outcome (Cochran & Mays, 1993). Previous studies found that a belief in ability to perform behaviours predicts intentions to change risky behaviours to and engage in healthy behaviours (Thomas, Barkley & Burns, 2000). It was found that high self-efficacy helps people to reduce high risk behaviours and engage in low risk activities (Catania, Coates & Kegeles, 1990).

3.5 Sexual response efficacy

Sexual response efficacy refers to the perceived effectiveness of recommended health practices (Sorensen, Wermuth, Gibson, Choi, Guydish, & Batki, 1991). Sexual response efficacy influences peoples' efforts to reduce risky behaviours and promotes prevention efforts (Cochran & Mays, 1993). Response efficacy differentiates between people engaging in high risk behaviours and low risk behaviours, and predicts people who reduce high risk sexual actions (Catania, Coates & Kegeles, 1990).

3.6 Behaviour intentions

Behaviour intentions are the prevention activities developed or implemented to promote positive changes in behaviours, to reduce HIV transmission and infection. Behavioural interventions are effective in reducing unprotected sex and increasing condom use among a variety of at-risk populations (Rural center for AIDS/STD prevention, 2007). Interventions to reduce unprotected sex include individual counseling, social and behavioural support (Johnson, Diaz, Flanders, Hill, Malow & McClellan 2003). High-risk sexual behaviours among adolescents lead to sexually transmitted diseases (STDs) and infections of HIV/AIDS (American Psychological Association (2006). Research is needed to identify which behavioural strategies are most effective in reducing transmission, and which intervention components are most effective in influencing those behaviours (American Psychological Association, 2006).

3.7 Intrinsic reward

An intrinsic reward is when people feel well about themselves after accomplishing something (Stanton, et al. 2004). Most young people engage in risk because of sexual pleasure and men are the ones found to engage in risky sexual behaviours such as having multiple partners because they think the experience is fun. Young men in South Africa regard having multiple sexual partners as boosting their status and ego. Most young men think using condoms during sexual intercourse reduces the pleasure of sex (Eaton, Flisher & Aaro, 2003).

In this study I will be testing the AIDS Risk Reduction Model (ARRM) to see if its variables are associated with HIV risk behaviors. The ARRM is the most domain specific and sophisticated model of the adoption of safer behavior available at present (Flowers, Sheeran, Smith & Beail, 1997). The ARRM has

more understanding of the process of behavior change (Flowers, Sheeran, Smith & Beail, 1997). This model builds upon and moves beyond the components of the HBM and TRA (Flowers, Sheeran, Smith & Beail, 1997). It is seen to be necessary to examine the impact of the ARRM with various individuals, since models such as the ARRM may tell us quite different things depending on which social group we are dealing with. It is also important to test the ARRM in South African context to develop effective prevention programs.

Effective prevention programs should be based on models and theories of risk behavior so that the programs can be designed to change those factors which lead to the undesirable risky behaviors (Boyer & Kegeles, 1991). Further work is needed to examine constructs of the model, and this study is aimed at testing the ARRM to see if it can predict sexual risk behaviours in a South African rural community. The ARRM worked well in other parts of the world, so it is left to see if it can also predict HIV risk behaviors in South Africa.

CHAPTER 4: Methodology

4.1 Research methodology

4.1.1 Research design

The present study is a cross-sectional research design.

4.1.2 Sample

In choosing the participants, the convenient sampling method was used. Convenient sampling is a method of choosing subjects who are available or easy to find (Forzano, 2008). The population included high school learners in rural areas. The researcher approached school authorities for access into the school. The study was announced in class and learners were asked to volunteer as subjects. Those learners who were available to participate were given questionnaires to complete.

4.2 Research variables

The variables used in this study were the ARRM variables chosen from different previous studies that have been conducted by other researchers in the US and in other parts of the world. I will be testing these variables to see if they can predict HIV risk behaviors in South Africa. Below, these variables are presented according to the different stages of the ARRM.

4.2.1 Independent variables:

Labeling stage variable

Perceived susceptibility

HIV/AIDS Knowledge

Peer behaviour

Commitment stage variables

Self-efficacy

Sexual response efficacy

Enactment stage variables

Behaviour intentions

Intrinsic rewards

4.2.2 Dependent variables:

Vaginal sex without a condom

Anal sex without a condom

Number of sexual partners in the last twelve months

Time taken before having sex with a new partner.

4.3 Measures

The questionnaire was developed to measure HIV-specific concepts hypothesized, according to the ARRM, to be influential in predicting HIV risk behaviours. These include: (a) perceived susceptibility; (b) HIV/AIDS knowledge; (c) peer behaviour; (d) self-efficacy; (e) sexual response efficacy; (f) behaviour intentions, and (g) intrinsic rewards. Therefore, the questionnaire used in this study contained 7 scales from the ARRM, items asking for demographic information (age, marital status, education, etc.), and HIV risk-behaviour questions. The scales are explained immediately below.

4.3.1 Perceived susceptibility

The perceived susceptibility scale is a self-report measure of an individual's perceived vulnerability to HIV infection (Eaton, Flisher & Aaro, 2003). It was developed by Dehart and Birkimer (1997). The scale was used in an American study of older women in rural communities. Low perceived personal vulnerability is a risk factor because it reduces the motivation to take sexual precautions. South African research indicates that higher perceived vulnerability and anxiety about personal risk is linked to sexual behaviour change (Eaton, Flisher & Aaro, 2003). The perceived susceptibility scale has a reliability of .84, as calculated with the Chronbach alpha (Dehart & Birkimer, 1997).

