

The Impact of Laduma, a health education intervention, on the knowledge, attitudes, beliefs and practices regarding sexually transmitted infections among secondary school learners in KwaZulu-Natal

Shamagonam James

Submitted in fulfilment of the requirements for the degree of Master of Medical Science (M. MED. Sc) in the Department of Family Medicine, Nelson Mandela School of Medicine, Durban. 2005

Table of Contents

Declaration	
Acknowledgments	1
Abstract	
Chapter 1: Introduction	
1.1 Rationale	4
1.2 Sexually Transmitted Infections / HIV / AIDS	5
1.3 Role of Health Promotion in Sexuality Education	6
1.4 Print Media	9
1.5 Development of Laduma	13
1.6 Purpose of the Study	16
1.6.1 Objectives	16
Chapter 2: Background and Literature Review	
2.1 Adolescent Sexuality Education in South Africa	17
2.2 Adolescent Sexual Behaviour	18
2.2.1 The Health Belief Model	21
2.2.2 Social Learning Theory	24
2.2.3 Theory of Reasoned Action	26
2.2.4 Application of Theories	27
2.3 Evaluation	27
2.3.1 Evaluation of Print Media	28
Chapter 3: Methodology	
3.1 Study Design	32
3.1.1 Study Setting	33
3.1.2 Study Sample	33
3.1.3 Sampling, Allocation and Phases of Study	34
3.2 Study Intervention: A single reading of Laduma	35
3.3 Study Instrument, Data variables and Outcome Measures	36
3.4 Data Analysis	42
3.5 Consent/Ethical Approval	43
3.6 Feedback to Stakeholders	43
Chapter 4: Results	
4.1 Randomisation and allocation of schools and learners to the study	44
4.2 Analysis of loss to follow up	45
4.3 Learners' responses regarding their knowledge, attitudes, beliefs and perceptions, sexual behaviour and impressions of Laduma at baseline	46
4.3.1 Demographic Profile of all learners	46
4.3.2 Knowledge	47
4.3.3 Attitudes	52
4.3.4 Learners' beliefs and perceptions about sexually transmitted infections	53

4.3.5	Sexual practices and condom use	54
4.3.6	Learners' impressions of Laduma	55
4.4	Response of learners in the intervention group after a single reading of Laduma compared to the control group at T1, T2 and T3	56
4.4.1	Impact of Laduma on Knowledge	57
4.4.2	Impact of Laduma on Attitudes	59
4.4.3	Impact of Laduma on sexual behaviour, condom use and intended behaviour	61
4.5	Summary of Results	64

Chapter 5: Discussion

5.1	Main findings and impact of the intervention (Laduma)	66
5.1.1	Knowledge	66
5.1.2	Attitude	69
5.1.3	Learners' beliefs and perceptions about sexually transmitted infection	70
5.1.4	Sexual behaviour, condom use and intended behaviour	71
5.1.5	Learners' Impressions of Laduma	73
5.2	Evaluation	73
5.3	Value and limitations of Print Media	75

Chapter 6: Recommendations and Conclusion

6.1	Recommendations	79
6.1.1	Learners	79
6.1.2	Teachers	80
6.2	Conclusion	81

Bibliography	83
---------------------	-----------

List of Tables

Table 1	Health Promotion Matrix as applied to the prevention of STIs / HIV	8
Table 2	Health Belief Model Adapted for South African Adolescents	23
Table 3	Social Learning Theory Adapted for South African Adolescents	25
Table 4	Socio-Demographic Profile of Secondary School Learners	46
Table 5	Learners Knowledge about the Cause, Spread, Treatment of, and the protection from, Sexually Transmitted Infections Percentages	48

Table 6	Secondary School Learners' Sources of Information	50
Table 7a	Secondary School Learners' Communication with Parents	51
Table 7b	Secondary School Learners' Communication with Friends	51
Table 7c	Secondary School Learners' Communication with Partner	51
Table 8	Secondary School Learners' Attitude to Condom Use	52

List of Figures

Figure 1	Sampling of Schools and Randomisation Framework	44
Figure 2	Perception of STI Problem among Secondary School Learners	54
Figure 3a	Female secondary school learners' knowledge about the cause of sexually transmitted infections over three time periods by group	58
Figure 3b	Secondary school learners' knowledge about the spread of sexually transmitted infections over three time periods by group	59
Figure 3c	Secondary school learners' attitude to condoms over three time periods	60
Figure 3d	Male secondary school learners' attitude toward PWA	61

Declaration

The whole thesis is my own work and has not been submitted in part or in whole to any other University.

The research was done in the Midlands district of the Pietermaritzburg region of KwaZulu-Natal.

Supervisors

Professor CC Jinabhai; Department of Family Medicine, Nelson Mandela School of Medicine, Durban

Professor SP Reddy; Health Promotion Research and Development Group, Medical Research Council, Cape Town

Acknowledgements

A special thank you to Nilen Kambaran, Dr Rob Ruiter and Professor Bart van den Borne for their statistical support. Thank you also to Dr Ruiter and Professor van den Borne for the review of earlier drafts of this thesis.

Thank you to Professor Jinabhai, Professor Reddy and Dr Myra Taylor for their teaching, guidance and support throughout the project as well as the reviewing of the numerous drafts of this thesis.

To the Department of Education, principals, educators, parents and learners of the schools included in the study, thank you for working so co-operatively with us. To Eshania Thumbadoo thank you for your excellent assistance in managing and collecting the data.

To my family, Sherwin, Kiran and Nikhil thank you for the time you “gave” to me, to complete this thesis.

ABSTRACT

Purpose

To evaluate the impact of Laduma, a health education intervention, on the knowledge, attitudes, beliefs and practices regarding sexually transmitted infections among secondary school learners in KwaZulu-Natal.

Objectives

The objectives of the study were to determine knowledge, attitudes, beliefs, perceptions and practices of secondary school learners regarding sexually transmitted infections at baseline and post-exposure to Laduma; assess intended behaviour change regarding sexually transmitted infections and condom use as well as the awareness of skills to achieve such behaviour; assess learners' perceived vulnerability to sexually transmitted infections; assess comprehension, acceptability and appeal of the photo-novella among learners and to assess whether learners can identify with the characters and situations in the photo-novella.

Design

This was an experimental study design.

Setting

Nineteen randomly selected secondary schools in the Midlands district of KwaZulu – Natal.

Subjects

Grade 11 learners, $n = 1168$, from randomly selected schools that were further randomised into intervention and control groups.

Outcome Measures

The learners had to complete three sets of questionnaires that elicited information about their biographical profile, knowledge, attitudes, beliefs, perceptions and practices regarding sexually transmitted infections, intention to change their behaviour with regard to sexually transmitted infections and condom use, as well as their skills to achieve such behaviour, their perceived vulnerability to sexually transmitted infections and their perceptions of Laduma. All of these outcomes were assessed at baseline (T1), following the learners' exposure to Laduma (T2, three weeks after the baseline), as well as six weeks later (T3) in the case of the intervention group. With respect to the control group they had to answer the baseline questionnaire on all three occasions.

Results

The mean age of the respondents was 16.8 years with almost two thirds of the learners being between the ages of 15 – 18 years. Seventy percent were primarily Zulu speaking. Learners reported feeling personally scared of getting a sexually transmitted infection with 17.8% responding that they thought they could get a sexually transmitted infection in the next two years. There was a significant gender difference between male and female learners in their topics of communication to friends, parents and partners regarding HIV/AIDS, condom use, having sex or not having sex ($p < 0.01$). Although learners had adequate knowledge about the spread of sexually transmitted infections at baseline, the mean scores for the spread for the group exposed to Laduma differed significantly from the mean scores of the control group, both immediately after the intervention ($p < 0.01$) and six weeks thereafter ($p < 0.001$). Learners in the intervention group responded more positively towards condom use at time 2 (T2) than the control group and maintained this change six weeks later. Sexual activity and condom use at time

3 (T3) was not influenced by the intervention but was significantly predicted by past sexual activity ($p < 0.001$) and past condom use ($p < 0.001$) respectively.

At time 3 (T3) significantly more learners in the intervention group intended to have sex with a condom (65.1%) compared to the control group (52.3%, $p < 0.05$). Overall learners had a positive response to Laduma and appreciated it as a health education intervention.

Conclusion and Recommendation

The findings of this study provided important information about adolescent sexuality on a range of outcomes related to knowledge, attitudes and sexual behaviour. The findings also provided information on learners' gender differences about what they communicate and to whom, as well as their sexual behaviour.

After a single reading of Laduma learners showed an increase in knowledge about the spread of sexually transmitted infections, a change in their attitude to condom use as well as an increased intention to practise safer sex. Laduma did not influence communication about sexually transmitted infections, sexual behaviour nor condom use. These are complex behaviours and indicate that interventions focussing on preventive sexual behaviour need to move beyond awareness and information dissemination towards being more intensive and skills focussed. Such interventions need to address the gaps between knowledge and practice and be facilitated in a context that supports such implementation.

The specific recommendations made from the findings of this study therefore include, the development of a systematic health promotion programme that addresses the issues related to personal vulnerability, knowledge related to treatment of and protection against sexually transmitted infections as well as skills that promote safer sexual choice.

CHAPTER 1

Chapter 1: Introduction

Rationale
Sexually transmitted infections / HIV / AIDS
Role of health promotion in sexuality education
Print media
Development of Laduma
Purpose of the Study
Objectives

1.1 Rationale

Sexually transmitted infections (STIs) pose a serious public health problem for South Africa with about eleven million episodes being treated annually (Department of Health, 2000). The last decade has seen an increase in the consequences of unsafe sexual behaviours (UNAIDS Report, 2000). In South Africa the National HIV sero-prevalence study focusing on women attending antenatal clinics at public health facilities indicated a prevalence rate of 22.4 % (Department of Health, 2000). The age group most affected was women in their twenties; HIV prevalence for 20 – 24 year old women was 25.6 % and for 25 – 29 years of age was 26.4 %. HIV prevalence rate for women under 20 years of age was 16.5 % (Department of Health, 2000).

KwaZulu – Natal has 20.7% of the population of South Africa, with 35.5% being under 15 years old (Education Foundation Atlas, 2000). The school – going population, that is adolescents between 7 and 18 years, make up 27% of the national population with 2 342 760 attending schools in KwaZulu-Natal. This figure is the highest of all the provinces.

It is during these formative years that patterns of behaviour are developed that either protect or place adolescents at risk later in adult life (Wren et al, 1997). Developing protective sexual behaviour is dependent on the development, implementation and

adoption of effective primary prevention programs that address behaviours in order to curb the increase of sexually transmitted infections including HIV / AIDS (Agha, 2002; MacPhail & Campbell, 1999). To date, several prevention programs about safer sexual behaviour have been implemented (Harrison et al, 2000), but their level of success is uncertain, as they have not been effectively evaluated. Those programs that have been evaluated failed to meet all of the criteria needed to be defined as soundly designed studies (Oakley et al, 1995). Such studies must satisfy the four core criteria, namely a control group, pre- and post intervention data and reporting on all targeted outcomes. These criteria were taken into account in designing this study, which aimed to assess the impact of a systematically developed educational print medium, Laduma, which focussed on increasing knowledge, improving attitudes and instilling behaviours that promote and contribute to safer sexual practices, and was based on the tenets of a randomised trial. Randomised controlled trials provide the most internally valid test of the efficacy of interventions (Jemmott & Jemmott, 2000).



1.2 Sexually Transmitted Infections / HIV / AIDS

The emergence of HIV/AIDS has called for a reassessment of sexually transmitted infections as a co-factor in the transmission of HIV (Colvin, 2000). Since sexually transmitted infections play a role in the transmission of HIV and HIV alters the pattern of sexually transmitted infections (UNAIDS, 2000, Williams et al, 2000), their concurrent existence renders an infected individual more infective to his/her sexual partners (Colvin, 2000). Sexually transmitted infections and HIV share not just a biological link but a behavioural link as well; both infections are transmitted through unprotected sexual activity (UNAIDS, 2000). This combined behavioural and biological link adds a dimension of complexity to sexually transmitted infections, the management of which

until now has been defined by medical treatment protocols, with poor understanding of the behavioural aspect.

The lack of a medical cure for AIDS has placed behavioural prevention high on the agenda to curb the transmission of sexually transmitted infections (Pequegnat & Stover, 2000). Behavioural prevention goes beyond the realm of knowledge acquisition and awareness, but includes those strategies that promote attitude and overt behaviour change among people (Rogers, 2000). HIV / AIDS prevention according to Rogers, presents a motivational rather than informational challenge. He further states that this challenge can be met through interpersonal communication through mass media. An example of such communication is through entertainment-education, which is the intentional placement of educational content in an entertainment message. A local example of this is the intervention evaluated in this study, Laduma, a photo novella developed to both inform and entertain.

1.3 Role of Health Promotion in Sexuality Education

The approach to health and behavioural management has evolved over the years from applying a disease model to a health model (Bandura, 2000). The health model has as one of its components health promotion, which is fundamental to the delivery of health education in a comprehensive manner. Further, the first key document of the World Health Organisation of 1986, the Ottawa Charter drew attention to the mounting ecological challenges, and the Health for All movement forged through Agenda 21 following the Rio Conference in 1992 re-emphasised this (Kickbusch, 1995). The key tenet of health promotion is the shift from working solely within the health sector to include other sectors, making inter-sectoral action more tangible through an organisational development

approach. This is evidenced in the spread of the settings-based health projects such as health promoting schools.

Application of the principles of health promotion involve systematically devising and implementing a programme that takes into account the medical and non-medical aspects that are required to effectively manage a health problem.

The health promotion matrix (Reddy et al, 1995, Table 1) is an example of a comprehensive approach to a health problem. Using STI / HIV as an example of a health problem that needs to be addressed requires instituting changes in education, facilities and regulation across the three levels of care, namely primary prevention, early detection and patient care. In the case of a targeted programme for the prevention of sexually transmitted infections for adolescents, education at a primary prevention level includes awareness campaigns, skills training and counselling. Facilities would be those structures that provide condoms at reduced cost or free, as well as the financing of research for intervention development and the evaluation of the effectiveness of programmes (Kok, 1992). The regulations required include, for example, the implementation of the school HIV / AIDS programme as set by the National Department of Education (Government Gazette, August 1999). For HIV positive people, preventive therapy for co-infections such as tuberculosis may be given at the early detection level. For AIDS diagnosed patients supportive care may be rendered at the patient care level. It is clear from this example that addressing a health problem is more than just studying the behaviour of individuals but includes how societies organise access to health for social groups (Kickbusch, 1995).

This re-focus from individual to collective and political action recognises that health education was too narrow a concept. Together with this shift was an acknowledgment that health promotion not only addresses the negative aspects of health by focussing on the reduction of risks of health problems occurring but also to promote

positive individual health status (Cork, 1990). To achieve this the three aims outlined in the Ottawa Charter of 1986 need to be adhered to, namely to advocate for health, enable people to achieve their fullest health potential and to mediate amongst different interest groups to coordinate health action.

Laduma was therefore developed and used as a tool to create awareness about an important topical health issue, promote ways in which adolescents could adhere to safe sexual health practices, demonstrate effective communication between partners and educate about access and expectations regarding health facilities and care. Individual use of Laduma ensures that adolescents are made aware of action to be taken to maintain and protect themselves against sexually transmitted infections. Facilitated use by, for example, a teacher could raise awareness about collaboration with health facilities and local health educators, as well as ensure that communication skills are taught to enable adolescents to decide to abstain or use condoms.

Table 1: Health Promotion Matrix as applied to the prevention of STIs / HIV

HEALTH PROMOTION DIMENSION	PRIMARY PREVENTION	EARLY DETECTION	PATIENT CARE
Health Education	Awareness Campaigns	Recognition of symptoms eg TB/STIs	Care and support
Facilities/Provisions	Free Condoms	Treatment at clinics	Medical and psychological services
Regulation / Legislation	STI / HIV prevention at schools	Notification of TB/STIs	Laws prohibiting discrimination against people with AIDS

1.4 Print Media

Print media is a form of mass media and is one of the channels of mass communication. It is different from personal communication (between individuals that know each other) and other forms of mass communication which includes broadcasting (television and radio) and displays (billboards, posters etc.) (Romer & Hornik, 1992).

The use of mass media has changed health education (aimed at merely preventing disease) into health promotion (a behavioural approach to health education), by subscribing to the principles of health promotion like informing the public, motivating at an individual level and advocating social and political changes to create healthy environments (Schugurensky, 2005). Health related education through, for example, mass media has an educational aim which may be to change behaviour or maintain healthy behaviour. The use of mass media is a potentially powerful tool to promote health messages to large numbers of people in a short space of time. In employing media as a strategy to deliver health messages certain guidelines need to be considered, for example, an analysis of the problem (setting of objectives and targeting the audience), selection of appropriate media and developing an effective message and evaluation design (Egger et al, 1993). This systematic development of media is re-enforced in Hubley (1995) in his description of the communication process as involved in media development. The communication planning process in summary includes those elements that delineate the aims of the communication (health education), the target group and how they can be reached to achieve the specified or desired behavior that is the choice of source (print media), messages (relevant and appropriate) and channels (mass media). Further an understanding of the characteristics of the target group is required to influence the decisions made about the communication processes chosen and these need to be verified

through pre-testing and evaluated once used to allow for further improvement to the communication process for future use.

Print media as a specific example of mass media serves as a channel of education and is a mean of delivering health messages to susceptible groups of people, with the aim of influencing health behaviours and reducing risk behaviour, by effecting voluntary behaviour change. Print media, widely used in Latin America and some European countries, was popular because it provided a less abstract portrayal of a community problem, especially where literacy levels were low (Comings, Frantz & Cain, 1981). When developed in conjunction with relevant stakeholders, including the target group, print media has been found to be more effective because the emphasis is no longer solely on knowledge acquisition but on experiential education that is learner directed (Roter et al, 1981). This is known as the participatory approach to media development and is grounded in the theories of health promotion and social learning (Kok et al, 1996). These theories have re-oriented health education from being a passive process of information provision to one that is more action based. It requires individuals to take cognisance of their situation, socially, economically and politically, as well as to think critically about their health choices.