In this study perceived susceptibility was measured with the four-item scale developed by Dehart and Birkimer (1997). One of the items is 'I am at risk for HIV/AIDS'. Reliability estimates using the Chronbach alpha was $\alpha = 0.77$ (Winningham, Corwin, Moore, Richter, Sargent & Felton, 2004). The final scores were reversed, so that a high score suggested that the participant is experiencing low susceptibility. In this study the reliability could only reach $\alpha = .278$. Item-to-total correlation showed that the problematic item was "my sexual experiences do not put me at risk for HIV/AIDS", which was negatively correlated to the total score. When the item was removed, Chronbach alpha reached $\alpha = .777$.

4.3.2 Self-efficacy

The self-efficacy scale was developed by Matthias Jerusalem and Ralf Schwarzer in 1981 and has been translated into many languages (Schwarzer & Jerusalem, 1995). Responses are made on 4-point, Lickert-type response scales. The scale has been used internationally with success (Darke, Hall, Heather, Ward & Wodak, 1991). Studies have shown that it has high reliability and construct validity (Schwarzer & Jerusalem, 1995). It was used in the study of HIV risk behaviour among ethnically diverse adolescents living in low income housing developments

(Sikkema, Brondino, Anderson, Felton, Kelly, Winett, et. al., 2004). The scale achieved a high reliability, with Chronbach alpha coefficients of up to $\alpha = .87$ (Sikkema, Brondino, Anderson, Felton, Kelly, Winett, Heckman, & Roffman. 2004). In this study, self efficacy was measured with two items, with responses ranging from 1-4, where 1 = strongly agree and 4 = strongly disagree. One of the items in the present study was ‘‘I can persuade my partner to use a condom during sex even if he/she doesn’t want to’’. The scale demonstrated a fairly low reliability of .40 as measured by the Chronbach alpha.

4.3.3 Peer behaviour

Peer behaviour scale is a five-item measure assessing the proportion of close friends or peers who discussed HIV related risk behaviours including condom usage (Winningham, Corwin, Moore, et al. 2004). Peer pressure has to do with proving manliness and having many sexual partners improves a young man’s status and admiration by other boys (Eaton, Flisher & Aaro, 2003). For girls, pressure sometimes comes from those who have already experienced sex by excluding those who had never experienced it from group discussions because they are still children (Eaton, Flisher & Aaro, 2003). The peer behaviour scale was used in the study of sexual risk among older African American women in rural communities and it demonstrated a strong Chronbach alpha reliability of 0.80 (Winningham, Corwin, Moore, et al. 2004). In the previous study, peer behaviour scale was measured with four items and had a strong reliability of 0.80 Chronbach alpha (Conner, Stein & Longshore, 2004). In the present study this scale was measured with two items. Responses were given on a 1-4 likert type scale where 1=strongly agree and 4= strongly disagree. The items were, ‘‘my friends are not using condoms when they have sex’’ and ‘‘my friends are not being careful about sex and the risk of AIDS’’. Both items were reverse scored. The scale revealed a strong reliability of $\alpha = .72$.

4.3.4 HIV/AIDS knowledge

HIV/AIDS knowledge scale was used in a USA study testing the ARRM among high- and low HIV risk seekers (Conner, Stein, & Longshore, 2004). HIV/AIDS knowledge was used in the previous study with four items, and the reliability was 0.087 (Lanier & Gates, 1996). In the present study this scale was also measured with four items with responses of yes/no. The items used in the present study include the following item: “mosquitoes can give you aids”. The reliability in this study was $\alpha = .36$.

4.3.5 Behaviour intentions

The behaviour intention scale was developed by Warshaw and Davis in 1992 (Davis & Warshaw, 1992). It was used in studying HIV risk behaviours among ethnically diverse adolescents in low income housing development; the internal consistency was $\alpha = .81$, which means the scale has a high reliability (Sikkema, Brondino, Anderson, Felton, Kelly, Winett, Heckman, & Roffman. 2004). In the present study this scale was assessed with four items with response done using a three step scale consisting of “yes, ‘no”, and ‘not at all”. Items include “I take special precautions”, and “I demand the use of condom for self-protection and partner’s protection”. The Chronbach alpha for the present study was $\alpha = .59$.

4.3.6 Sexual Response Efficacy

The sexual response efficacy scale was used in the study of mediators of HIV risk among African American men. The scale demonstrated a satisfactory reliability, with a Chronbach alpha of $\alpha = .67$ (Malow, McMahon, Peipman & Jennings, 2002). In this study the sexual response efficacy scale was measured with three items, with responses ranging from “strongly agree” (1) to “strongly disagree” (4) (Lanier & Gates, 1996). One of the items in the present study was “I can persuade my partner to use a condom during sex even if he/she doesn’t want to”.

One item did not have a high item-total correlation, and was therefore deleted. The item is “If infected I would not tell any sex partner, or anyone.” The scale demonstrated a rather low reliability of $\alpha = .40$ with the exclusion of the problematic item.

4.3.7 Intrinsic Rewards

The “intrinsic rewards” scale has been used in several studies related to intrinsic motivation and self regulation (Stadler & Hlogwa, 2002). The reliability of this four-item scale was determined by coefficient alpha and the overall consistency was $\alpha = .85$ (Markland, Ryan, Tobin & Rollnick, 2004). This scale was used in the study of HIV/STD risk behaviours and perceptions among rural-to-urban migrants in China, and the Cronbach’s alpha in that study was $\alpha = .64$. In the present study this scale was measured with four items, two of them are “a man with multiple sexual partners is cool”, and “many people who have extramarital sex just want to indulge themselves and seek stimulations?”. Ratings were given on a 1 - 4 likert type scale where 1= strongly agree and 4= strongly disagree. The Chronbach alpha for the scale in this study is $\alpha .49$.

4.5 Method

4.5.1 Data Collection procedure

The researcher administered questionnaires to Nyadzani High School learners in Muledzhi, a village in the Limpopo province. The necessary procedures were followed to secure permission to conduct a study in the school. For instance, the researcher applied to the Limpopo Department of Education asking for permission to conduct a study in the mentioned school. When permission was granted, local school authorities at the school level were approached.

Learners completed the self-administered questionnaire in their classrooms during a regular class period. Learners who missed class on the day of the survey administration were excluded. The questionnaire was administered in English by the researcher, and learners were informed that participation in the study was voluntary.

4.5.2 STUDY SAMPLE

The sample was drawn from Nyadzani High School in Muledzhi. The area where the school is situated is rural. Learners from grade 8 to 12 were invited to participate in the study. None of the students who were asked to participate refused to participate and students who missed class on the day of data collection were excluded from the study. The sample consisted of 308 learners, 53.9% (166) of whom were male and 46.1% (142) were female. The sample age range was 13-28 ($\bar{X} = 17.56$; $SD = .490$). Regarding their marital status, most of them were single (283; 92.8%). None of the learners were divorced or separated. Among the 308 participants, 138 (48.7%) reported having sexual partners and 145 (51.4%) never had sexual partners ($\bar{X} = 1.04$, $SD = 1.58$). The description of the sample follows table 1 below.

Table 1: Demographic information (N = 308)

Mean age = 17.56 (SD = .490)		
	n	%
Gender:		
Male	166	53.9
Female	142	46.1
Marital status:		
Married	15	4.9
Single	283	92.8
Cohabiting	7	2.3
School grade:		
Grade 8	63	20.8
Grade 9	63	20.5
Grade 10	64	20.8
Grade 11	66	21.4
Grade 12	51	6.6
Sex partners:		
0 partners	145	51.4
1-9 partners	138	48.7
Religious affiliation:		
Christianity	277	90.8

Table 1 continue

	n	%
Judaism	4	1.3
Islam	1	.3
Other religion	23	7.5

Chapter 5: Results

5.1 Plan of analysis

The researcher used the SPSS (Statistical Package for the Social Sciences), a well-known software for statistical analysis. The questionnaire data were coded and entered into the SPSS. Data were checked for accuracy of entering, and missing values were replaced by the mean. The researcher computed the risk levels to find out how many people were at risk and how many were not. Binary logistic regression analyses were conducted and data was computed to compare the independent variables with the selected HIV/AIDS risk behaviours. The independent variables (perceived susceptibility, self efficacy, peer behaviour, behaviour intentions, HIV/AIDS knowledge, intrinsic rewards and sexual response efficacy scale) were used in a regression model to predict their usefulness in predicting each of the risky behaviours (dependent variables; multiple sexual partners, vaginal sex without a condom, anal sex without a condom and having sex with a stranger). The analysis determined which variables are important in determining the reduction of risk behaviours, and how much variance each of the models accounts for.

5.2 Preliminary analysis

Table 2 below shows the level of HIV risks in different age groups and genders, school grades, marital status and sexual partners. Risk level was computed into a "no-risk", "1-risk", "2-risks", "3-risks", and "4-risks" levels. Some of the learners who were found to be at no risks and those who fell under the risk 1 were considered to be at lower HIV risks. Those who fell under risk 2, 3 and 4 were considered to be at higher HIV risks.

Learners aged eighteen were one hundred and fifty-eight and only five were not at risk. One hundred and thirty-three (43.3%) of them were at risk 1, thirty two at risk 2, eight were at risk 3 and none of them was found to be at risk 4. Amongst the 18-20 year olds, one hundred and six learners participated and only one learner was not at risk, and forty three were at risk 1, forty at risk 2, fifteen at risk 3, and seven were found to be at risk 4. Those who were >20 years were few, 2 of them were at no risk, eleven at risk 1, seventeen at risk 2, twelve at risk 3, and only one was found at risk 4. Learners between ages of 18-20 are the ones who have higher risk behaviours as compared to the other two age groups.

Among three hundred and eight learners who participated in this study, fifteen were married. I found that all of the married learners were at HIV risk. However, they were removed from further analysis because they had different reasons for engaging in HIV risk behaviours, which are not the main focus of the present study. For interest's sake, among the married learners, two were at risk 1; ten at risk 2, and three at risk 3. Among the single learners, eight were not at any HIV risks, one hundred and sixty three were at risk 1, seventy six at risk 2, twenty-nine were at risk 3, and seven were at risk 4. Seven of the 308 learners were cohabitating, none of these was not at HIV risk, but one learner was at risk 1; three at risk 2; two at risk 3, and one at risk 4. The analysis found that the cohabitating learners were at a higher level of HIV risk behaviours as many of them were at risk 2, 3, and risk 4.