A participatory approach to media development also ensures inculcation of beliefs and cultural norms that are relevant to the target group. This approach fosters respect and dignity, competence and interdependence amongst all who participate in the process of researching and developing print media about an aspect that affects their lives (Roter et al, 1981). Print media therefore needs to be developed taking into account the characteristics and factors influencing the problem, as well as the behaviour of the target group, for example, that of adolescents. Further when the educational content relates to personal beliefs and experience, motivation to learn increases. This can be achieved through open-

ended stories, socio-dramas or pictures depicting typical health-related situations. Print media developed in this way serves as a cue for adolescents to identify with and react to health-related problems and risk behaviour.

A specific form of print media called photo-comics, photonovels or photonovellas, is an educational tool that is based on comic strips but differ from it in that the stylised drawings are replaced by actual photographs. It proved to be a popular source of reading material amongst those that lacked effective reading skills in countries like Latin America and many cities in the United States. A description of the development of a photonovel for Chinese woman designed to promote proactive choices regarding breast cancer presented the advantages and disadvantages of such a medium as well as the development of it. The advantages were that a photonovel unlike brochures that can be discarded, radio spots that can be forgotten or posters that can be ignored can remain in the reader's hands as a reminder of its message. Some of the disadvantages pointed out is that the information is static and cannot be changed once printed without extra costs being incurred, close teamwork (which may pose a problem to some) is required amongst the writers, photographers, actors and printers, all of whom may not be familiar with working with other professionals for example health professionals (Oppenheim et al, 2004).

In designing the photonovel several issues that were taken into account are outlined providing the reader with guidelines for effective development of a photonovel. The two broad issues to explore are the message and the audience. The message and goal of the photonovel needs to be specific. One central theme needs to be explored so as to be clear to the reader what the message is, as opposed to attempting to incorporate several messages into one photonovel. The writing and presenting of the message needs to target a specific audience in terms of age, gender, educational level, visual literacy, preconceived ideas and prevailing local customs.

Oppenheim et al (2004), go on to explain that a photonovel is not just a story or a series of photographs tied together by a dialogue but instead is an intricate weaving of three components, the plot, dialogue, and visual content, with each component complementing and reinforcing the others. In the first component a distinction is made between a plot and a story, where the former (as in the case of photonovels) is a narrative of events with particular emphasis on cause and effects. This prompts the reader to ask questions and get to know the characters better while at the same time identifying with the characters, internalising the facts and relating to the situation. All of this is enhanced by adhering to some fundamental guidelines like writing a plot that is easily understood by the audience, keeping the cast to a minimum (three to five central characters) that carry the plot to a conclusion, clarifying for the reader the scene changes through the use of narrative inserts that say where the scene has changed to as well as pre-testing the subject matter to avoid an outraged audience especially if the subject matter is sensitive.

The second component is the dialogue which is inserted within the white balloons and the emphasis is placed on short easy to read vocabulary that holds the short attention span of the readers. The dialect is determined through pre-testing with a sample of the intended audience especially where colloquial language is used and may be relative to different audiences. The use of colloquial language helps readers to better identify with the characters as well as understand the intended meaning with less confusion.

The third component, the visual content, is what determines whether the photonovel will stimulate interest or not. It is more likely to do so if the photographs are perceived as familiar and take into account the concept of visual literacy and visual comprehension that is the photographs need to be positioned in a way that does not clutter the page, varies in position (close up, medium close up) and maintains the eye-flow of the reader by maintaining the direction of the movement of the characters through the pages.

In South Africa the use of photonovels or photocomics is a relatively novel idea. It has also been documented to be an ideal format for education of South African adolescents because of their low literacy rate and the widespread popularity of comics (Everett & Schaay, 1994). The evaluation of Roxy an AIDS prevention comic book, which identified a need for more information about sexually transmitted infections as well as negotiation and communication skills to enact the required health behavior (safer sexual practice), was instrumental in developing Laduma, (Toroyan & Reddy, 1997). The strength of print media lies in the fact that it is popular with adolescents (Wright & Sherman, 1999) and that a photocomic such as Laduma could easily be accessed from school and public libraries as well as clinic facilities. It can also be carried around and facilitated discussion can be pursued in a classroom situation by the teacher as part of face-face discussion. The advantage of this method is that it allows for clarification of any misunderstandings, discussion and feedback (Hubley, 1995).

1.5 Development of Laduma

Laduma, a photo-novella, is an example of print media using actual photographs as opposed to cartoons. It is one of the first photo-novellas developed in this way that aimed to address the issue of sexually transmitted infections. The work group applied their experience in developing “Roxy”, a photo-novella addressing the issue of HIV / AIDS, to two subsequent comics namely “Between us” and Laduma.

The development of Laduma was therefore based on the experience gained from developing Roxy and followed a specific process starting with the consultations and ending with the product. These consultations involved extensive collaboration between artists, researchers, a multidisciplinary team of health workers and the target group. Their task was to translate the appropriate health messages into an appealing story. A series of

workshops were designed to explore the views and experiences of adolescents in greater depth. The workshops included adolescents who were recruited through a volunteer system at the appropriate schools and aimed to foster trust and familiarity (Toroyan & Reddy, 1997). Through these workshops the team, made up of writers, researchers and other health workers, obtained a clearer picture of the issues affecting adolescents. Issues explored included their relationships with their parents and gender related sexuality. The workshops provided the core around which the story was developed and the realism in the comic was achieved through the participants' reflection of their lifestyles. The participants themselves also benefited from the sessions through feedback and debriefing sessions. A trained counsellor skilfully managed the complexity of this process.

The storyline was developed from a number of different themes that came up from the workshops, from which the group selected the main themes and characters. The characters were developed to reflect the differing points of view. The story was pre-tested for language and relevance to the setting for which it was intended. Once credibility was ensured a storyboard was drawn that was used for the photo shoot. Adolescents, who were involved in the focus groups and found to depict the characters well, were invited to participate in the photo shoot. The community provided the background "extras" and their homes were the settings for some of the shots.

Throughout the developmental process, the research team reviewed the objectives of Laduma. Laduma aimed to explore the decisions and dilemmas facing adolescents today with regard to their sexuality. It provides the reader with accurate factual information to increase his or her knowledge and reduces misconceptions about sexually transmitted infections, exposes them to real life situations, possible risks and solutions in a manner with which they can identify. It also aims to increase a positive attitude towards safer sexual practices and to enhance self-efficacy and the adoption of behavioural skills

needed to negotiate safer sex with partners. These included talking about sexually transmitted infections and prevention with a partner, and depicting skills related to negotiating safer sexual practices and decision-making.

1.6 Purpose of the Study

The purpose of this study was to test the hypotheses that a single reading of Laduma by secondary school learners can lead to a change in their knowledge, attitudes, beliefs and practices regarding the prevention and transmission of sexually transmitted infections.

1.6.1 Objectives

The objectives of the study were to:

- determine the knowledge, attitudes, beliefs, perceptions and practices of secondary school learners regarding sexually transmitted infections at baseline and post-exposure to Laduma
- assess intended behaviour change regarding sexually transmitted infections and condom use as well as the awareness of skills to achieve such behaviour
- assess learners' perceived vulnerability to sexually transmitted infections
- assess comprehension, acceptability and appeal of the photo-novella among learners
- assess whether learners can identify with the characters and situations in the photo-novella.

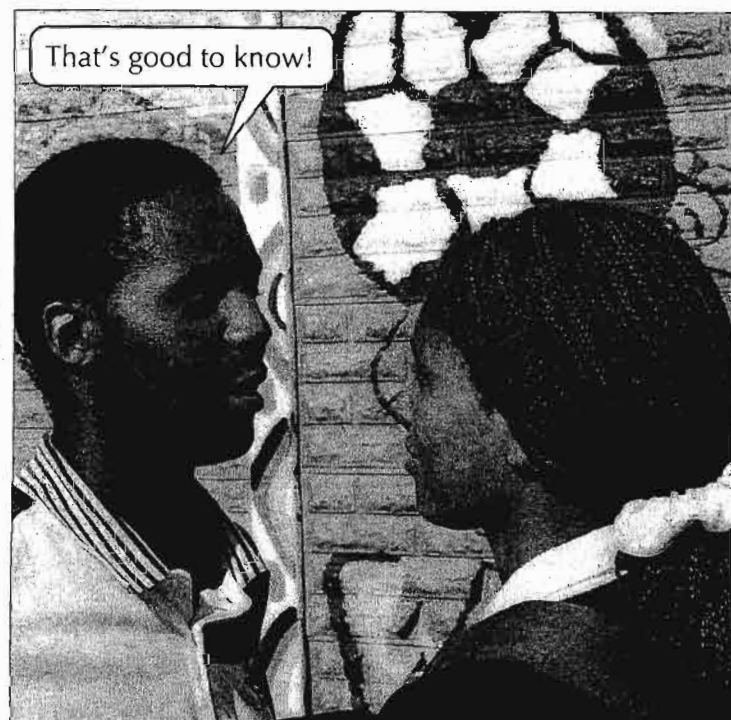
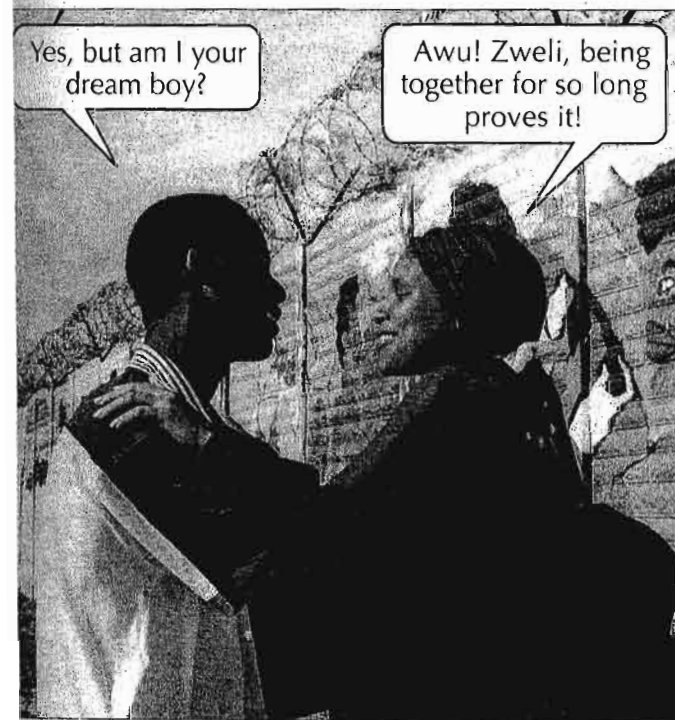
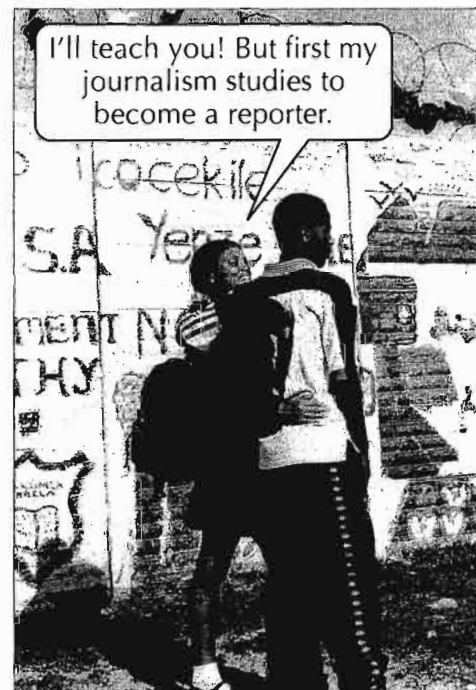
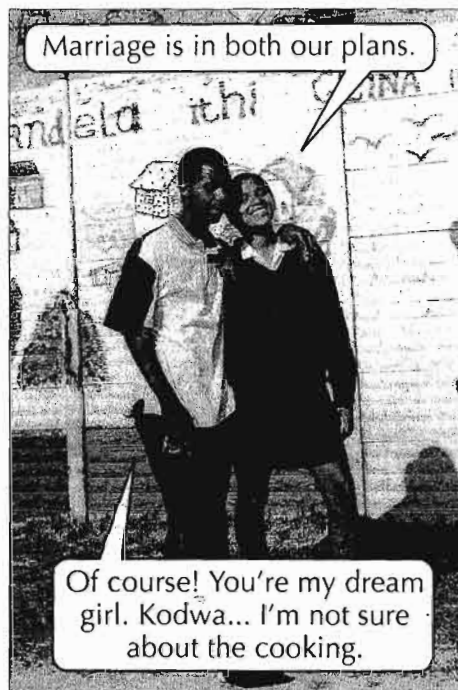
LADUMA

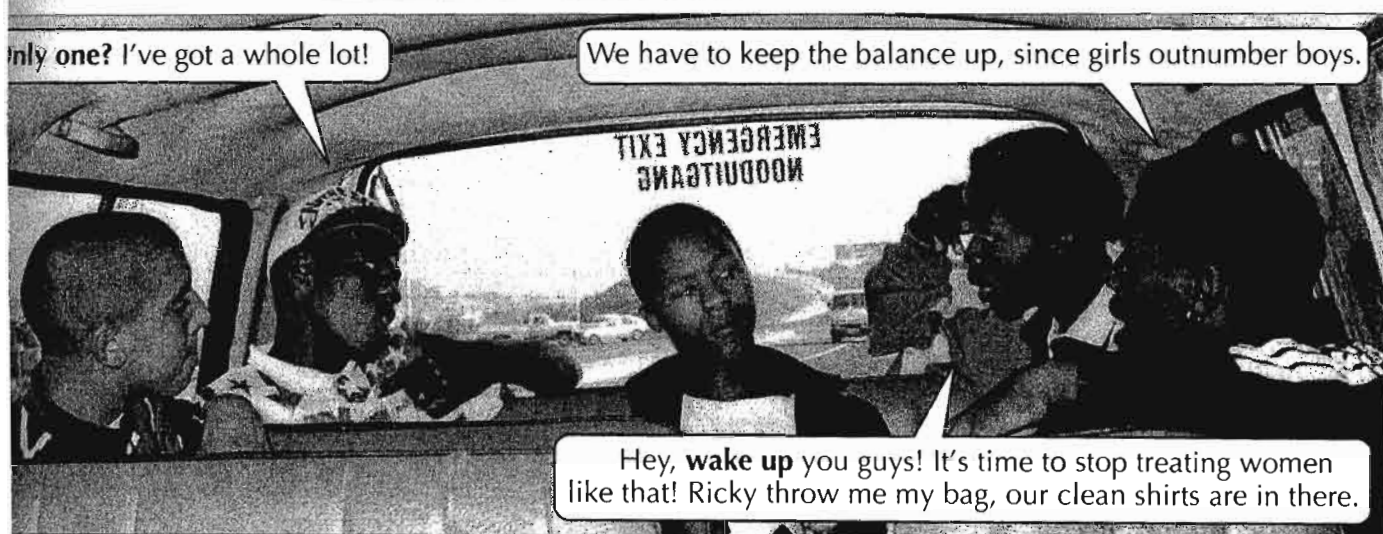
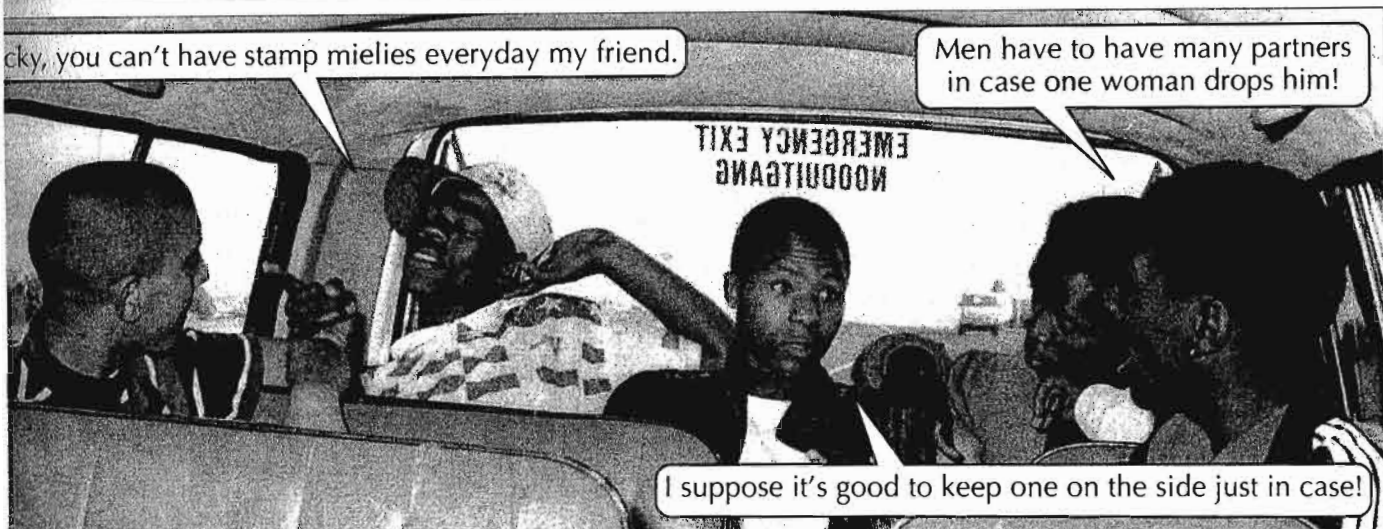
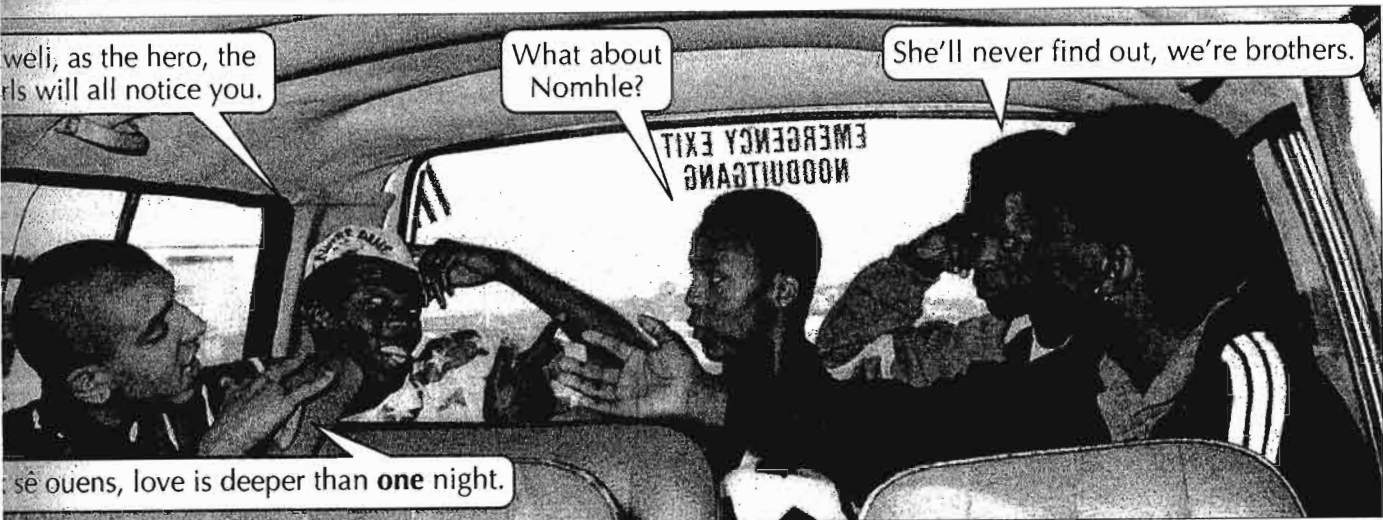
A story of love, sex and dreams