Male learners appeared to be the at higher HIV risk than female learners. Female learners appeared to have fewer sexual partners as compared to males. Of the one hundred and sixty-six male learners, only 3 were not at any risk for HIV. Eighty-one of them were at risk 1; five at risk 2; twenty three at risk 3, and seven at risk 4. As compared to the males, five of female learners were not at HIV risk, eighty-six at risk 1; thirty eight at risk 2; twelve at risk 3, and one was found to be at risk 4. Compared with women, more men reported engaging in sexual risk activities such as having multiple sexual partners. Learners were questioned about their life

time sexual partners. Seventy-seven learners reported that they only had one sexual partner. Amongst them two were at no risk, thirty-five at risk 1, thirty at risk 2, ten at risk 3, and none were at risk 4. Sixty of these learners had two and more sexual partners, and among them, only two were not at HIV risk. Eleven were at risk 1; thirty six at risk 2; fifteen at risk 3, and three at risk 4. This means that the more sexual partners these learners appear to have, the more they are at higher risk of contracting HIV.

Data was collected from grade 8 to grade 12, but most of the learners were found in grade 8, 9 and 10. In grade 8, sixty-four learners participated in the study, and amongst them, four were at no risk; forty-four at risk 1; eleven at risk 2; five at risk 3, and none of the grade 8 learners were at risk 4. From grade 9, sixty-three learners participated, and only one was not at HIV risk, forty-four learners were at risk 1, ten at risk 2, five at risk 3 and three were found to be at risk 4.

From grade ten, sixty-four learners participated and only one learner was found to be at no risk, twenty-nine at risk 1; eight at risk 3, and no was one found to be at risk 4. In grade 11, sixty-six learners participated and all of them were at risk, with twenty nine of them at risk 1, twenty six at risk 2, eight at risk 3, and none was at risk 4. From grade 12, fifty-one learners participated. Some appeared to be at no risk, but twenty-four reported to be at risk 1, seventeen at risk 2, seven at risk 3, and one at risk 4.

HIV risk behaviours were assessed with four items; the use of condoms for vaginal intercourse, the use of condoms for anal intercourse, multiple sex partners, and duration of sex with a new partner. Learners who reported to be at no risk were those who used condoms consistently for vaginal and anal intercourse. Those who are at risk 1 and more are those who have multiple sex partners, who have sex with a new partner in a day or within a month, and who use condoms sometimes or do not use condoms at all.

Participants view themselves at no risk for HIV, with 61.7% saying they are not. Learners were found to be having low knowledge about HIV, with 38% still saying that AIDS can be caught from kissing and 18% saying that they cannot get AIDS by sharing needles. Peer influence seems to be a little high among participants, with 58.5% reporting that their peers do not use condoms when they have sex. Self-efficacy towards condom use was high, with 71.17% of learners reporting that they make their partners use condoms even if they do not want to. About fifty-five percent (55.4%) reported that they do not refuse sex without a condom. Most of the learners reported that they can disclose their HIV status if they are infected (62.9%), but they will stop having sexual intercourse, and some of them reported that they cannot tell anyone if they are infected and they can not stop having sex (41.11%). Half of the participants reported to be comfortable communicating with their partners about sex and use of condoms. 74.5% said that they ask sexual history of their partners and only 24% were found to be not comfortable with asking about their partners' sexual history. Most of the participants do not support the issue of having multiple sex partners as a good thing (Munguti, Grosskurth, Newell, Senkoro, Mosha, Todd, Mayaud, Gavyole, Quigley, & Hayes, 1997).

Table 2

DEMOGRAPHICS	HIV RISK LEVELS					Total number of learners
	No risk	1 risk	2 risks	3 risks	4 risks	
Age						
<18	7 (4.4%)	126 (79.7)	20 (12.6%)	5 (3.1%)	0(0%)	158 (51.4%)
18-20	3 (2.8%)	52 (49.0%)	33 (31.1%)	11(10.3%)	7 (6.6%)	106 (34.5%)
>20	5(11.6%)	12 (27.9%)	20 (46.5%)	5 (11.6%)	1 (2.3%)	43 (14.0%)
Gender						
Male	8 (4.8%)	95 (57.2%)	41 (24.6%)	15 (9.0%)	7 (4.2%)	166 (54.0%)
Female	7 (4.9%)	95 (66.9%)	33 (23.2%)	6(4.2%)	1 (0.7%)	142 (46.2%)
Education						
Grade 8	5 (7.9%)	47 (74.6%)	9 (14.2%)	3 (4.7%)	0 (0%)	64 (20.8%)
Grade 9	1 (1.5%)	48 (76.1%)	8 (12.6%)	3 (4.7%)	3 (4.7%)	63 (20.5%)
Grade 10	4 (6.2%)	35 (53.1%)	19 (29.6%)	6 (9.3%)	0 (0%)	64 (20.8%)
Grade 11	2 (3.0%)	34 (51.5%)	21 (31.8%)	5 (7.5%)	4 (6.0%)	66 (21.4%)
Grade 12	3 (5.8%)	26 (50.9%)	17 (33.3%)	4 (7.8%)	1 (1.9%)	51 (16.6%)
Marital status						
Single	14(4.9%)	181(63.9%)	65 (22.9%)	16 (5.6%)	7 (2.4%)	283 (92.1%)
Cohabiting	0 (0%)	3(42.8%)	1 (14.2%)	2 (28.5%)	1(14.2%)	7 (2.2%)
Sex partners						
0 partner	6 (4.1%)	123(84.8%)	15 (10.3%)	1 (0.6%)	0 (0%)	145 (47.2%)
1 partners	3 (3.8%)	44 (57.1%)	26 (3.3%)	4 (5.1%)	0 (0%)	77 (25.0%)
2-9 partners	5 (8.3%)	16 (26.6%)	25 (4.1%)	11(18.3%)	3 (5%)	60 (19.5%)

5.3 Main analyses: ARRM factors predicting sexual risk behaviour

The general hypothesis of the study was that components of the ARRM would predict sexual risk behaviour. The ARRM variables that were assessed included perceived susceptibility, HIV/AIDS knowledge, peer pressure, self-efficacy, sexual response efficacy, behaviour intentions, and intrinsic rewards. Sexual risk behaviours were measured with four variables, namely, the use of condoms for vaginal intercourse, the use of condoms for anal intercourse, the number of sexual partners the participant had in the last month, and the time taken by the participant before having sex with a new partner.