NACOSA SOUTH AFRICA
UNITED
AGAINST AIDS
WESTERN CAPE

BALISA
EDUCATIONAL COMICS





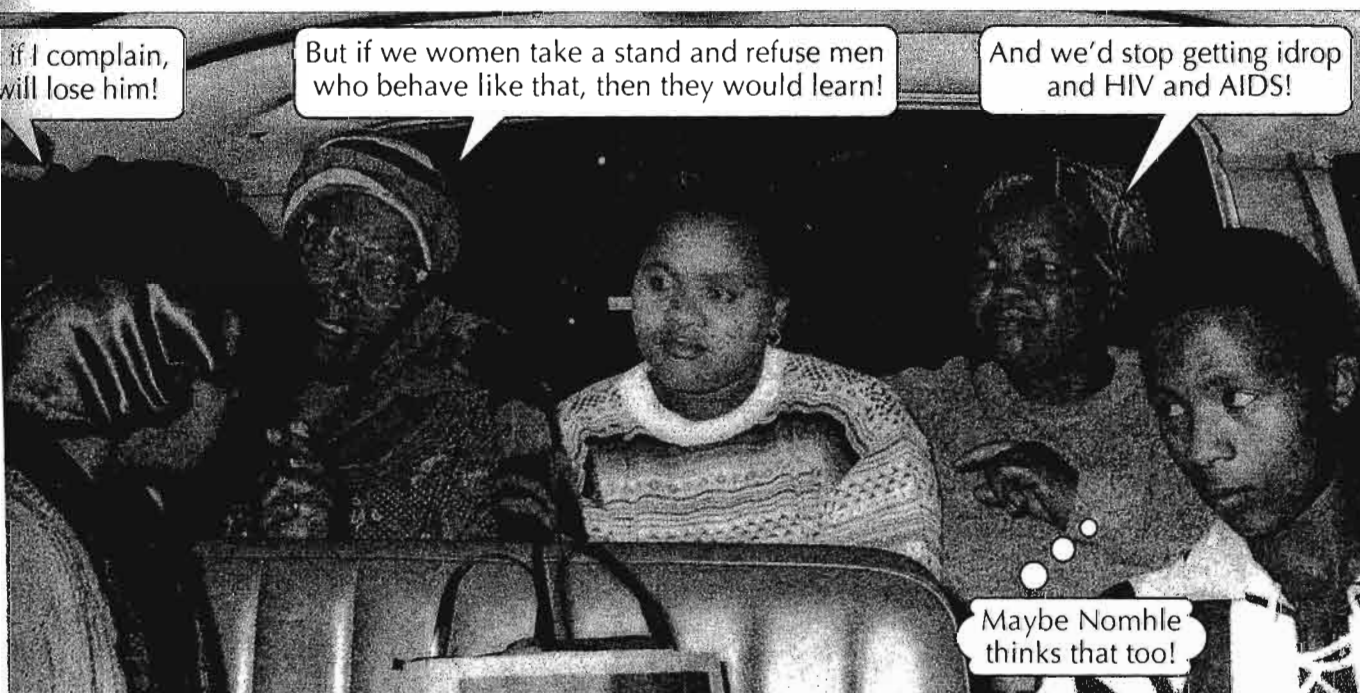


mama! I know he's sleeping around
cause how else would I have idrop.

They are **never** happy with one woman. They
want to be kings and have lots of women.

And if you tell them you've got idrop
they say it's **you** whose sleeping around!

Pam's sister had a baby! The Traditional
Healer mentioned a birth in the family!
Maybe I got it from Pam!

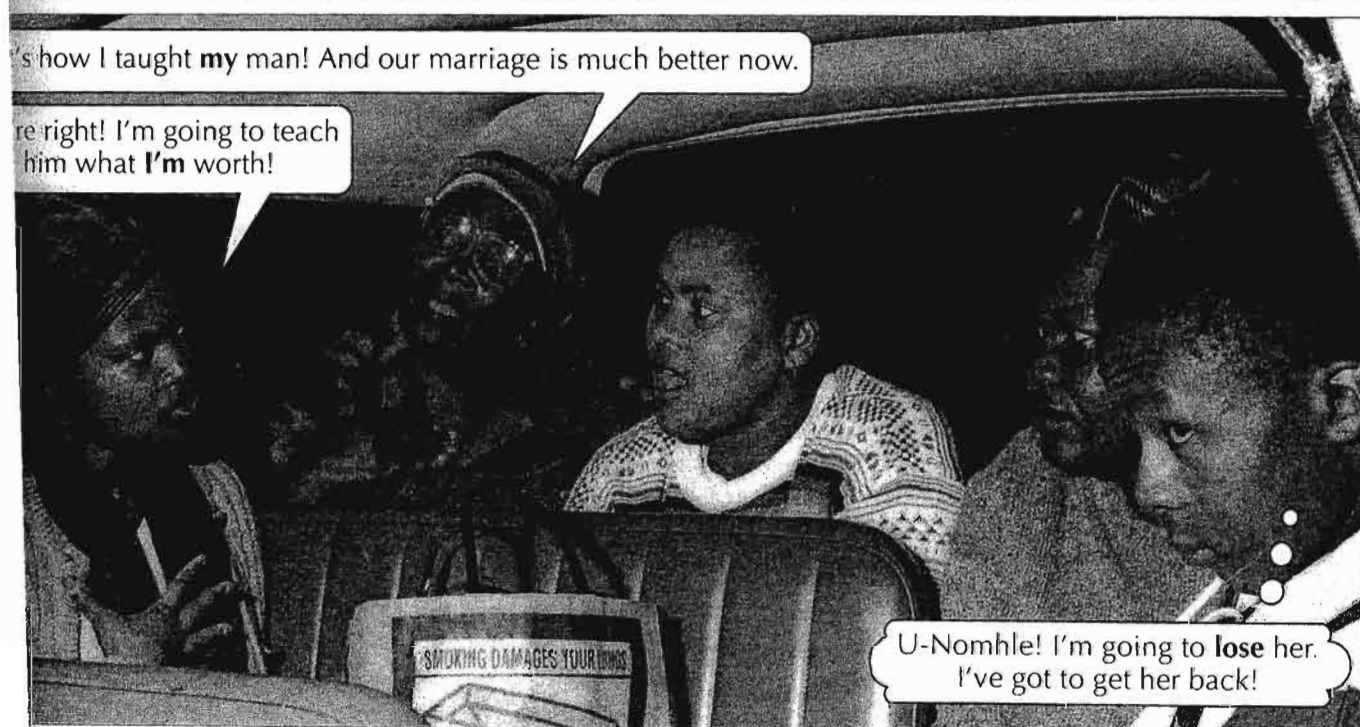


if I complain,
will lose him!

But if we women take a stand and refuse men
who behave like that, then they would learn!

And we'd stop getting idrop
and HIV and AIDS!

Maybe Nomhle
thinks that too!



's how I taught **my** man! And our marriage is much better now.

re right! I'm going to teach
him what **I'm** worth!

U-Nomhle! I'm going to **lose** her.
I've got to get her back!

SMOKING DAMAGES YOUR LINGS

CHAPTER 2

Chapter 2: Background and Literature Review

Adolescent sexuality education in South Africa

Adolescent sexual behaviour

The Health Belief Model

Social Learning Theory

Application of the theories

Evaluation

Evaluation of print media

2.1 Adolescent Sexuality Education in South Africa

Sexuality education for adolescents has been the focus of health education for a long time in South Africa. It has been delivered in the form of campaigns, talks and awareness workshops to address the issue of teenage pregnancy, and to introduce it into the school curriculum as family guidance (Varga & Shongwe, 1999). However, little is known about the impact of these programmes due to inadequate evaluation and lack of sustainability of the interventions.

The increase in sexually transmitted infections (STIs) and in particular HIV infection among adolescents has created a need for those involved with adolescent health and education, to intensify sexuality education and to evaluate its impact. The South African government's response is reflected in the development of an integrated plan for children infected and affected by HIV / AIDS (Draft National Integrated Plan, 2000). The Departments of Education, Health and Welfare are required to address the problem of HIV / AIDS by coordinating their initiatives to provide comprehensive and integrated programmes (Draft National Integrated Plan, 2000).

One of the proposed components to achieve this objective is through the introduction of a programme addressing life skills in schools (Draft National Integrated Plan, 2000). To date there is little scientific evidence that the HIV / AIDS awareness

campaigns and sexuality education programmes designed for South African adolescents result in any change towards adoption of safer sexual behaviours. Like other education programmes, interventions are not grounded in a theoretical understanding of adolescent sexual behaviour and are not premised on empirical data that may explain adolescent risk taking or risk reducing sexual behaviour (Schaalma, 1995, Reddy et al, 1999).

2.2 Adolescent Sexual Behaviour

Adolescent sexual behaviour rather than being highly related to any one factor that is considered to be an antecedent of behaviour, relates weakly to moderately, to several antecedents of behaviour (Kirby, 1997). The antecedents of behaviour are roughly divided into three groups: the first group includes the biological antecedents and are strongly related to sexual behaviour, namely gender, age, testosterone level and pubertal timing. The second group includes a large proportion of risk factors that can broadly be categorized as the factors contributing to social disorganisation or disadvantage. Some of these relate to parents' level of education, poor childrearing practices, mother/sisters' experience as an adolescent, drug use, inappropriate sexual pressure and even abuse, poor educational performance and low educational expectations. The third group of antecedents includes attitudes and beliefs directly related to sexual behaviour (Kirby, 1997).

Although sexual behaviour is a developmental task of adolescence, its unsafe practice has the potential to place adolescents at risk of teenage pregnancy and sexually transmitted infections including HIV. A review of studies showed that at least 50% of adolescents in South Africa are sexually active by age 16, and probably 80% by age 20. Therefore a greater understanding of the factors that promote or perpetuate unsafe sex in the South African context is needed (Eaton et al, 2003).

Unsafe sex amongst South African adolescents may be assessed by an analysis of the three domains pertaining to personal factors, the proximal environment (including interpersonal factors and immediate living environment) and the social context (including structural and cultural factors) (Eaton et al, 2003).

To date there have been numerous attempts to address the personal domain through education regarding HIV and AIDS through media campaigns. The effect of this education as reflected in cross sectional studies, suggests that while adolescents report having some knowledge about the various aspects of the HIV infection (causes and protection), there are discrepancies in their knowledge of the different aspects of the infection, for example about spread and prevention (Eaton et al, 2003; James et al, 2004). This either means that not all adolescents are being exposed to the media strategies to the same extent or that not all share the ability to assimilate the information in the same way. With regard to the latter, the factors that could possibly result in these differences may be the individual's level of self-esteem, self-efficacy, his/her perception of factors that facilitate or inhibit positive health behaviour as well as his/her beliefs and intention to perform the recommended behaviour. Further, for South African adolescents sexual health decisions appear to involve more than a rational process of individual decision-making. Several interpersonal processes that include negotiating condom use, peer pressure, cultural norms and interactions with significant others like parents and partners, influence such decisions.

Studies have shown that young women are vulnerable to HIV infection because of the stereotypes assigned to them. If they are seen to be "morally clean" their partners do not see condom use as necessary and this places them at risk especially if they are unable to negotiate condom use. Young women also find themselves at risk of sexual harassment when they become dependent on older men for money due to poor economic

circumstances, either to pay school fees or maintain their living standards (Jewkes et al, 2003). Further violence in the form of forced sex with an infected person, rape of a virgin to cure one's HIV status and female inability to negotiate condom use as a result of fear of violence, are argued to be the three mechanisms that make women more vulnerable to HIV infection (Jewkes et al, 2003; Maman et al, 2000; Leclerc-Madlala, 1997; Wingood & Diclemente, 1998).

Parental communication or supervision also appears to be a factor in determining adolescents' safe or unsafe sexual behaviour. Adolescents who find that they are unable to talk to their parents about sex and condom use are particularly at risk, because they do not choose the path of abstinence but rather engage in unprotected sex, for fear of getting caught with condoms, or they have hurried unprotected sex while their parents are out (MacPhail & Campbell, 2001). Protected or unprotected sex in adolescence is also the result of several factors that allude to accessibility of and knowledge about condom use. As opposed to not being able to access condoms, adolescents appear to have unplanned sex, and for this reason do not have condoms at hand when needed (MacPhail & Campbell, 2001).

This overview of adolescent sexuality is crucial and programme developers need to be vigilant in taking into account the many factors, particularly the social factors (Harrison, 2002), that impact on the individual's behaviour that remain outside his/her control (Eaton et al, 2003).

Therefore a comprehensive theoretical application to intervention development and evaluation research provides the framework that allows for rigorous evaluation of these factors. Without this component, programme developers cannot have confidence that they are addressing the salient factors that impact on sexual behaviour. A thorough assessment

of such factors at individual, interpersonal and structural levels within any target group needs to be undertaken.

Theories grounded in health and social psychology help to explain the interaction of these influencing factors, and behaviour is seen to be a function of beliefs and subjective evaluations of the health problem (Eaton et al, 2003). Among the many theories there are two that are particularly useful in this process: the health belief model (Rosenstock & Kirscht, 1974) and social learning theory (Bandura, 1962)

2.2.1 The Health Belief Model

The health belief model (HBM) explains behaviour as the interaction of two factors: the value an individual places on a goal, namely health behaviour, and the individual's belief that specific actions will achieve that goal (Petosa & Wessinger, 1990). The actions are adopted only if the individual perceives himself or herself to be at risk and the benefits outweigh the costs. This analysis of cost/benefit effect depends on the individual's perception of vulnerability to the illness. The issue of whether the illness can affect him or her personally and to what extent is weighed. The initiative to pursue a preventative path is cued, it is hypothesized by the HBM, by a personal encounter with the disease, such as knowing an infected friend, neighbour or family member. To date not many interventions have been developed and evaluated from a theory driven perspective, making it difficult to say with certainty where South African adolescents are placed in terms of their perceived vulnerability and reactions to this information. Studies that have assessed vulnerability report low levels of perceived risk of HIV infection, despite a history of unprotected sex and previous sexually transmitted infections. This finding appears to be related to the stigma associated with HIV and AIDS and was more prevalent among men than women (Eaton, 2003; Blecher et al, 1995; MacPhail & Campbell, 2001).

Awareness, according to the HBM, involves more than raising levels of knowledge, as knowledge alone is insufficient for adopting preventative health behaviour (Prewitt, 1989). Adoption of preventive health behaviour is achieved when the individual has assimilated the knowledge about his or her perceptions of vulnerability, perceives the severity of the problem and the benefits of the behaviour, is receptive to the cue and has the confidence and skills to perform the preventive behaviour (self-efficacy). Self-efficacy is an individual's estimation of his or her ability to cope with the possible barriers to performing the desired behaviour. Self – efficacy is shaped by the perceptions one holds about previous experiences with successes, failures and barriers. It affects what one chooses to do, how much effort is mobilized, how long one perseveres in the face of difficulties, and whether one engages in self-debilitating or self-encouraging thought patterns (Bandura, 1997). Studies amongst young adults have confirmed that there was a positive association between self-efficacy and condom use (Chapman, et al 1990; Richard & Van der Plight, 1991; Reddy et al, 2000).

The HBM further suggests that adopting the preventative action is weighed against the barriers to such action. The barriers and benefits to action are those social, physical and psychological determinants of behaviour that impact on health. The barrier to condom use for example is well documented (Reddy et al, 1999; MacPhail & Campbell, 2000; Reddy et al, 2000). A report that 45 % of young men responded that “condoms waste sperm”, shows that interventions developed to promote condom use need to first address such perceptions (Reddy et al, 1999). A table of the key concepts, definitions and application of the Health Belief Model as described by Glanz and Rimer (1995) has been adapted for local use and illustrated below (Table2).

Table 2: Health Belief Model Adapted for South African Adolescents

CONCEPT	DEFINITION	APPLICATION	EXAMPLE of APPLICATION
Perceived susceptibility	One's opinion of one's chances of getting a condition	Define population at risk. Personalize risk based on a person's behaviour Heighten perceived susceptibility if low	To get the learner to review own behaviour and understand the likelihood of getting STI infection
Perceived severity	Ones opinion of how serious a condition and its sequelae are	Specify consequences of the risk and the condition	Get the learner to understand the consequences of getting STI infection
Perceived benefits	One's opinion of the efficacy of the advised action to reduce risk or seriousness of impact	Define action to take: how, where, when; clarify the positive effects to be expected	Ensure learner knows what action to take (safe sex) and relates action to their future goals
Perceived barriers	One's opinion of the tangible and psychological costs of the advised action	Identify and reduce barriers through reassurance, incentives, assistance	To provide learners with skills to identify and overcome perceived barriers
Cues to action	Strategies to activate "readiness"	Provide how-to information, promote awareness, reminders	Expose learners to positive situations or people in a similar predicament; provide support for action taken
Self-efficacy	Confidence in one's ability to take action	Provide training, guidance in performing action	To provide individual with training in communicating and negotiating about condom use

2.2.2 Social Learning Theory

The level of interpersonal action, as detailed above, is explained by Bandura's social learning theory (SLT) and considers the reciprocal relationship between the individual and the environment. The environment includes those social influences such as the actions, thoughts and behaviours of significant others that influence the behaviour of the individual. There is a dynamic, continuous and responsive interaction between the individual and his or her environment. This means that the individual is capable of exerting influence as well as being influenced by the social environment.

According to Glanz and Rimer (1995) several reasons have been postulated as to why adolescents do not use condoms consistently. Some of the reasons are that they do not know what kind of condoms are best and how to use them properly; others fear that potential partners will reject them if they insist on condoms; and some who believe condoms are important find it hard to be assertive in intimate situations. The application of the social learning theory to these situations can be successfully used in health education strategies. In doing so the health behaviour is addressed from a range of perspectives that yield a picture of the determinants of the behaviour as well as the strategies to change the behaviour.

The theory therefore helps us to understand what causes the behaviour and what needs to be done to move towards the adoption of healthy behavioural practices. The key constructs, according to the social learning theory, that need to be addressed in a health education strategy that aims to change behaviour are behavioural capability, outcome expectations and self-efficacy. Information and training related to this will cover what the individual needs to know and how to do it; the expected results of the action as well as an assessment of the self-confidence an individual has to carry out a specified preventative action. In view of the complexity of the theory, a table of selected key concepts,

definitions and their application as drawn up by Glanz and Rimer (1995) as well as a category of examples of application as it pertains to South African adolescents is included below (Table 3).

Table 3: Social Learning Theory Adapted for South African Adolescents

CONCEPT	DEFINITION	APPLICATION	EXAMPLE of APPLICATION of THEORY
Reciprocal Determinism	Behaviour changes result from interaction between person and environment; change is bi-directional	Involve the individual and relevant others; work to change the environment, if warranted	To get the boyfriend to ask the girlfriend to accompany him to the clinic to ask the nurse for a condom. To get the nurse to provide courteous advice to the adolescent couple.
Behavioural Capability	Knowledge and skills to influence behaviour	Provide information and training about action	To educate the adolescent about the risk of re-infection if he/she has sexual intercourse without using a condom after being treated. To get the adolescent to practise suggesting using a condom to a partner and obtaining consent, as well as demonstrate the steps in using a condom effectively.
Expectations	Beliefs about likely results of action	Incorporate information about likely results of action in intervention	To get the adolescent to prepare for several potential expectations for example positive response to condom suggestion; aggressive response to condom suggestion; rejection response to condom suggestion.
Self-Efficacy	Confidence in ability to take action and persist in action	Point out strengths; use persuasion and encouragement; approach behaviour change in small steps	To get adolescent to verbalize feelings of confidence in personal ability about suggesting condom use to partner as well as using condoms.
Observational Learning	Beliefs based on observing others like self and / or visible physical results	Point out others' experience, physical changes; identify role models to emulate	To invite role models for example as Laduma portrays to discuss positive experiences with condom use.
Reinforcement	Response to a person's behaviour that increase or decrease the chances of recurrence	Provide incentives, rewards, praise; encourage self-reward; decrease possibility of negative responses that deter positive changes	To provide praise to the adolescent for taking action; for example Laduma reinforces decision to suggest condom use to partner

2.2.3 Theory of Reasoned Action

While the above two theories appear to explain the causal nature of behaviour, there is yet a further theory that addresses the predictive nature of behaviour. The Theory of Reasoned Action postulates that behaviour is a function of one's intentions to adopt a healthful action (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). Intention is seen as an immediate antecedent of actual behaviour, whereby the stronger people's intentions to engage in a behaviour or achieve their behavioural goals, the more successful they are predicted to be (Reinecke et al, 1996). Further, it is assumed that intentions are determined by one's attitude towards the behaviour and by perceived social pressure (subjective norms). The implication that intended behaviour is completely the result of one's personal control (volitional control) was later questioned and seen as a limitation of the theories. It was acknowledged that behaviours related to AIDS – risk reduction for example, were dependent on other people.

The health action was now seen as not being entirely within the individual's control but that performance of the behaviour required a degree of confidence (self-efficacy) that he/she can perform the behaviour apart from knowledge, skills and resources. Therefore intention, in the Theory of Reasoned Action, is seen as a function of three independent determinants, namely the attitude toward the behaviour, perceived social pressure to performing the behaviour and perceived control in performing the behaviour (Reinecke et al, 1996). The strength of these motivational factors determines the strength of the intention, which is predictive of the likelihood of the behaviour occurring.

Since all of these theories show some overlap, proponents of these theories of behaviour change have concluded, that there are three factors that most strongly influence health-related behaviours: the person's intention to engage in the behaviour, the lack of

any environmental constraints that might prevent the behaviour or the existence of any environmental resources needed to complete the behaviour, and the individual's skills (or ability to engage in the behaviour) (Fishbein et al, 1991; Kirby, 1997).

2.2.4 Application of the Theories

The use of the above theories has been widely used to influence behaviour of individuals in a largely Western culture. Its application to other settings, for example the African context, as well as the assumption that sexual behaviour is a rational process under one's volitional control has been questioned. There is a call for its use in the South African context to take into account the impact of the social context, in terms of culture and structural factors (urban versus rural, and poverty), on sexual behaviour (Eaton et al, 2003). Therefore South Africa will benefit largely from systematic planning, and implementation of determinants' studies that include questions pertaining to the subjective individual level, as well as the context within which sexual behaviour takes place. This will lend itself to meaningful intervention development for behaviour change among adolescents that is appropriate, useful and valid.

2.3 Evaluation

Evaluation is a process critical to programme development and implementation. It is the strategy to determine whether or not the intended programme achieved its objectives (Oakley et al, 1995). This is known as impact evaluation (Coyle et al 1991, Oakley et al 1995). It may be carried out through various designs, for example non-experimental, quasi-experimental or randomised controlled trials. The rigour with which the evaluation is carried out will reflect the efficacy of the programme on the target population. The randomised controlled trial is the method that best reflects the impact of an intervention,

as randomisation of subjects makes them comparable (Coyle et al, 1991). Therefore any differences in outcome measures in the intervention group post intervention are likely to be attributed to the intervention.

Evaluation of the implementation of a programme (process evaluation) is also useful to understand both the strengths of the programme and the barriers to its' effective implementation. A record is kept through observation or written notes to establish exactly what was done, when and to whom. Careful evaluation of interventions is necessary to determine the efficacy of such programmes as well as to inform future programme development and implementation.

2.3.1 Evaluation of Print Media

Print media is an effective way to reach large numbers of people. However, it is imperative to know whether the intervention makes a difference or not. A randomised controlled trial is one way of evaluating print media with the objective of determining the extent to which the intervention has had the desired effect. The desired effect, that is behaviour change, however, is usually only apparent years later. A method to evaluate the impact of educational material (print media) on risk behaviour is to evaluate the educational intention rather than outcome (Prewitt, 1989).

A review of effectiveness studies, (Redman et al, 1990), showed that most had major methodological flaws making effective interpretation of findings difficult. This study attempted to address some of the methodological flaws documented. These included the use of an appropriate control group, the collection of pre-intervention measures and random sampling. The review by Redman et al (1990), further showed that effectiveness studies failed to validate their data, a limitation that requires further investigation in future studies.

Of 41 research papers about evaluating HIV / STD interventions in developing countries that were reviewed, eight were school – based using a variety of methods to implement the intervention (MacPhail & Campbell, 1999). None of the methods included print media. Print media appears to be used for the wider population and the difficulties associated with the research is probably the reason why it is rarely evaluated and little comment can be made about its true value from the literature review carried out. Where print media as a form of mass media was evaluated, the pretest / posttest design was commonly used with very few studies using a quasi – experimental design incorporating a control / comparison group (Myhre & Flora, 2000). The same review also confirmed that evaluation of media campaigns did not report on the theoretical framework and campaign “dose” in the analysis. In assessing media campaigns several factors need to be fully considered to effectively analyse the impact of the material including, for example, the target audience, message content, presentation style, message appeal and outcome measures.

An evaluation of outcome measures related to mass media (print and radio) shows an emphasis on knowledge and attitudinal norms and less attention to measure behavioural change (Myhre & Flora, 2000; Yoder, Hornik & Chirwa, 1996). In the light of the importance of behavioural change to the maintenance of sexual health behaviours, Myhre & Flora (2000) reviewed several articles that proposed an increase in interpersonal communication about sexual issues pertaining to HIV and AIDS, as well as campaigns that influence the social norms about HIV and AIDS preventive behaviour. This builds a case for a multiple channel approach to health education, as opposed to a single channel of communication, which aims to effect individual as well as social change regarding health promotion. A South African example of this approach is the Soul City endeavour, an initiative that is grounded in entertainment with the focus on education and is reflective of

partnerships, social mobilisation activities and media advocacy (Singhal et al, 2002). “Soul City” as a mass media intervention employs a multimedia strategy to address priority national health issues through radio, television, and educational booklets that are distributed through major national newspapers. The appeal of these strategies is clearly the emphasis placed on developing the content on an ethical framework and values grid, reflective of the communities being targeted as well as the integration of such content with the theories that underpin behaviour change (Singhal & Rogers, 2001).

The main impact of print media on health promotion is that to date it has been known to increase awareness and knowledge and improve attitudes and perceptions of personal risk with regard to sexuality issues (Moatti et al 1992; Goldstein et al, 2002; Myhre & Flora, 2000; Yoder et al, 1996). Despite all of these being important preparatory work for the adoption of preventive behaviours, the challenge still lies in developing programmes that increase communication and hence the adoption of preventive behaviours. Communication is known to be central to preventive behaviour and a call for the development of appropriate physical and social environments is necessary to realize this (Rogers, 2000).

Owen and Lee (1986) emphasised that mass media interventions are often not based on a well-articulated conceptual base for the programme’s objectives and research design is not a part of the programme planning. They also state that print media in particular, when used in a self-instructional fashion are usually not assessed.

For those interventions focussed on sexual health issues that have been evaluated, it is further suggested by Agha (2002) that more rigorous assessments of the actual interventions need to be carried out, due to the low impact of interventions on behaviours. This is a suggestion supported by Kok (1992) who argues that the “potential success of a programme depends on the quality of the planning”. A systematic framework outlining the

relevant questions applicable to both the planning and evaluation phases is recommended. The planning questions are designed to critically assess whether a problem exists, the behavioural causes, and the best way to address the problem; while the evaluation questions yield answers about the process evaluation of whether the intervention was carried out and received as planned, as well as the outcome evaluation, that is the extent to which it changed the determinants and behaviours and reduced the problem.

CHAPTER 3

Chapter 3: Methodology

Study design
Study setting
Study sample
Study intervention
Study instrument and outcome measures
Data analysis
Consent / Ethical approval
Feedback to stakeholders

3.1 Study design

The study design was a randomised controlled trial (RCT), an experimental design using the school as the unit and measuring a range of outcomes between randomly allocated control and intervention groups of learners over three time periods - baseline (T1), post - test three weeks after the baseline (T2) and then six weeks after the post test (T3). Schools were randomly allocated to control and intervention conditions as described in The Consort statement of the Lancet, 2001. The suggested flow diagram for improving the quality of reports of parallel – group randomised trials was adhered to in allocating the groups, as well as in developing the analysis strategy to compare the groups at the three time periods to each other and across time.

Analysis of the participants lost to follow up was also undertaken and reported (Lancet, 2001). The recommended minimum time period between follow up sessions, that is two weeks between T1 and T2 and four weeks between T2 and T3, was adhered to, as advised by a statistician, to account for questionnaire effect on participants. Further the study design used a randomised controlled group and pretest-posttest design to explain threat to internal validity (Green & Lewis, 1986). The baseline differences were also analysed and controlled for in the analysis at T2 and T3.

3.1.1 Study setting

The study was carried out among secondary school learners in the province of KwaZulu Natal (KZN) South Africa, which has the largest school going population of over 2.7 million learners. The Midlands district in one of the eight regions of KZN, situated around Pietermaritzburg was selected as the study site. The reasons for this selection were that it has both rural and urban dwellers, is a largely isiZulu speaking population who comprise eighty per cent of the KwaZulu-Natal population and had no exposure to the intervention. The size of and distances within the district were manageable in terms of the budget allocated for the research evaluation. The public schools had similar infrastructure in terms of buildings, classrooms and ablution facilities. There was however a scarcity of recreational facilities at most of the schools and the surrounding areas.

3.1.2 Study sample

All of the twenty-seven secondary schools in the Midlands district were allocated numbers and twenty schools were randomly selected by number and allocated to intervention and control groups to participate in the study. Four of the schools refused due to time constraints (year end examinations). A further four were randomly selected from the remaining seven schools. Three of the schools agreed to participate resulting in a total of nineteen schools in the final sample. Two grade eleven classes were randomly selected by number from all grade eleven classes at each of the randomly selected schools in the study site. All learners from these classes present on the day of the survey were included in the study. This assured at least fifty learners from each school resulting in a sample size of 1168 at baseline.

The sample size, determined with the assistance of a statistician, based on the results of a pilot study was estimated from an expected change of 15% on a combination

of critical outcomes, such as, changes in knowledge about sexually transmitted infections, attitude towards preventive behaviours, communication with significant others about sexually transmitted infections and prevention and intentions for safe sexual practices. The final number of learners surveyed was in excess of the minimum required to allow for loss to follow up and for the study to have a power of 80%.

Some learners were lost to follow up over time and the specific reasons for this is unknown except that it was the end of the year and examinations were in progress. An analysis of the loss to follow up was done to ascertain in what ways, if any, these learners were different to the learners that remained in the study.

3.1.3 Sampling, Allocation and Phases of Study

The schools were randomly allocated to control (did not read Laduma) and intervention (did read Laduma) groups. There were ten control and nine intervention schools. All the learners from both the control and intervention schools were requested to respond to a baseline questionnaire, (T1).

The second phase took place three weeks later (T2). At this phase the learners in the control schools were administered the same baseline questionnaire. Learners from the intervention schools were given Laduma to read, a break and then answered a questionnaire, which had baseline and Laduma specific questions. Learners had to return Laduma and were only given a copy to keep on completion of the study. The reading of Laduma took about one hour.

The third phase (T3) was carried out six weeks after T2. The study was scheduled for the latter half of 1998 and to avoid going into the new academic year the follow up time was limited to six weeks. At this phase learners from the control schools repeated the baseline questionnaire and the learners from the intervention schools repeated their second

questionnaire. At the end of the study learners from the control schools were also given a copy of Laduma so as not to disadvantage any participant.

A limitation to the study was the high drop out rate of learners (38.2%), which was attributed mainly to the impending school examinations. This was due to learners unofficially staying away prior to examinations when formal lessons are completed. However, the study was scheduled for the latter half of the year and the examinations could not be avoided.

3.2 Study Intervention: A single reading of Laduma

The systematic participatory approach to the development of Laduma provided strong support for it to be used as the intervention instrument in this study as well as be evaluated amongst secondary school learners. Secondary school learners participated in the development of Laduma and were the group at which the educational information was aimed at.

The educational information in Laduma aimed to increase knowledge by providing factual information about sexually transmitted infections, through appropriate responses by the clinic nurse and discussion among friends in the story. Their responses are reinforced by a question and answer section at the back of the photo-novella. The use of condoms as a means of protection against sexually transmitted infections is clearly demonstrated by a set of colour photographs, illustrating the correct way to use a condom. Condom use, for sexually active adolescents, is the most effective primary prevention against sexually transmitted infections. Laduma through its emphasis on condom use, aimed to promote intentions to use condoms every time one had sexual intercourse. An intense discussion between the lead characters about their relationship, commitment to each other, and the role of condoms as part of their sexual lives, is well dramatised

following an incident of unfaithfulness on the part of one of the partners. This discussion shows the need for skills that enable effective communication, decision-making and ability to resist negative peer influences. Laduma, it was envisaged, could serve as an educational intervention to facilitate discussion in the classroom situation, as well as being read on its own.

3.3 Study Instrument, Data Variables and Outcome Measures

Questionnaire

A baseline semi-structured questionnaire based on the theoretical framework (described above) was used to collect data with respect to, the demographic characteristics of the learners, their knowledge including their general awareness and communication about sexually transmitted infections, their attitudes to condoms, to condom use and to people living with HIV and AIDS, their beliefs including their perceived personal vulnerability to sexually transmitted infections, their sexual behaviour and intended behaviour change, as well as their impressions of Laduma as an educational medium.

The questionnaire was pre-tested among sixty learners from secondary schools in the research area to ensure construct and face validity. The questionnaire was redeveloped taking into account the findings of the pilot study. This was mainly clarifying certain words by including the colloquial words in brackets. The questionnaire was retested after the pilot.

The follow up questionnaire for the intervention group, which was answered at T2 and T3, included all the questions from the baseline questionnaire and additional questions about intended sexual behaviour and the photo-novella. The latter questions were asked to determine the efficacy of Laduma as an intervention to promote safer sexual practices.

The control group was not given Laduma to read and answered the baseline questionnaire at all three times with the addition of the question about intended sexual behaviour at T3.