Binary logistic regression was used to investigate the hypothesis. Each of the sexual risk behaviours was used as the dependent variable, and all the ARRM variables were entered as a single block (i.e., simultaneously). For purposes of analysis, a higher score of the dependent variables indicates lack of risk for the particular risk behaviour. Similarly, higher scores for independent variables denote positive aspects. Only the intrinsic rewards variable was the exception. Gender was also included in the analysis as a control variable. Initial check on the data suggested that there were no numerical problems, since none of the independent variables had standard errors above 2.0. The results are presented below, with each of the risk behaviours being considered as a dependent variable.

a. The use of ARRM factors to predict the use of condoms during vaginal sexual intercourse

The first sexual risk behaviour considered is the use or non-use of condoms during vaginal sexual intercourse. For purposes of analysis the use of condoms was coded as “1” and non-use as “0”. The results of logistic regression in Table 3 below show that lower perceived susceptibility and sexual response efficacy were the best predictors of the use of condoms for vaginal sexual intercourse. The results show that for every one unit increase of perceived susceptibility ($P=.002$),

there will be a 1.20 (20%) chance of engaging in vaginal sex using a condom. Also, for a unit increase in sexual response efficacy ($P=.048$), we expect a 1.22 (22%) chance of engaging in vaginal sex using a condom.

The rest of the independent variables (HIV/AIDS knowledge, peer pressure, self-efficacy, sexual response efficacy, intrinsic reward, and behaviour intentions) were less likely related to the use of condoms for vaginal sexual intercourse.

Table 3: The use of condoms for vaginal intercourse

	B	SE B	WALD	P	OR ^a	95% CI ^b
Gender	-.247	.298	.686	.407	.781	.436—1.400
Perceived susceptibility	.183	.058	9.808	.002	1.201	1.071-1.347
HIV/AIDS knowledge	-.089	.172	.268	.605	.915	.653—1.281
Peer pressure	.101	.083	1.479	.224	1.107	.940—1.303
Self-efficacy	.057	.099	.333	.564	1.059	.873—1.284
Sexual response efficacy	.199	.101	3.893	.048	1.220	1.001-1.488
Intrinsic rewards	.069	.066	1.084	.298	.934	.821—1.062
Behaviour intentions	.235	.142	2.721	.099	1.265	.957—1.672

Note: n = 308; ^aOR = odds ratio; ^bCI = confidence interval

b. The use of ARRM factors to predict the use of condoms during anal sexual intercourse

The use or non-use of condoms during anal sexual intercourse was the next sexual risk behaviour considered. Only the independent variable of perceived susceptibility was related to the use of condoms during anal sexual intercourse (see Table 4). However, the relationship was negative. This means that for every one unit increase of perceived susceptibility ($P=.001$), there will be an almost 19% decrease of a chance of engaging in anal sex using a condom. There was no relationship between HIV/AIDS knowledge, self-efficacy, sexual response efficacy, intrinsic rewards, and the use of condoms for anal sexual intercourse. Behaviour intentions and peer pressure were less likely related to the use of condoms for anal sexual intercourse.

Table 4: The use of condoms for anal intercourse

	B	SE B	WALD	<i>P</i>	OR ^a	95% CI ^b
Gender	-.021	.346	.004	.951	.979	.497—1.928
Perceived susceptibility	-.215	.067	10.17	.001	.807	.707—.921
HIV/AIDS knowledge	.021	.195	7.011	.916	1.021	.696—1.497
Peer pressure	-.129	.097	1.779	.182	.879	.727—1.062
Self-efficacy	-.069	.113	.370	.543	.933	.747—1.166
Sexual response efficacy	-.115	.116	.978	.323	.891	.709—1.120
Intrinsic rewards	.048	.076	.408	.523	1.050	.905—1.218
Behaviour intentions	-.288	.161	3.207	.073	.750	.547—1.028

Note: n = 308; ^aOR = odds ratio; ^bCI = confidence interval

c. The use of ARRM factors to predict the number of sexual partners in the last 12 months

The number of sexual partners in the last month was the third sexual risk behaviour. Gender and perceived susceptibility were significantly related to the number of sexual partners learners had in the last month. Females were more likely to have not more than one sexual partner in the last month (OR = 2.52; 95% CI = 1.141—5.574). Each unit level increase in perceived susceptibility is equivalent to a 1.35 chance of the learners reporting no more than one sexual partner in the last month the *p* value for perceived susceptibility was .000. HIV/AIDS knowledge, peer pressure, self-efficacy, sexual response efficacy, intrinsic rewards, and behaviour intentions were less likely to be related to the number of sexual partners learners had in the last month.