Most questions were closed, with yes, no and unsure responses. Some open questions were also used to enable learners to freely express their views. Learners who were supervised by a fieldworker and researcher individually completed the questionnaire, during a normal class lesson. As a result of the sensitive nature of some questions, measures were taken to ensure learners' confidentiality and anonymity. This was also done to reduce bias regarding self-report. Exaggerated reports of sexual behaviour were further minimised by assuring learners that code numbers were used and not names; teachers were requested not to be present during sessions and learners were encouraged to answer as honestly as possible (Jemmott et al, 1992; Jemmott & Jemmott, 2000).

The fieldworkers had a minimum of grade 12 education and some experience of working with adolescents. They were trained to administer and answer questions related to the questionnaire. They were also trained to do the coding of the questions as part of preparation of the data for computer input. Each phase of the study took about 2-3 weeks to collect the data. The survey was conducted in English, the language used for instruction at schools. Learners were given as much time as they needed to complete the questionnaire to allow for individual abilities. Time to complete the questionnaire varied between 30 to 50 minutes.

Outcome measures

The different outcome measures such as knowledge and attitudes were measured by a set of variables. To test if the variables were related to each other, factor analysis was used. The variables with a high loading (>0.4) were grouped to form a factor and then interpreted and given meaning. This method of devising the factor by subjective interpretation is recommended with the "assumption that the researcher is in tune with the

theoretical underpinnings of the data” (Breakwell et al, 1995). Factor analysis is therefore used when there is “a systematic interdependence among a set of variables and the researcher seeks to find out what creates the commonality of the variables to each other” (Reddy, 2002). Factor analysis also reduces the number of variables to analyse, as the new variable created is a scale comprised of the responses to several variables that are highly correlated to the new variable. These variables with a high correlation to the new variable are then subjected to a reliability test. A moderate to high alpha reading indicates that the individual variables share a commonality and are adequate to describe the concept captured by the scale (Tabaschnick & Fidell, 1996). This method was used to devise the scales for analysis in this study and is elaborated on below.

Knowledge

Knowledge about cause, spread, protection and treatment of sexually transmitted infections

At baseline several questions were asked related to causes, spread, treatment and methods of protection against sexually transmitted infections. The responses were coded to reflect the learners understanding about each of the statements. The coding for a desirable response was 1, unsure 0 and a response that was not desirable was -1. These coded responses were computed for each of the categories (causes, spread, protection and treatment). The computed results indicate the number of questions to which the learners provided the desirable response. For example for the question “Are sexually transmitted infections spread by food and utensils?; the coding was 1 for no, 0 for unsure and - 1 for yes.

The impact of Laduma on knowledge regarding causes and spread of sexually transmitted infections was measured by, four items for spread (Sexually transmitted

infections are spread by ... kissing, hugging, toilet seats, food and utensils where -1 = no, 0 = unsure, 1 = yes; (Cronbach's Alpha = 0.60); and three items for cause (Sexually transmitted infections are caused by having many sexual partners without using a condom, having unprotected sex with an infected person, using condoms where -1 = no, 0 = unsure, 1 = yes; (Cronbach's Alpha = 0.53), respectively.

Knowledge sources: Learners' sources of information about sexually transmitted infections

Several questions were asked to determine where learners get their information about sexually transmitted infections from, as well as the impact of these sources in terms of contributing to learners' general knowledge about sexually transmitted infections.

Knowledge sources: Learners' communication about sexually transmitted infections with significant others

Learners were asked whether they communicate about having sex, not having sex, HIV / AIDS, sexually transmitted infections and condom use to their parents, friends, and boy or girlfriend. Within the latter three groups, the items were combined to create adequately reliable scales measuring communication with parents (Cronbach's alpha = 0.77), communication with friends (Cronbach's alpha = 0.65), and communication with girlfriend/boyfriend (Cronbach's alpha = 0.68).

Attitudes

Attitudes to condom use

Learners' attitude to condom use was measured with seven items ("condoms take the fun out of sex, using a condom shows your partner that you do not trust him or her, condoms can harm your body, condoms are important to use every time you have sex, condoms work well to prevent the spread of AIDS, condoms prevent pregnancy, using condoms shows you care about partners' health"), which were combined in a moderately reliable index (Cronbach's $\alpha = 0.57$).

Attitudes to people with sexually transmitted infections or HIV and AIDS

Learners' attitude to people (friends) infected with sexually transmitted infections or HIV/AIDS was measured through three items ("If you had a friend with a sexually transmitted infection (with HIV/AIDS) would you stop being friends, continue being friends but keep your distance, continue being friends like now"), which were combined in a scale with adequate internal consistency (Cronbach's $\alpha = 0.70$).

Beliefs and perceptions about sexually transmitted infections

Five questions were asked to assess learners' beliefs and perceptions about sexually transmitted infections in terms of their own vulnerability as well as from a broader perspective.

Sexual behaviour

Sexual behaviour was measured by one item asking if one had had sex during a specified period prior to the survey. At baseline (T1) the previous six months and at T3 the previous 6 weeks (time since T2) was used. The responses were yes or no.

The number of reported partners was assessed at T1 and T3 through the question: how many girlfriends/boyfriends have you had sex with in the past 6 months. For both measures, outliers (i.e., 2 x SD above the mean) were removed from the analyses (range T1: 1-10; range T3: 1-15).

Condom use was measured by asking those who had sex during the specified period if they used a condom every time they had sex, sometimes or not at all. These responses were analysed by gender, and male participants responded positively about personally using condoms, whereas for female participants a positive response referred to their partners having used condoms.

Intention to use condoms in the future

Intention to use condoms in the future was measured only at T3 by one self-reported variable: What will your choice be for the next year? Alternatives were not to have sex, to have sex with a condom or to have sex without a condom.

Impressions about Laduma

Several questions were asked to assess learners impressions about Laduma in terms of its usefulness as a preventive educational intervention and its' appeal to adolescents.

3.4 Data Analysis

The baseline data was analysed using chi-square to test for significance. The level of significance was taken to be at $p < 0.05$.

The follow up data were analysed using analysis of variance with repeated measures in the case of interval level dependent variables (knowledge, attitudes, communication, and number of partners). For each of the repeated measures' analyses, only learners who had valid scores on all three measurements were included. Hierarchical logistic regression analysis was used in the case of dichotomous variables (having had sex, condom use, and intention to use condoms).

Tests of independence revealed that both the distribution of males and females and the distribution of first language (English versus isiZulu) differed for the experimental and control group, $\chi^2(1, n = 1164) = 8.30, p < 0.05$, and $\chi^2(1, n = 1152) = 20.24, p < 0.001$, respectively. Subsequent analyses controlled for the effects of these two variables in testing the impact of Laduma on the dependent variables. However, because no significant interaction effects between experimental-control condition and language were found on any of the dependent measures ($p > 0.33$), suggesting that learners' first language did not influence the impact of Laduma; language was included in the remaining analyses as a covariate instead of as an additional independent variable.

Gender status significantly moderated the effects of Laduma on some of the dependent variables and thus was included as an additional independent variable in all analyses reported.

3.5 Consent/Ethical Approval

Written consent was obtained from parents and the Department of Education. The learners were invited to participate on a voluntary basis. There were no refusals from the parents and only one learner refused to participate. The Faculty of Medicine, Nelson R. Mandela Medical School, University of Natal granted ethical approval for the study.

Confidentiality of learners was assured by keeping the questionnaires anonymous. Learners were assigned a number that was linked to their names and stapled onto each of the different rounds of questionnaires. At the beginning of each session they were requested to remove these pieces of papers and throw it away. Thereafter only the allocated number that was previously written in by researchers remained on the questionnaire. Learners were assured that there was no link to their names. They were requested not to write their names on the questionnaires. They were reassured that only the research staff had access to the data and the final reports and papers do not make reference to individual schools and learners.

3.6 Feedback to Stakeholders

A feedback meeting was held to brief managers of the school districts and school principals about the results of the study. This was done through a presentation and they were given a two page written summary of the findings. Principals were requested to share the findings with their schools.

CHAPTER 4

Chapter 4: Results
Randomisation and allocation of schools and learners to the study
Analysis of loss to follow-up
Learners’ responses to variables at baseline
Impact of Laduma on learners in the intervention group
Learners’ impression of Laduma
Summary of results

These results will be presented in four sections namely, (i) a flow diagram of the RCT study design with total number of schools (unit of sampling) and learners present at T1, T2 and T3 as well as learners lost to follow-up at T1, T2 and T3, (ii) an analysis of learners lost to follow-up, (iii) responses of learners at baseline (T1) and (iv) comparison of the responses of learners at T1, T2 and T3.

4.1 Randomisation and allocation of schools and learners to the study

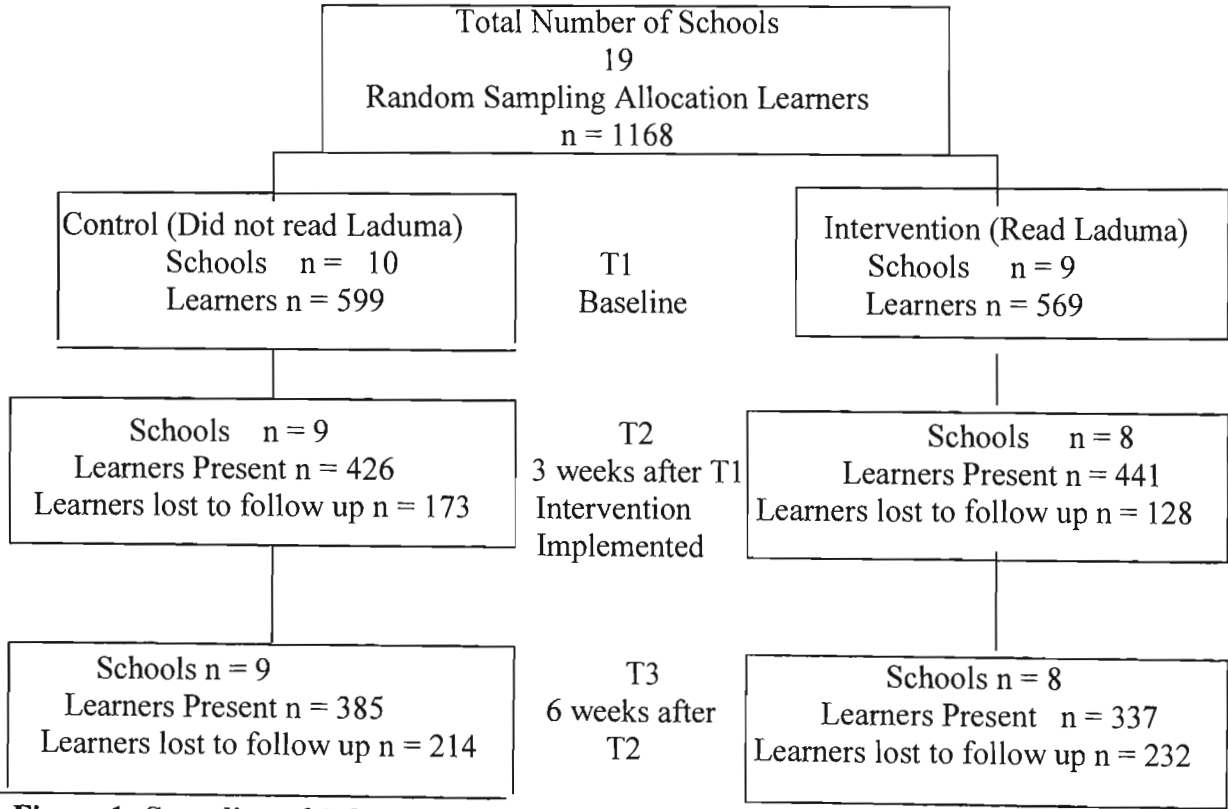


Figure 1: Sampling of Schools and Randomisation Framework (Adapted Lancet, 2001)

4.2 Analysis of loss to follow-up

Of the 1168 learners who filled in the questionnaire at baseline (T1), 951 learners (81.4%) answered at least one of the dependent measures at either T2 or T3. The remaining 217 learners (18.6%) failed to fill in the questionnaires at both T2 and T3. This latter percentage was not different between the experimental group (17.4%) and the control group (19.7%), $\chi^2 = 0.99$, $p = 0.32$. They also did not differ on several baseline measures for example knowledge about spread of sexually transmitted infections (Mean = 0.64 versus 0.71), $t(206) = 1.10$, $p = 0.29$, knowledge about causes of sexually transmitted infections (Mean = 0.28 versus 0.46), $t(185) = 1.93$, $p = 0.06$, attitude towards people with sexually transmitted infections (Mean = 0.40 versus 0.37), $t(198) = 0.47$, $p = 0.64$ and attitude towards condom use (Mean = 0.54 versus 0.51), $t(191) = 0.53$, $p = 0.60$.

However, scores on the baseline measures indicated that this latter group of learners who did not fill in questions at both T2 and T3 as compared to those who filled in questions at either T2 or T3 were older (Mean = 18.52 versus mean = 17.84), $t(1156) = 4.81$, $p < 0.001$ had less knowledge about the causes of sexually transmitted infections (Mean = 0.36 versus mean = 0.59), $t(1053) = 5.11$, $p < 0.001$, had less positive attitudes towards people with sexually transmitted infections and HIV/AIDS (Mean = 0.38 versus mean = 0.46), $t(1100) = 2.02$, $p < 0.05$, talked more with their boy- or girlfriend about sex issues (Mean = 0.41 versus mean = 0.31), $t(894) = 2.11$, $p < 0.05$, and had more sexual experience in the six months preceding the study (51.0% versus 41.6%), $\chi^2(1, n = 1117) = 6.01$, $p < 0.05$.

4.3 Learners' responses regarding their knowledge, attitudes, beliefs and perceptions, sexual behaviour and impressions of Laduma at baseline

The baseline results are presented as a cross sectional study of all learners' responses. The results in respect of significant differences between intervention and control groups were analysed and reported.

4.3.1 Demographic profile of all learners

Almost two thirds of the sample of 1168 participants was between the ages of 15 to 18 years old, with the youngest being fifteen and the oldest thirty-eight. IsiZulu was the home language of the majority of the learners. While 25 % indicated that English was their home language, it must be noted that English was the medium of instruction at the schools (Table 4).

Table 4: Socio-Demographic Profile of Secondary School Learners

	CONTROL GROUP				INTERVENTION GROUP			
Variables	Male	Female	Un-known	Total	Male	Female	Un-known	Total
Age (years)								
15-18	199(33.2%)	187(31.2%)	-	386(64.4%)	148(26.0%)	233(41.0%)	-	381(67.0%)
19-21	92(15.4%)	91(15.2%)	-	183(30.6%)	85(14.9%)	77(13.5%)	-	162(28.4%)
>21	12(2.0%)	15(2.5%)	-	27(4.5%)	6(1.1%)	13(2.3%)	-	19(3.3%)
Unknown	-	-	3(0.5%)	3(0.5%)	-	-	7(1.2%)	7(1.2%)
Total	303(50.6%)	293(48.9%)	3(0.5%)	599(100%)	239(42.0%)	323(56.8%)	7(1.2%)	569(100%)
Home Language								
English	111(18.5%)	69(11.5%)	-	180(30.0%)	53(9.3%)	54(9.5%)	-	107(18.8%)
Zulu	186(31.1%)	222(37.1%)	-	408(68.2%)	184(32.3%)	268(47.1%)	-	452(79.4%)
Other	2(0.3%)	-	-	2(0.3%)	1(0.2%)	2(0.4%)	-	3(0.6%)
Unknown	-	-	9(1.5%)	9(1.5%)	-	-	7(1.2%)	7(1.2%)
Total	299(49.9%)	291(48.6%)	9(1.5%)	599(100%)	238(41.8%)	324(57.0%)	7(1.2%)	569(100%)

4.3.2 Knowledge

Knowledge about the cause, spread, prevention of, and protection against sexually transmitted infections

Table 5 describes questions related to the causes, spread, treatment and methods of protection against sexually transmitted infections by group.

Computed results on the spread of sexually transmitted infections indicated that 79.1 % of respondents answered 3 – 5 questions correctly and 86.7% were in agreement that sexually transmitted infections are spread by unprotected sex.

Over 75 % of learners were in agreement on the questions related to the sexual causes of sexually transmitted infections, namely unprotected sex and having many sexual partners. Significantly more males than female respondents believed that girls were the cause of sexually transmitted infections ($p < 0.05$).

Learners' knowledge about the use of a condom to protect oneself against sexually transmitted infections was favourably reflected by the response rate of 86.2 %. However, the computed results on protection revealed that only 40.6 % of learners gave the expected answer for 3 out of 6 statements. This is lower than the computed results for knowledge about causes and spread of sexually transmitted infections but compares with the computed results of knowledge about treatment for which 42.5 % of learners gave the expected response for 3 out of 6 statements.

Table 5: Learners Knowledge about the Cause, Spread, Treatment of, and the Protection from, Sexually Transmitted Infections - Percentage

	CONTROL			INTERVENTION		
Knowledge Variable	% In Agreement	% Not In Agreement	% Unsure	% In Agreement	% Not In Agreement	% Unsure
Sexually transmitted infections Caused by						
Condoms	26.4	60.2	13.5	23.3	64.7	12.0
Contraceptives	15.3	60.0	24.6	13.1	57.8	29.1
Girls	44.1	33.8 *	22.1	40.6	27.1*	32.3
Witchcraft	15.8	53.9	30.3	17.2	51.3	31.5
Dirty blood	34.2	32.1	33.7	37.9	35.9	35.9
Unprotected sex	76.9	16.0	7.1	74.6	15.9	9.4
Having many sexual partners	81.4	11.9	6.7	78.2	14.4	7.4
Sexually transmitted infections are Spread by:						
Food and utensils	6.5	78.7	14.8	7.2	75.4	17.4
Hugging	2.6	89.9	7.5	3.8	87.5	8.7
Unprotected sex	88.4	7.0	4.5	84.9	10.5	4.6
Kissing	7.5	79.7	12.8	8.6	75.9	15.5
Toilet seats	11.7	67.9	20.4	14.4	64.0	21.6
A person protects oneself from getting an STI by						
Having one faithful partner	75.4	11.4	13.3	74.3	13.8	11.8
Kissing and cuddling only	48.4 *	33.3	18.3	41.9 *	32.3	25.8
Not having sex	63.0	26.6	10.4	60.4	24.5	15.1
Taking family planning pills	30.5	43.7	25.8	30.0	40.6	29.4
Using a condom	85.4	7.4	7.1	87.0	7.3	5.7
If you were on treatment, would you						
Stop the treatment when you felt better	12.6	68.7	18.5	14.2	68.9	16.9
Share treatment with a friend, if he / she needs it	41.2	43.8	14.8	36.1	50.0	13.9
Have sex without a condom	10.1	82.2 *	7.5	17.7	74.8 *	7.5
If you had an STI, would you go for treatment						
As soon as you have symptoms	70.8 *	6.9	22.3	61.3 *	10.5	28.2
No symptoms, but partner is infected	49.5	17.6	32.9	42.3	19.5	38.2

n = (1168) Bold = Desirable Response * = Significant Difference (p < 0.05)

The response to an open ended question about protection indicated that 81 % of respondents were able to suggest a way to protect themselves against sexually transmitted infections. This included the use of condoms, delaying sex and a combination of using condoms and being faithful to their partner. Almost eighty three percent of male learners and fifty three percent of female learners reported that they knew how to use a condom.

However in an open question that personalized whether a participant would know if he / she had a sexually transmitted infection, only 19 % knew the symptoms of sexually transmitted infections, 29 % were unsure and 24 % would consult a doctor for an examination or blood tests to be done. It must be noted that 28 % of the sample did not respond to this question.

Knowledge sources: Learners' sources of information about sexually transmitted infections

Of the respondents significantly more in the control group (83.7%) than the intervention group (75.8%) had heard people talk about sexually transmitted infections, while 70.3% in the control group and 57.4% in the intervention group reported that they knew what a sexually transmitted infection was, ($p < 0.01$). Significantly more learners in the control group than the intervention group were able to name a sexually transmitted infection ($p = 0.01$), (AIDS / HIV was listed by half the respondents and about thirty four percent listed 'idrop', a colloquial word for a sexually transmitted infection). The remainder detailed other individual conditions such as gonorrhoea, warts or a combination of conditions for example AIDS or idrop with thrush or herpes.

As depicted in Table 6, the most common reported source of information about sexually transmitted infections for both male and female learners was the media including

newspapers, magazines and television. Friends and clinics played an important role as sources of information to males and females respectively. Family was reported as the least accessed source of information. In terms of the group differences significantly more learners in the control group than the intervention group reported hearing about sexually transmitted infections from friends, teachers and family ($p < 0.01$).

Table 6: Secondary School Learners’ Sources of Information

Heard about sexually transmitted infections from:	MALE	FEMALE	P VALUE
Media	83,6%	84,6%	0.07
Friends	72,0%	64,2%	0.02
Clinic	53,0%	68,5%	< 0.01
Teachers	48,3%	50,9%	0.45
Family	33,6%	32,9%	0.42

n = 1168

Knowledge sources: Learners’ communication about sexual issues with significant others

Tables 7a –7c indicate that both males and females in the control and intervention groups communicated mainly with friends about sensitive issues. However there was a significant gender difference within the groups with regard to the communication topic. Significantly more male than female respondents in the intervention group talked about condom use and sexually transmitted infections than those in the control group. There was a significant gender difference within both groups with more males than females reporting talking about having sex to their partners.

Table 7a: Secondary School Learners' Communication with Parents

	CONTROL			INTERVENTION		
	M	F	P Value	M	F	P Value
HIV/AIDS	41.6	53.3	< 0.01	53.1	52.3	0.67
Condom use	37.9	41.2	0.36	48.1	33.9	< 0.01
Sexually transmitted infections	32.9	39.6	0.07	35.0	32.6	0.73
Having sex	29.2	28.9	0.69	39.7	25.2	< 0.01

n = 1168 **Bold = significant difference between gender within group**
M = Male F = Female

Table 7b: Secondary School Learners' Communication with Friends

	CONTROL			INTERVENTION		
	M	F	P Value	M	F	P Value
HIV/AIDS	70.1	81.3	< 0.01	76.2	75.5	0.54
Condom use	81.7	79.2	0.54	85.2	71.2	< 0.01
Sexually transmitted infections	61.1	67.0	0.37	65.1	54.6	0.04
Having sex	82.9	66.4	< 0.01	81.9	60.6	< 0.01
Not having sex	49.8	71.2	< 0.01	48.9	69.6	< 0.01

n = 1168 **Bold = significant difference between gender within group**
M = Male F = Female

Table 7c: Secondary School Learners' Communication with Partner

	CONTROL			INTERVENTION		
	M	F	P Value	M	F	P Value
HIV/AIDS	55.7	65.7	0.03	63.2	60.4	0.22
Condom use	63.9	61.0	0.39	74.2	64.7	0.01
Sexually transmitted infections	43.4	54.8	0.03	56.2	48.9	0.02
Having sex	64.2	51.7	< 0.01	77.8	50.9	< 0.01
Not having sex	39.1	59.7	< 0.01	44.1	61.1	< 0.01

n = 1168 **Bold = significant difference between gender within group**
M = Male F = Female

4.3.3 Attitudes

Attitude to Condom Use

Attitude to condom use was assessed by the responses to eight specific statements.

Table 8: Secondary School Learners' Attitude to Condom Use

Statement	CONTROL						INTERVENTION					
	% In Agreement		% Not In Agreement		% Unsure		% In Agreement		% Not In Agreement		% Unsure	
	M	F	M	F	M	F	M	F	M	F	M	F
Condoms take the fun out of sex	29.0*	17.0*	39.0	41.7	32.1*	41.3*	31.2*	18.8*	42.2	39.0	26.6*	42.2*
Condoms are embarrassing to use	17.4	12.5	61.3	54.5	21.3*	33.0*	15.5	14.8	61.8	53.9	22.7	31.3
Condoms can harm your body	5.2	10.4	72.3 *	55.6 *	22.5*	34.0*	9.4	13.0	24.4 *	35.9 *	66.2*	51.1*
Condoms are important to use every time you have sex	80.3	88.9	10.2*	4.5*	9.5*	6.6*	83.5	87.5	11.4*	4.7*	5.1*	7.8*
Using a condom shows partner that you do not trust him / her	25.9	23.8	56.3	58.3	17.7	17.9	31.9	26.5	59.2	55.2	8.8*	18.3*
Condoms work well to prevent sexually transmitted infections	74.7	75.5	6.1	6.2	19.1	18.3	81.4 *	72.8 *	6.4	7.5	12.3*	19.7*
Condoms also prevent pregnancy	84.9	82.4	4.8	6.6	10.3	11.0	89.4	83.8	5.5	6.2	5.1	10.0
Using a condom shows you care about your and your partners health	88.8	88.7	3.4	2.7	7.8	8.6	92.3	87.5	4.3	4.4	3.4	8.1

(n = 1168) **BOLD = Favourable or correct response** * = P < 0.05 between gender within groups M = Male F = Female

Although significantly more males in both the control and intervention groups believed that condoms take the fun out of sex, significantly more males in both groups also believed that condoms are not embarrassing to use and do not harm the body, respectively ($p < 0.05$). Both males and females (68.4%) responded favourably to more than four of the eight statements.

4.3.4 Learners' beliefs and perceptions about sexually transmitted infections

In response to five questions about learners' beliefs and perceptions about sexually transmitted infections both males and females reported that sexually transmitted infections were a serious health problem for adolescents. More than half of the respondents (of both sexes and in the control and intervention groups) feared that they were at risk of getting a STI. This response decreased (for both males and females), when considering their vulnerability over the next two years with significantly more intervention versus control respondents reported knowing a friend with a sexually transmitted infection ($P=0.01$).

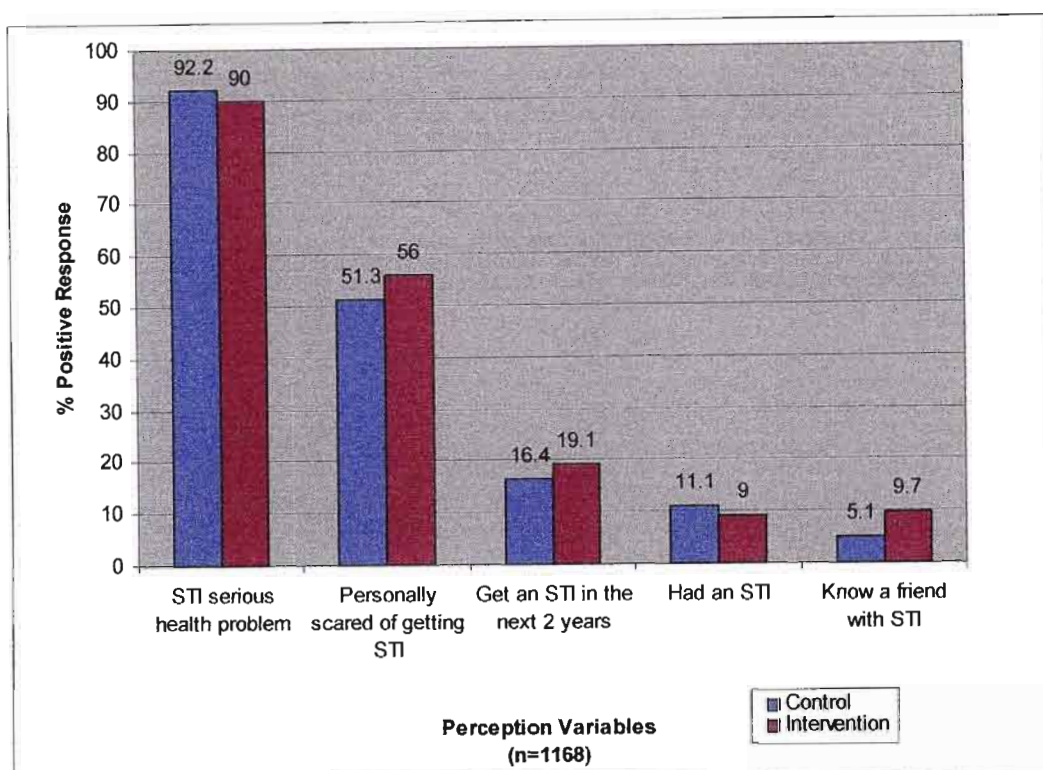


Figure 2: Perception of STI Problem among Secondary School Learners

4.3.5 Sexual practices and condom use

A question about the right age to start having sex indicated that 47.8 % of the learners were in agreement with the age category 15 – 19 years old. There was a significant gender difference within the control group and between female respondents in the control and intervention groups ($p < 0.05$).

Of the sample 43.3 % reported having been sexually active in the past six months, with significantly more being male learners 53.2 % compared to female learners 34.3% ($p < 0.05$). This statistically significant gender difference was found in both the control and intervention groups ($p < 0.05$).

Of the learners reporting positively to having had sex in the past six months 77 % were between the ages of 15 to 19 years old, and 35.7% reported not having used a condom at all. Of the learners reporting using condoms 35% indicated using a condom

every time and 40.1% sometimes. For 76.6 % of the learners the clinic was the main source for condom acquisition. Of the male learners who did not use condoms 41.9% reported that it was due to personal preference. However, only 22.1% of female learners reported that their partners refused to use condoms. There was no significant difference between control and intervention groups in response to this question.

4.3.6 Learners' impressions of Laduma

The learners in the intervention group were asked a series of questions about Laduma to assess their appreciation of it as educational print media. The majority (89% – 95%) of the learners reported that they thought Laduma was interesting, easy to understand and educational. Even though 90% were Zulu speaking, 75% reported a preference for reading it in English and the remainder would have preferred it in isiZulu.

They disagreed with less positive statements, for example 67% disagreed that their friends will laugh at them if they used condoms, and agreed with positive statements such as condoms protect against sexually transmitted infections (77%). A substantial percentage of unsure responses to statements, for example, condoms are not a part of your culture (25.2%), a condom may slip and get stuck inside a girl (38.8%) and my girlfriend/boyfriend will not want to use a condom (23.7%), were reported. The question addressing learners' health seeking behaviour as to where they will go for treatment if they had a sexually transmitted infection showed that 94 % will go to a clinic / doctor, 26% to a sangoma and 27% to both the clinic / doctor and the sangoma.

In terms of relationships and safe sex, 88.1% and 93.3% of learners reported that Laduma taught them that faithfulness and honesty to your partner is good and that condoms should be used to practice safer sex respectively.

Ninety one percent of learners reported that they thought it was a good idea to use a photo-novella to convey a message on prevention of sexually transmitted infections. Learners also felt that such a medium was entertaining (71%) and the language used was similar to the way people normally speak (83%).

There were no statistically significant differences in the above responses with regard to gender or across time (when repeated at T3).

4.4 Responses of learners in the intervention group after a single reading of Laduma compared to the control group at T1, T2 and T3

The following results obtained at T1, T2 and T3 outline the impact of Laduma on the intervention group on several variables compared to the control group. The variables that showed a significant difference between the intervention and control groups after the intervention group was exposed to Laduma, are reported on below, for example, knowledge about causes and spread of sexually transmitted infections and attitudes towards condom use and towards friends infected with sexually transmitted infections or HIV / AIDS.

An example of a variable that did not show a significant effect after reading Laduma was communication between partners. Analyses of this variable showed that there was no significant difference between control and intervention groups at baseline, $F < 1.00$, non significant. There was no significant difference in the mean scores between measures in the intervention group (p 's > 0.12). Laduma therefore did not have a significant effect on communication with ones' partner. The mean scores for participants in the control group between T1 and T2, $t < 1.00$, ns and T2 and T3, $t(184) = 1.84$, $p < 0.07$, was non significant. However, the mean score difference between T1 and T3 was significant, $t(184) = 2.30$, $p < 0.05$.

Reported sexual behaviour, condom use and intentions towards safer sexual behaviour of the intervention group compared to the control group are also reported on.

4.4.1 Impact of Laduma on knowledge

Knowledge about causes of sexually transmitted infections

The significant interaction effect of Gender, Group, and Time revealed that the two-way interaction effect of Group and Time was significant among females, $F(2, 288) = 4.50$, $p < 0.05$, but not among males, $p = 0.64$. Further analyses focused on female participants and revealed that for female participants their knowledge of the causes of sexually transmitted infections did not differ between the intervention and control group at baseline, $p = 0.71$, nor at T2, $p = 0.77$ (Figure 3a). However, the knowledge of the causes of sexually transmitted infections amongst females was significantly higher in the intervention group than in the control group at T3, $F(1, 288) = 10.85$, $p = 0.001$. Analyses within the intervention group indicated that mean scores did not differ between T1 and T2 ($p = 0.75$), but that there was a significant increase between T1 and T3 ($p < 0.01$) and between T2 and T3 ($p < 0.01$). Within the control group the changes between the different measures, T1 and T2, T2 and T3 and T1 and T3 were not significant ($p > 0.21$).

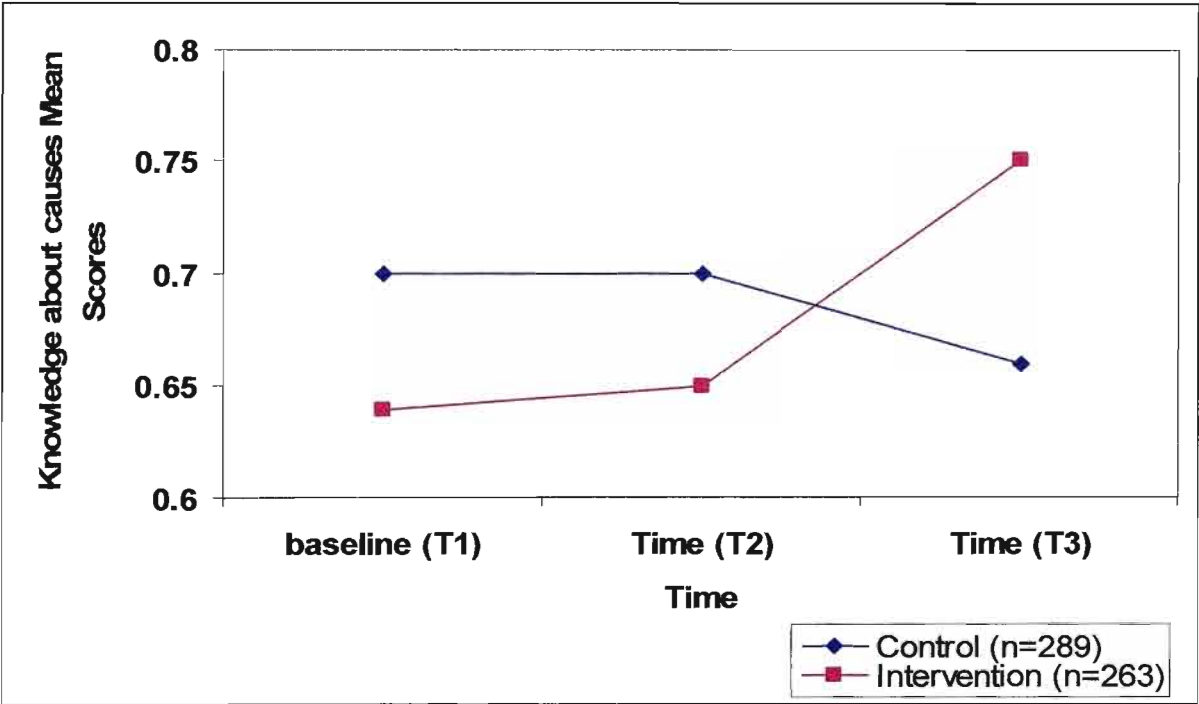


Figure 3a: Female secondary school learners’ knowledge about the causes of sexually transmitted infections over three time periods by group

Knowledge about the spread of sexually transmitted infections

A detailed analysis of the significant interaction effect of the intervention (Group) over the three time periods (Time) on knowledge about spread of sexually transmitted infections was undertaken. This showed that the knowledge levels of the intervention group and the control group did not differ at baseline, $F(1, 583) = 0.18, p < 1.00$. However, an effect of Group was found both at T2, $F(1, 582) = 6.87, p < 0.01$, and at T3, $F(1, 582) = 13.83, p < 0.001$. At both T2 and T3, participants in the intervention group had greater knowledge about the spread of sexually transmitted infections than participants in the control group (see Figure 3b). Analyses of the differences between mean scores within the intervention group showed that the knowledge about spread of sexually transmitted infections significantly increased at T2 as compared to the baseline ($p < 0.001$), and was maintained at the same high level at T3 (T1 versus T3: $p < 0.001$; T2

versus T3: $p = 0.88$). Within the control group the differences between the different measures were not significant ($p > 0.06$).