Table 5: Number of sexual partners in the last 12 months

	B	SE B	WALD	P	OR ^a	95% CI ^b
Gender	.925	.405	5.225	.022	2.522	1.141-5.574
Perceived susceptibility	.301	.078	14.87	.000	1.351	1.159-1.574
HIV/AIDS knowledge	-.082	.221	5.137	.712	.921	.597—1.422
Peer pressure	.043	.105	.169	.681	1.044	.850—1.282
Self-efficacy	-.134	.133	1.009	.315	.875	.674—1.136
Sexual response efficacy	.160	.131	1.497	.221	1.174	.908—1.517
Intrinsic rewards	-.129	.081	2.570	.109	.879	.750—1.029
Behaviour intentions	.202	.183	1.223	.269	1.224	.855—1.753

Note: n = 308; ^aOR = odds ratio; ^bCI = confidence interval

d. The use of ARRM factors to predict the time taken before having sex with a new partner

The time taken before having sex with a new partner was the last sexual risk behaviour considered. Gender, perceived susceptibility and sexual response efficacy were significantly, positively related to the time taken before having sex with a new partner (see table 6). Females were almost three times more likely to delay sexual intercourse with a new partner (OR = 2.732; 95% CI = 1.613—4.627).

A one unit increase in sexual response efficacy increased the odds that learners will take longer (more than one month) before having sex with a new partner by about 19%. Gender and perceived susceptibility were significantly related to the time taken before having sex with a new partner (P=.002). HIV/AIDS knowledge and sexual response efficacy (P=.048) were less likely related to the time these learners take before having sex with a new partner, but intrinsic rewards, peer pressure, self-efficacy and behaviour intentions were not.

Table 6: Time taken before having sex with a new partner

	B	SE B	WALD	P	OR ^a	95% CI ^b
Gender	1.005	.269	13.981	.000	2.732	1.613—4.627
Perceived susceptibility	.165	.053	9.772	.002	1.179	1.063—1.308
HIV/AIDS knowledge	.118	.154	.592	.442	1.126	.833—1.522
Peer pressure	.073	.073	.997	.318	1.076	.932—1.241
Self-efficacy	-.046	.090	.261	.609	.955	.802—1.138
Sexual response efficacy	.177	.090	3.925	.048	1.194	1.002—1.423
Intrinsic rewards	-.089	.059	2.316	.128	.914	.815—1.026
Behaviour intentions	-.085	.139	.376	.540	.919	.700—1.205

Note: n = 308; ^aOR = odds ratio; ^bCI = confidence interval

Chapter 6: Discussion

6.1 Discussion of the preliminary findings

This study examined the usefulness of the ARRM in the prediction of HIV related risk behaviours among rural learners. In addition, their sexual practices were assessed. Most of the participants in this study did not perceive themselves as susceptible to HIV infection, and this was consistent with the literature (Eaton, Flisher & Aaro, 2003). Perceived susceptibility is the awareness that a person is engaging in risk behaviours and would be able to identify these behaviours (Lanier & Gates 1996). Individuals who perceive themselves to be at no risk for HIV/STDs actually do engage in risky sexual practices.

Previous research suggests that many individuals who perceive themselves to be at no risk of HIV have recently engaged in risky sexual behaviours (Cole, Logan & Shannon, 2008). Amongst 308 learners, only 73 learners were not at risk. The others were at risk for HIV infections. At the age of less than 13 years, these learners already had sexual partners and already engaged themselves in sexual risk behaviours. Amongst all these learners 77 had only one sexual partner and 75 of them are at risk for contracting HIV. Most of these learners had more than one sexual partner, which places them at risk of contracting HIV, with two hundred and thirty-five of them at either risk one, two, three, or four. There are also more chances for these learners to engage in HIV risk behaviours given that most of them think that they are not at HIV risk, despite their engaging in risky sexual behaviors.

6.2 Discussion of the ARRM factors predicting sexual risk behaviour

This study hypothesized that the ARRM would predict HIV-related risk behaviours in a South African rural population of learners. Many studies in the US found that the ARRM provides a more comprehensive understanding of the process of behaviour change (Flowers, Sheeran, Smith & Beail, 1997). This study serves to expand upon the previous studies, examining sexual risk behaviours by testing the ARRM among South African rural learners. The findings from the previous studies suggested that the ARRM model is applicable to most social groups, and are important for interventions that enhance communication skills, and teach methods of the use of condoms and HIV prevention.

This study was not consistent with previous research, in that it found that not all of the ARRM variables used with the present group of learners were useful in predicting sexual risk behaviours. Perceived susceptibility was the only variable that predicted all sexual risk behaviours. Sexual response efficacy predicted two sexual risk behaviours, which are, the use of condoms for vaginal intercourse and the time taken before having sex with a new partner. The sexual risk behaviours and the ARRM-variables that predicted sexual risk behaviours are fully discussed below.

a. The use of ARRM factors to predict the use of condoms during vaginal intercourse

Perceived susceptibility and sexual response efficacy were the only variables that predicted the use of condoms during vaginal intercourse. The other variables (HIV/AIDS knowledge, peer pressure, self-efficacy, intrinsic reward, and behaviour intentions) were less likely related to the use of condoms for vaginal intercourse. This means that these variables do not have the influence in the use of condoms during vaginal intercourse. Perceived susceptibility was also found to be

associated with the number of sexual risk behaviours, and it was supported for the role it plays in understanding the perception of different people, whether they are at high risk or not (Catania, Coates & Kegeles, 1990).

b. The use of ARRM factors to predict the use of condoms during anal intercourse

For the use of condoms for anal intercourse, only perceived susceptibility was the predictor for this sexual risk, but the relationship between these variables was negative. This means that perceived susceptibility did not have an influence in the use of condoms during anal intercourse. The other variables were not related to the use of condoms for anal intercourse, and behaviour intentions and peer pressure were less likely related. None of the ARRM variables has influence in the use of condoms during anal intercourse.