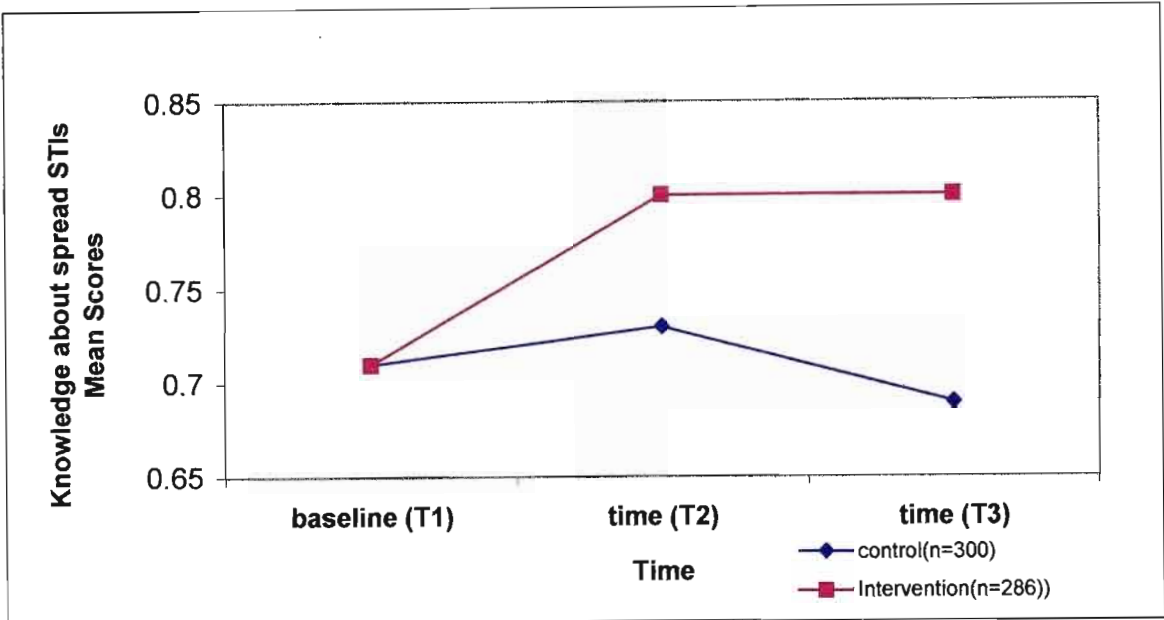


Figure 3b: Secondary school learners' knowledge about the spread of sexually transmitted infections over three time periods by group

4.4.2 Impact of Laduma on attitudes

Attitude towards condom use

Analysing the interaction effect of Group and Time on attitude towards condom use, no difference was found between the intervention and control group at baseline, $F(1, 543) = 1.12$, $p = 0.29$. An effect of Group was found in the predicted direction at both T2, $F(1, 542) = 19.40$, $p < 0.001$, and T3, $F(1, 542) = 18.83$, $p < 0.001$. At both post-tests, participants in the intervention group had a more positive attitude towards condom use than participants in the control group (Figure 3c). Analyses of the differences between mean scores within the intervention group showed that the positive attitude towards

condom use significantly increased after reading Laduma (T2) compared to the baseline level ($p < 0.001$), and that this was maintained at the same level at T3 (T1 versus T3: $p < 0.001$; T2 versus T3: $p = 0.96$). Within the control group there was no significant difference between the three time measures ($p > 0.30$).

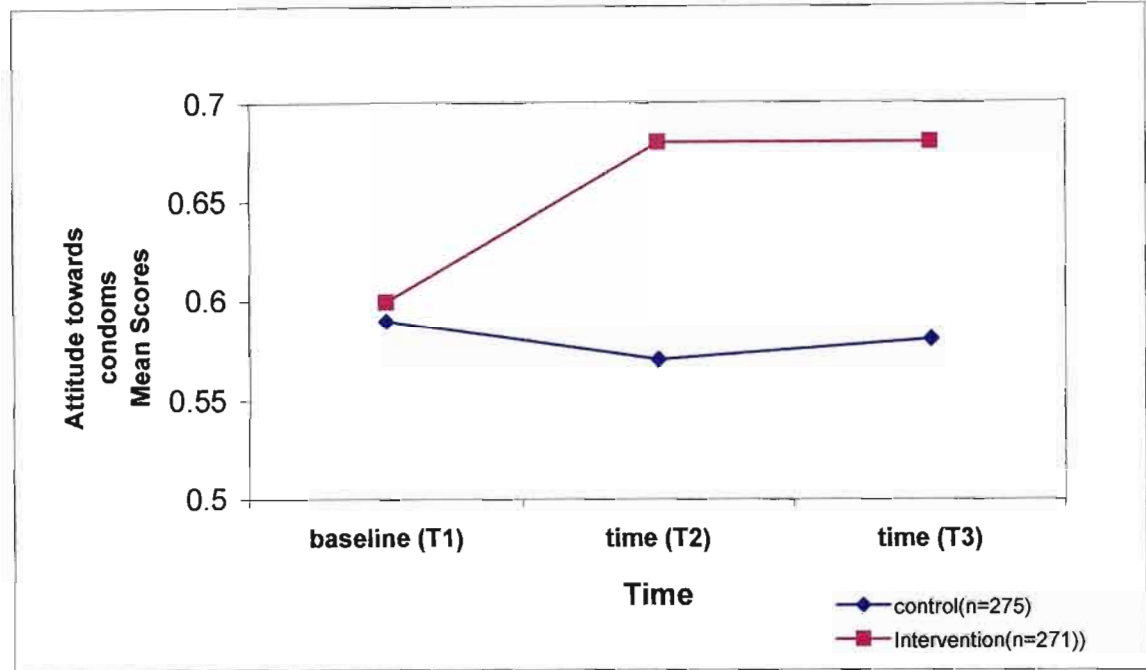


Figure 3c: Secondary school learners' attitude towards condom use over three time periods

Attitude towards friends infected with sexually transmitted infections or HIV/AIDS

The significant three-way interaction effect of Gender, Group and Time revealed that the two-way interaction effect of Group and Time was significant among males, $F(2, 269) = 3.31$, $p < 0.05$, but not among females, $F < 1.00$, ns. Further analyses focused on male participants and revealed that within this group the attitude towards friends with a sexually transmitted infections or HIV/AIDS (PWA) did not differ between the intervention and control group at baseline, $F(1, 275) = 1.47$, $p = 0.23$, nor at T2, $F < 1.00$, ns. Laduma therefore did not have the expected effect at the direct follow-up measure (Figure 3d). However, for males the attitude towards relationships seemed to be more positive in the

intervention group than in the control group at T3, but this effect was not statistically significant, $F(1, 269) = 3.05, p = 0.08$. Analyses of the differences between mean scores among male learners within the intervention group showed that the attitude towards friends with a sexually transmitted infection or HIV/AIDS did not differ between baseline and T2 ($p = 0.54$) or between T2 and T3 ($p = 0.08$).

Differences between the mean scores among male learners within the control group were not significant at T1 and T2, T2 and T3 and T1 and T3 ($p > 0.10$).

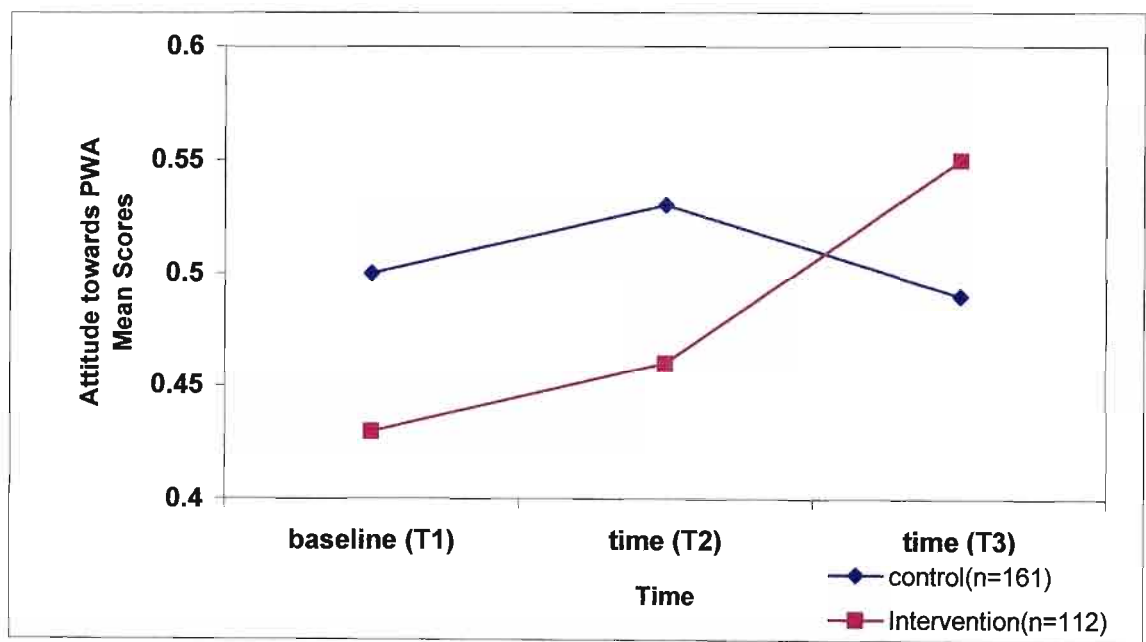


Figure 3d: Male secondary school learners’ attitude toward friends with a sexually transmitted infection or HIV / AIDS

4.4.3 Impact of the Laduma on sexual behaviour, condom use and intended behaviour

Sexual behaviour

Of all learners ($n = 1168$) 43.3% reported having had sex in the last six months before the study, with the percentage of male learners that was sexually active being higher (53.6%; $n = 281$) than the percentage of female learners (34.2%; $n = 202$), $\chi^2(1, n = 1115)$

= 42.48, $p < 0.001$. At baseline no significant difference were found between the percentage of learners in the intervention group that were sexually active in the last six months (43.9%; $n = 240$) and those in the control group (42.8%; $n = 244$), $\chi^2 (1, n = 1117) = 0.13$, $p = 0.72$.

The interaction effect between gender and group made no significant contribution to the prediction of having had sex in the six weeks following the intervention, Wald = 0.79, $p = 0.37$. Further, the intervention (group) had no significant effect on self-reported sexual activity during the six weeks after reading Laduma, Wald = 0.02, $p = 0.88$. Sexual activity at the last measurement was strongly predicted by sexual activity in the six months prior to the study, Wald = 82.33, $p < 0.001$, and to a lesser extent by Gender, Wald = 20.72, $p < 0.001$, with the percentage of males that were sexually active in the six weeks between T2 and T3 being higher (42.5%) than the percentage of females (21.9%). Language did not contribute to the prediction of sexual activity, Wald = 2.57, $p = 0.11$.

Condom use

Of all learners who at baseline reported having had sex in the six months preceding the study ($n = 484$), 42.4% reported having used a condom every time they had sex. For those in the control group this percentage (45.0%; $n = 107$) was not significantly different from the percentage of those in the intervention group (39.8%; $n = 94$), $\chi^2 (1, n = 474) = 1.28$, $p = 0.26$. However, this percentage (learners who reported using a condom every time they had sex) was significantly higher for male learners (48%; $n = 132$) than for female learners (34.8%; $n = 69$), $\chi^2 (1, n = 473) = 8.16$, $p < 0.01$.

Consistent condom use at six weeks after the intervention was predicted by past condom use (6 months preceding the study), Wald = 47.02, $p < 0.001$. All other covariates, namely condom use at baseline, language, group and gender, had no significant

predictive value ($p > 0.25$). The interaction between group and gender was also not a significant contributor to the prediction of consistent condom use, Wald = 1.88, $p = 0.17$.

Of all learners who had sex during the six months before the study and did not consistently use condoms, 75.2% ($n = 103$) of them also did not consistently use condoms during the six-week period after the intervention. Of the learners who had sex six months prior to the study and reported consistent condom use during that period, 71.6% ($n = 73$) of them also reported using condoms consistently in the six-week period after the intervention. The intervention (reading Laduma once) thus had no significant effect on consistent condom use six weeks later.

Intended behaviour

At T3 learners were asked about their intended choice with respect to preventive behaviour for the next year. Of all learners in the control group ($n = 346$), 41.9% intended not to have sex, 52.3% intended to have sex with a condom, and a small minority of 5.8% intended to have sex without a condom.

For the learners in the intervention group ($n = 292$) these percentages were significantly different, $\chi^2 (2, n = 516) = 8.19, p < 0.05$, with 28.1% intending not to have sex, 65.1% intending to have sex with a condom, and 6.8% intending to have sex without a condom. More learners in the intervention group than in the control reported an intention to have sex with a condom.

Another hierarchical stepwise logistic regression analysis was performed with learners who intended to practice safe preventive behaviours (abstinence or consistently using a condom; $n = 598$) versus learners who intended to have sex without a condom ($n = 40$) as the dependent variable. Of all the covariates language, group, gender and past sexual experience, gender was the only variable that significantly predicted intention to

practise safe preventive behaviours, Wald = 4.77, $p = 0.03$ (all other $p > 0.20$). Male learners (8.9%) were more likely to choose sex without a condom than female learners (3.9%). The interaction term of group and gender had no significant contribution on the prediction of intention at T3, Wald $n = 1.96$, $p = 0.16$.

A further hierarchical stepwise logistic regression analysis was undertaken on all learners who intended to have safe sex with a condom ($n = 371$) or to abstain from sex for the next year ($n = 227$), with the intention to analyse which variables explained the kind of preventive behaviour of their choice (abstinence or condom use). After removing the interaction term, Wald = 0.05, $p = 0.82$, the variables that significantly contributed to the prediction of the kind of safe sex choice were gender, Wald = 59.50, $p < 0.001$, Group, Wald = 21.70, $p < 0.001$, and past sexual behaviour, Wald = 21.13, $p < 0.001$.

Of the learners in the intervention group 69.9% intended to have sex with a condom as compared to 55.5% in the control group, while 30.9% intended to abstain from having sex as compared to 44.5% in the control group. Male learners reported a higher intention (79.54%) to have sex with a condom than female learners (47.0%). Just over half of the female learners (53.0%) intended to abstain from sex in the next year against 20.5% of the male learners. Learners who had sex in the past had a much higher intention (78.9%) to have sex with a condom for the next year than learners who had not yet had sex (52.3%).

4.5 Summary of results

This study investigated adolescent sexuality in terms of their existing knowledge with regard to sexually transmitted infections. It confirmed that this group of adolescents see themselves as less vulnerable than their peers with regard to health problems such as sexually transmitted infections and HIV / AIDS. The participants appear to have an

adequate awareness about sexually transmitted infections and have their preferences as to whom they talk to about such issues, namely friends and clinic staff. They also showed a difference about what they talk about, for example female participants appear to talk about not having sex to their partners, while male participants talk about having sex to their friends.

After a single reading of Laduma learners in the intervention group showed a change in their knowledge about spread of sexually transmitted infections and attitude towards condom use. This change was maintained for at least six weeks after the intervention. A change was also found for causes of sexually transmitted infections but amongst the female participants of the intervention group only. There was also a gender difference found with regard to attitude towards friends infected with a sexually transmitted infection or HIV / AIDS. Laduma seemed to have had an impact only on male participants. After six weeks, those who read Laduma had a more positive attitude towards infected friends than those who did not read Laduma.

Sexual behaviour in terms of consistent condom use was not influenced by the intervention. However, more learners in the intervention group reported intending to have sex with a condom in the next year if applicable. Gender, group and past sexual behaviour were found to significantly contribute to the prediction of the kind of safe sex choice participants would make, that is, abstinence or sex with a condom.

Learners overall reported an appreciation for Laduma as an educational tool aiming at preventing sexually transmitted infections.

CHAPTER 5

Chapter 5: Discussion

Main findings and impact of Laduma

Evaluation

Value and limitations of print media

5.1 Main findings and impact of the intervention (Laduma)

The study examined some of the personal and proximal determinants of sexual behaviour at baseline (knowledge, attitudes and beliefs) in the context of the learner's exposure to information from the media, family, friends, clinics and teachers. It further evaluated the impact of a photo-novella Laduma on learners, which they had to read without facilitation.

5.1.1. Knowledge

Knowledge about the cause, spread, protection and prevention of sexually transmitted infections

Despite their existing knowledge and the perception that learners have adequate knowledge, a single exposure to Laduma was able to significantly increase knowledge about the cause of sexually transmitted infections in female learners and knowledge about the spread of sexually transmitted infections in male and female learners. This indicates that there will always be a need for updated information (MacPhail & Campbell, 2000) and its value can be enhanced by programmes that present information in combination with strategies that help to translate knowledge into behavioural action. This is possible if adolescents are afforded the opportunity to observe desired behaviours in a safe environment under controlled circumstances.

Health education that is theory-based and uses the techniques of social learning theory that is modelling and skill training can develop self-efficacy in adolescents. The opportunity to observe health-enhancing behaviours modelled preferably by peers through role-play develops the confidence that the learner requires to perform the behaviour. According to Bandura's skill training technique the desired behaviour (condom use) is broken down into tasks such as condom purchase, condom negotiation, putting on a condom and removing it. The accomplishment of the tasks in a sequential order culminates in the behaviour.