c. The use of ARRM factors to predict the number of sexual partners in the last 12 months

In the number of sexual partners in the last 12 months, perceived susceptibility was the only variable that has the influence in the number of sexual partners a learner had in the last 12 months. The rest of the variables HIV/AIDS knowledge, peer pressure, self-efficacy, sexual response efficacy, intrinsic rewards, and behaviour intentions did not have influence in the number of sexual partners these learners have in the last month. The ARRM was associated with the number of sexual partners in the last month, but its relationship was not strong.

d. The use of ARRM factors to predict the time taken before having sex with a new partner

Perceived susceptibility and sexual response efficacy were also associated with the time these learners take before they have sexual intercourse with a new partner. These two variables were the best predictors for this sexual risk behaviour, they were the only variables that have much influence in the time learners take before they have sexual intercourse with a new partner. HIV/AIDS, intrinsic rewards, and peer pressure did not have much influence in time taken before having sex with a new partner. Some of the variables (self-efficacy and behaviour intentions) were not related to the time taken before having sex with a new partner; this means that they do not play any role in influencing learners to engage in this kind of sexual risk behaviour.

The major finding of this study is that not all the predictor variables used with the present group of learners were useful in predicting the sexual risk behaviours. Perceived susceptibility was the only variable that predicted sexual risk behaviours measured in the present study. Perceived susceptibility plays a greater role in predicting risk behaviours, confirming previous findings (Eaton, Flisher & Aaro, 2003). Another study also found that perceived susceptibility has a significant relationship with sexual risk behaviours and it was also found that perceived susceptibility has a central position in all psychological models of health behaviour (Catania, Coates & Kegeles, 1990).

In this study perceived susceptibility was also found to be an important predictor for all sexual risk behaviours. In the study of empirical assessment of the AIDS Risk Reduction Model, Lanear and Gates also found that perceived susceptibility was significantly associated with every independent variable (Lanier & Gates, 1996). This confirm that not all the ARRM variables are the best predictors of sexual risk behaviours and its prediction depends on the population group studied for the particular study. The study population may demonstrate different

behavioural intentions when compared to the other populations and this can contribute to the prediction of the ARRM model.

The population group for this study was learners only. In South Africa ARRM can also be extended to include older people in order to make a better prediction. The number of ARRM variables has also emerged as significantly predictive of HIV-risk behaviours (Cochran & Mays, 1993). However, in the current study only two variables predicted sexual risk behaviours. Malow, Machon, Peipman, & Jennings, found that none of the ARRM variables was the predictors for condom use in their study (Malow, Machon, Peipman, & Jennings, 2002). It is possible that the role of the ARRM as the predictor of sexual risk behaviours depends on the kind of participants studied. Further studies using different kind of participants are suggested. Some of the ARRM variables may be predictive for some populations and in some contexts than others (Fisher & Fisher, 2000).

The ARRM has several variables, and it can be concluded that the variables used in the present study may not be suitable for the participants in the study. This can play a role on the prediction of ARRM and can also be the reason why no relationship was found between most of the ARRM variables and the sexual risk behaviours measured in this study (Fisher & Fisher, 2000). Variables identified as important in this study were: perceived susceptibility, sexual response efficacy HIV/AIDS knowledge, peer pressure, self-efficacy, intrinsic reward, and behaviour intentions. Therefore, further research is needed to examine the full range of the ARRM variables. One study assessed ARRM with HIV-positive women in the USA and found that 6 variables representing the four important constructs of the model were associated with consistent condom use (UNAIDS, 2006).

The present study also found that not all the ARRM variables predicted sexual risk behaviours. Two of the ARRM variables were the best predictors of the sexual risk behaviours measured in this study. It can therefore be said safely that

not all the ARRM variables that are important for the prediction of the sexual risk behaviours and there are certain sexual risk behaviours that can be predicted by the ARRM. Conner, Stein and Longshore (2005) found that peer pressure and self-efficacy predicts condom use, and in this study perceived susceptibility and sexual response efficacy also predicted condom use, but perceived susceptibility predicted all sexual risk behaviours assessed in this study. So it can be concluded that the prediction of the ARRM also depends on the kind of people studied for the particular study and the way people change their behaviour.

The ARRM measured here was only in terms of sexual behaviours, I would like to suggest that the ARRM can also be relevant to other HIV risk behaviours (i.e. needle sharing). ARRM variables as predictor of HIV risk behaviours has repeatedly emerged in previous cross sectional studies of HIV risk behaviours in US (Stanton, Li, Fang, Lin, Mao, Wang, Cottrell & Harris, 2004). These findings were inconsistent with the results found in this study. The reason for this discrepancy can be attributed to social and cultural differences. In South Africa it is found that not all the ARRM can be regarded as the best predictor of sexual risk behaviours. It is also possible that fewer ARRM elements may contribute to HIV preventions than it appears (Fisher & Fisher, 2000). While the ARRM has some strength in predicting HIV risk behaviours, it has weakness as well (Fisher & Fisher, 2000).

In the present study, only sexual risk behaviours were studied, and most of the previous studies that found the ARRM as the best predictor measured all HIV risk behaviours including needle sharing (Malow, Machon, Peipman & Jennings, 2002). It seems that this model can also be of relevance in South Africa if all the variables are considered, studying different populations and also all the HIV risk behaviours including sexual risks. In the population that was used for the present study, the ARRM did not predict sexual risk behaviours and its relationship with sexual risk behaviours was weak. It is therefore necessary to examine the impact of the ARRM with various individuals, since models such as the ARRM may give

us quite different things depending on which social group is being investigated.
Further studies with different population groups are being suggested.

Chapter 7: Conclusion

7.1 Conclusion

The ARRM provides insights concerning HIV preventive behaviour and it has been used in many populations (Fisher & Fisher, 2000). This study tested the ARRM to see if it can predict sexual risk behaviours. The ARRM views HIV prevention as a process of change through three stages, namely: labeling stage, commitment stage and enactment stage. The study found that not all of the ARRM variables can predict sexual risk behaviours. It can therefore be concluded that the ARRM variables may be more predictive for some population and not in others.

This study also assessed sexual practices of learners, and concludes that learners in rural areas are at risks of contracting HIV. Their behaviour places them at a higher risk of contracting HIV, so prevention programmes have to target rural areas. There are also more chances of these learners to engage in HIV risk behaviors because some of them still think that they are not at HIV risk while they engage in sexual risk behaviors. If these areas are not targeted there will be an increase in HIV cases in Limpopo. These learners despite their errant behaviour think that they are not at risk of contracting HIV. While prevalence of HIV infection in Africa is generally lower in rural than in urban areas, the situation in rural areas is worsening. The epidemic is at earlier stages of development in rural areas than in the towns, and preventive interventions are urgently needed (Munguti, et al., 1997). From this data, a conclusion can be drawn that young people are at high risk of contracting HIV infections and other STDs. Changing high risk behaviours is the only means of preventing the transmission of HIV. Development of appropriate prevention programmes is also a significant challenge to social; and public health scientist. There is an argent need for effective preventive activities at rural areas, especially through school-based interventions (Munguti, Grosskurth, Newell, Senkoro, Mosha, Todd, et al., 1997).

7.2 Limitations

Not all of the ARRM variables were used in the present study. This may have influenced the outcomes of the study. Although the variables used in this study were selected from the ARRM, this study did not consider all the factors related to sexual risk behaviours. This study was conducted among youngsters, in the presence of their peers. Thus, it cannot be reported with certainty that there were no psychological distractions and socially desirable responding. Responding to questions may have been influenced by the presence of peers. However, to minimize the response bias, the participants were instructed to only look at their own questions. The sample used included learners from a rural community in South Africa. Therefore it is likely that HIV and sexually related issues might have been too sensitive for them. Some of the learners may not have revealed accurate or true information about their sexual behaviours.

It is also possible that there may have been other factors contributing to the learners' risk behaviour than those examined in this study. Also, another limitation of this study is that outcomes were measured with participants' self reports, which may have been inaccurate, although strategies were used such as emphasizing confidentiality intended to increase participants' ability to recall and to motivate them to be honest when responding to the questions.

7.3 Recommendations

Since this was the first study testing the ARRM in a South African rural community, further studies are recommended to test this model in other South African rural contexts. Furthermore, not all of the ARRM variables were used in this study; I recommend that future studies examine the full range of the ARRM constructs in South Africa. However, it is important that future studies of HIV risk behaviours focus on models that extend beyond the intrapersonal cognitive behavioural factors such as the ARRM, and include interpersonal mechanisms that influence risk and risk reduction (Li, Stanton, Fang, Lin, Mao, Wang, et al., 2004).

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Appendices:

APPENDIX 1

Demographic Variables

1. How old are you? _____ Years.

2. What is your gender?

Male	Female
------	--------

3. What is your marital status?

Never married	Married	Cohabiting
---------------	---------	------------

4. Religious affiliation

Christian	Muslim	other
-----------	--------	-------

5. Which grade are you

6. How many sexual partners do you have _____

APPENDIX 2

UNIVERSITY OF LIMPOPO ETHICS COMMITTEE

PROJECT TITLE: HIV RELATED RISK BEHAVIORS IN A SOUTH AFRICAN RURAL COMMUNITY

PROJECT LEADER: Rathani Nemuramba

CONSENT FORM

I, _____ hereby voluntarily consent to participate in the following project: HIV RELATED RISK BEHAVIORS IN A SOUTH AFRICAN RURAL COMMUNITY

I realize that:

1. The study deals with HIV related risk behaviors
2. The procedure or treatment envisaged may hold some risk for me that cannot be foreseen at this stage.
3. The Ethics Committee has approved that individuals may be approached to participate in the study.
4. The experimental protocol, i.e. the extent, aims and methods of research to participate in the study;
5. The protocol sets out the risks an explanation of the anticipated advantages for

myself or others that are reasonably expected from the research;

6. I will be informed of any new information that may become available during the research that may influence my willingness to continue my participation;
7. Access to the records that pertain to my participation in the study will be restricted to persons directly involved in the research;
8. Any questions that I may have regarding the research, or related matter, will be answered by the researchers;
9. If I have any questions about, or problems regarding the study, or experience any undesirable effects, I may contact a member of the research team;
10. Participation in this research is voluntary and I can withdraw my participation at any stage;
11. I indemnify the University of Limpopo and all persons involved with the above project from any liability that may arise from my participation in the above project or that may be related to it, for whatever reasons, including negligence on the part of the mentioned persons.

SIGNATURE OF THE RESEARCHED PERSON

SIGNATURE OF WITNESS

SIGNATURE OF PERSON THAT INFORMED
THE RESEARCHED PERSON

Signed at _____ this _____ day of _____ 2010