Effectively planned and developed print media may be used as a tool at this stage to model the desired behaviour. Health education undertaken in this manner may help to address the gender differences with regard to knowledge and communication about topics related to sexual behaviour. It would appear that female participants were more restricted about what they talked about and to whom. It is possible that their reduced conversational ability about sexual topics limited their knowledge acquisition about the causes of sexually transmitted infections that the male participants appeared to have gained. The overall discrepancy between knowledge, positive attitudes to condom use and reported unsafe sexual behaviour confirmed previous findings that engaging in health protective behaviour requires, apart from knowledge, social and self-regulative skills and a sense of personal power to exercise control over sexual situations (DiClemente, 1992).

Knowledge sources: Learners' sources of information about sexually transmitted infections

The results suggest that different information sources as well as the exposure to Laduma have been successful in raising knowledge and awareness, evident by the high levels of knowledge about causes and transmission of sexually transmitted infections and

the acceptance of condoms as a means of protection. These findings were consistent with other studies of evaluation of school – based programmes which also showed a difference in knowledge and / or positive attitude to condom use and people with AIDS (Svenson, Carmel and Varnhagen, 1997; Merson et al, 2000; Khun et al, 1994). This suggests that health promotion interventions are likely to have some effect, especially on knowledge and attitudes. Reported behaviour changes however are not frequently documented and perhaps require more intensive programmes, which have a clear focus of at least one behavioural change as an outcome (Kirby, 1997).

Knowledge sources: Learners' communication about sexual issues with significant others

The results of the exposure to Laduma showed that the intervention had no significant effect on reported communication with boy or girlfriends, with other friends or with parents, about sexually transmitted infections and HIV/AIDS, or about prevention of infection.

Communication is behaviour and this finding shows that Laduma did not successfully alter this aspect. It is possible that the complexity of the behaviour required more than a single reading of Laduma and points to the need for print media being used in combination with other strategies. Strategies such as modelling could be used to explore pertinent issues, at the same time demonstrating the skill involved in communication about sensitive topics.

The small but significant increase in communication with a partner about sexually transmitted infections between T1 and T3 was an unexpected finding. It could be that the learners in the control group were sensitised after completion of the two questionnaires on

sexually transmitted infections, and were prompted to talk with their partners. Learners in the intervention group may have found these answers to some extent by reading Laduma.

5.1.2 Attitude

Attitude to condom use

The shift in attitude of both male and female learners in the intervention group to a more positive attitude to condom use at both the follow up surveys after reading Laduma is heartening, as the attitudes frequently associated with condom use are that condoms decrease the physical pleasures of intercourse, discussions about condom use are embarrassing and women carrying condoms are perceived to be sexually promiscuous (Hocking et al, 1999; MacPhail & Campbell, 2001). However, it is fully acknowledged that attitudes towards condom using behaviour are only one aspect of moving towards consistent condom use.

More success in this direction will be achieved when condom-using behaviour is addressed taking into account the context within which it happens. Condom use requires the confidence to communicate with a partner about using condoms, dispelling the feeling of invulnerability, the ability to make decisions and the skill to use a condom as well as access to condoms. All of these are viewed as determinants of condom use, and highlight the complexity involved in shifting people towards consistent condom using behaviour. Therefore, programmes need to be well planned and have a clear focus of the specific factors that influence the target group.

Attitude towards friends infected with a sexually transmitted infection or HIV / AIDS

The finding in this study showed that male learners reading Laduma reported a more positive attitude towards friends infected with a sexually transmitted infection or

HIV/AIDS, lasting at least six weeks. This finding probably results from the fact that exposure to Laduma stimulated male participants to talk about HIV / AIDS and people affected by it. Laduma did not make a difference to female participants in the same way, possibly because at baseline they reported that they do talk about HIV / AIDS to significant others. This change of attitude in male participants is important in influencing their intentions to use condoms, as well as in creating a social environment that is supportive of people living with HIV/AIDS, a condition often perceived as threatening and stigmatising.

5.1.3 Learners beliefs and perceptions about sexually transmitted infections

Assessment of the baseline findings showed that adolescents have an unrealistic perception of vulnerability and an optimistically biased assessment of their comparative risk in terms of being affected by sexually transmitted infections. They rated themselves to be less infected by such infections than their peers, a perception that is fundamental to understanding precautionary behaviour (Snyder & Rouse, 1995). Weinstein (1984) also reported that preventive health behaviour results from a perception of vulnerability.

Further, application of variables from the health belief model to a study, found that an association existed between perceptions of personal risk and use of condoms (Basen-Engquist & Parcel, 1992). Such evidence compels one to include those strategies, in interventions aimed at learners, which will influence their personal vulnerability and increase learners' perception of personal risk. Such a strategy may help to eliminate a false sense of protection that prevents them from taking protective action and may enhance condom-using behaviour.

However, Reinecke et al (1996), caution that sexual behaviour is not under volitional control but requires the cooperation of others, and they propose that in developing interventions other theories that include skills and self efficacy need to be applied as well. It is also important, as shown in this study, that the wide age differences and hence developmental stage of the adolescent be taken into account and concepts associated with adolescent health behaviour like “it can’t happen to me” and age-graded behaviour need to be addressed. Curtis (1992) also suggests the use of psychosocial theories such as social learning theory. This theory helps explain “normal” development, and how role models through vicarious reinforcement influence the adolescents either positively or negatively.

This insight may be applied to intervention development to present healthful behaviours to adolescents in a way that appeals to them and influences them positively, as the photo-novella Laduma sought to do. However the finding of the lack of change in learners’ behaviour in this study confirms that attention needs to be given to developing learners’ skills as well.

5.1.4 Sexual behaviour, condom use and intended behaviour

In assessing learners’ reported intended sexual behaviour statistically significant differences were found with regard to gender, past sexual experience and exposure to the intervention. This information suggests the way in which adolescent sexuality education needs to be developed and detracts from the notion that the same intervention will be beneficial to all participants. In developing such programmes the differences particularly with regard to gender and sexual experience needs to be addressed. Supportive strategies should be built into the programme to enable learners to carry their intention through, for example female participants who intended not to have sex may benefit from a programme

on sexual assertiveness training, while sexually active male participants who intend to continue having sex may benefit from a programme on contraception and safer sex (Nahom et al, 2001). This is important with regard to the introduction of school sexuality education programmes and confirms that since past sexual experience is such a strong predictor of intention, sexuality education programmes need to be designed for younger children, who have not yet become sexually active, at higher primary school level (Klepp et al, 1996; Stanton et al, 1998).

While Laduma was successful in influencing the learners' intentions to use condoms, it did not influence their current reported sexual practice and reported condom use behaviour. This suggests that interventions aimed at changing behaviour need to be supported by guided practice of actual skills involved in achieving the behaviour. The complexity of seeing safer sex behaviours through to completion requires learners to feel competent and confident that they can perform the required task. This may be achieved through programmes that teach self-regulatory skills. Self-regulatory skills enhance self-efficacy and a feeling of ones' competence to perform a desired action. Self-regulatory skills' development therefore needs to target groups at the level at which they are and for example, teach assertiveness related to abstinence (no, I am not ready for sex) to non-sexually active groups and for condom use (no, I will not have sex without a condom) to sexually active groups. To effect these communication skills requires an ability to engage in a decision making process, a skill which has to be taught to young people in the first place, to enable them to act responsibly in the heat of the moment (Silva, 2002).

Further, the finding that fewer learners in the intervention group intended not to have sex compared to learners in the control group needs to be interpreted taking into account the content of Laduma. The emphasis was more on promoting protective sex as opposed to abstinence. It is therefore possible that the strength of the former message

(condom use) is what learners picked up more readily. This is confirmed in that a higher percentage of learners in the intervention group reported intending to use a condom when next having sex than learners in the control group (Bartholomew et al, 2001).

5.1.5 Learners Impressions of Laduma

Learners' responses to questions about Laduma reflect a favourable response to it as a means of prevention education. It was interesting to note that learners responded unsure rather than agreeing with the lead characters about certain issues. The unsure responses reflect a gap in some crucial information that learners ought to have and calls for sexuality education to address more specific issues as for example some of the mythical thinking about transmission of HIV.

Furthermore an assessment of learners' responses to a set of statements for and against safe sex and condom use made by the lead characters reflect that learners did not necessarily agree with everything the character said but were able to follow through with the argument and appreciate the intentions and objectives of the intervention. This is confirmed by the learners' response to the health seeking question where just over a quarter reported that they will do what Zweli did, that is, seek treatment from a sangoma and the clinic / doctor.

5.2 Evaluation

There was a dearth of literature on the evaluation of the impact of print media, in particular photo-novellas. Much is known about its development and what could be achieved but little evaluative work has been documented on print media. A participatory approach to photo-novella development and implementation is not a commonly used strategy. General media strategies such as pamphlets, television and newspapers have been

widely used and proven important in creating awareness however formal evaluation was once again frequently lacking.

Furthermore in carrying out the literature search it became evident that in situations where interventions have been evaluated the methodology used was questionable. This study attempted to address the limits to an effective evaluation by using a randomised control group study design and collecting pre and post-intervention measures as well as reporting on predetermined outcome measures. The evaluation of Laduma was rigorous and the design of choice accounted for any possible confounding effects.

The findings of this evaluation provide a yardstick as to how Laduma can be used in the future. It is clear that, in as much as reading Laduma provides the reader with basic knowledge and information to prepare them for adopting safer sex behaviours, and there is a need for it to be linked to a facilitated skills development component to ensure the adoption of such behaviours. This discrepancy between unprotected sexual behaviour and improved knowledge and acceptance of condoms, as determined in this study, emphasises the need for an expanded approach to sexuality education (Svenson et al 1997; Salt et al 1990; Harrison et al 2000).

This evaluation of a systematically developed educational photo-novella (Laduma) therefore has served to demonstrate how educational materials can be used to achieve maximum benefit and in addition alerts the programme developer as to what is needed to achieve this. In this study it became clear that Laduma provided valuable preparatory information for adolescents to think about and on which to make their decisions. However any meaningful change in behaviour required a skills development component to the programme, a recommendation that may be possible in the school setting.

5.3 Value and Limitations of Print Media

This study has shown that the use of Laduma as a strategy to influence the preventive behaviours of large numbers of adolescents, as envisaged, has been effective in certain limited though significant respects. Laduma influenced those elements that are considered as prerequisites to behaviour change as evidenced in the increase in learners' understanding of the spread and causes of sexually transmitted infections, a more positive attitude towards condom use and their intentions to use condoms when having sex. However, reading Laduma did not lead to reported behaviour change concerning talking to ones' boyfriend or girlfriend about sexually transmitted infections and HIV/AIDS or to preventive behaviours such as condom use or abstinence.

These findings are of particular significance and bring to light the limitations of the use of print media alone. In Laduma quite a lot of attention was paid to encourage an open discussion about sexually transmitted infections and prevention of these infections, with one's partner and relevant others such as parents, friends or classmates. Talking about these issues with one's partner was seen as one of the first behavioural activities leading to informed decisions about effective preventive behaviours such as consistent use of condoms or abstinence. In developing Laduma it was expected that by openly presenting and discussing sensitive issues as sex, sexually transmitted infections and condom use and developing culturally appropriate dialogue about these issues supported by real life pictures and the use of modelling techniques, talking with significant others would be influenced and enhanced. However, an increase in communication between partners and significant others, after reading Laduma, was not demonstrated in this study. A plausible

explanation for this is that communication like actual behaviour change requires active participation, through for example, exposure to role-play or the opportunity to enact the skills.

This finding confirms that awareness of the problem, positive attitudes towards the desired behaviour and a positive intention to perform the desired behaviour are prerequisites, but not sufficient to realise actual behaviour change (Prewitt, 1989; Petosa & Wessinger, 1990). Deeper issues, for example the taboos, gender inequalities and embarrassment associated with communication about sexual issues cloud open discussion or disclosure to one's sexual partner (Svenson et al, 1997). These barriers to behaviour change require further investigation.

Laduma therefore addressed the knowledge and information aspect of HIV prevention with success and its use therefore needs to be specifically targeted to increase knowledge, improve attitudes towards people living with AIDS and intention to use condoms or abstain (Romer & Hornik, 1992).

The value of Laduma lies in the fact that it may be used to prepare learners by enhancing their knowledge as well as influencing their attitudes, prior to the implementation of a comprehensive programme with minimal intervention from health workers and teachers. This is possible in schools where the life skills programme focussing on HIV and AIDS is being implemented. Reading Laduma prior to the lessons will prepare the learners adequately and permit the teacher to carry on with more intensive lessons that are skills based. Further Laduma has the added advantage of being able to be used independently by large numbers of adolescents where other programmes are not in place.

As stated earlier this intervention addressed the proximal determinants. The more distal determinants including culture, social and gender norms that influence condom use

were not specifically investigated in this study. The recommended behaviour though was acceptable to the adolescents involved in the development of the photo-novella.

CHAPTER 6

Chapter 6: Recommendations and Conclusions

To increase learners' perceptions of personal vulnerability
To improve knowledge about sexually transmitted infections
To increase skills for safer sex behaviour
Conclusions

The results of this study highlight the aspects of sexuality education that needs to be reinforced as well as those aspects that need to be targeted to move adolescents from awareness to practising safer sexual behaviours. Participants in this study were found to have a sound understanding of critical information about sexually transmitted infections in terms of knowledge specifically related to causes and spread. However, they were markedly at a disadvantage when it came to more specific, concrete information related to protection and treatment.

This could possibly reflect the limitations of campaign driven education, and is indicative of the fact that sexuality education in South Africa needs to move beyond awareness and information dissemination to more intensive and focussed programmes that lead to behaviour change (Harrison et al, 2000).

This study has established some of the critical issues that need to be addressed within the framework of a combination of theoretical principles to effect change and adoption of safer behavioural practices. Among these issues are those related to personal vulnerability, gender differences, gaps between knowledge and practice, as well as attitudes to condom use and people living with HIV and AIDS. These crucial elements need to be incorporated in health education programmes to effect change in sexual behaviour.

Central to the inclusion of such information in educational programmes is an understanding of how to address the topics in the context of the target group in a manner

that makes a difference to sexuality education in South Africa. Teachers have the potential to play a crucial part in sexuality education as a result of the large numbers of adolescents at schools. Training of teachers to enhance their skills to facilitate education that aims to address sexual behaviour change will assist in effective implementation of the educational programmes.

6.1 Recommendations

The recommendations for the development and implementation of programmes that impact on sexual behaviour change is therefore made at two levels; the level of the learners and what they need to know as well as at the level of the teachers and what they need to include in health education to promote effective sexuality education.

6.1.1. Learners

- This study recommends that sexuality education needs to increase learners' perception of vulnerability to becoming infected with a sexually transmitted infection including HIV and AIDS.
- The findings show that learners had lower levels of knowledge regarding the treatment of and the protection against sexually transmitted infections compared to knowledge about the causes and the spread. This apparent gap needs to be addressed in education programmes to ensure that effective preventive behaviour will be influenced and adopted.
- Sexuality educational programmes need to have an objective that specifically aims to improve learners' skills to increase safe sexual behaviour. This may be delaying the onset of sexual activity and, or, increasing the use of condoms on every sexual encounter.

6.1.2 Teachers

- The study shows that teachers need to develop programmes that increase learners' vulnerability to sexually transmitted infections including HIV and AIDS. This may be done through increasing teachers' theoretical knowledge about behaviour change and specifically the role of perceptions of personal vulnerability in adopting safer behaviours.
- The findings reflect that teachers need to develop programmes that address more than the cause and spread of sexually transmitted infections. Educational programmes need to include substantial information on the treatment of, and protection against sexually transmitted infections in order to influence informed decision making about sexual choices.
- The finding that actual behaviour did not change after a single reading of Laduma indicates that teachers need to facilitate programmes that in addition teach skills to promote safer sex.

In making these recommendations the following have been taken into account:

- Recent reviews of the literature on the effectiveness of HIV/AIDS education programmes for school adolescents and adolescents in developing countries and in Southern Africa confirm that programmes which showed success in terms of adoption of safer sexual behaviours frequently included a strong skills' development component (Van Empelen et al, 2001).
- Learners need to be aware of what the actual behaviour entails and be provided with the opportunity to strengthen their skills in a less threatening environment. Observing others, preferably peers, modelling desired behaviours prepare the learner for performance (Curtis, 1992).

- Effective programmes also seem to have appropriately trained educators who have time available and the necessary skills to implement the programmes (Kirby, 1997).
- As skills can most effectively be learnt through observation, demonstration and practice, the classroom provides a safe environment for such guided practice to take place.
- Teachers need to be trained in strategies like enactive mastery learning, coping modelling, mastery modelling, instructive modelling, and guided skill perfection to facilitate this kind of skills development amongst learners (Bandura, 1997).
- Teachers also need to be knowledgeable and able to address a range of issues related to sexual behaviour of adolescents through educational programmes that are available to adolescents in a user friendly and comprehensive manner (Rafferty & Radosh, 1997).

6.2 Conclusion

Print media, such as a systematically developed photo-novella as Laduma, through this evaluation has been shown to be an effective educational tool in a specific context. This evaluation assessed whether Laduma achieved the impact it was designed for, namely to appeal to and hold the interest of learners, to convey health messages to large numbers of adolescents in a captivating way that increased their knowledge, created positive attitudes towards specific preventive behaviours (condom use in this study), and enhanced intention to perform such behaviour. However, it must be noted that this type of pedagogic intervention was not successful in developing communication skills. More research needs to be undertaken on methodologies that will promote dialogue about these sensitive topics

between friends, sexual partners and parents. Strategies that focus on training of (self-regulatory) skills needed to perform the required behaviours are required since a study conducted by Hocking, Turk & Ellinger (1999) confirmed that effective communication on sexual issues results in a greater likelihood that condoms will be used.

Bibliography

Agha, S. 2002. An assessment of the Impact of Four Adolescent Sexual Health interventions in Sub-Saharan Africa. *International Family Planning Perspectives*, Vol 28, No 2, 67-70, 113-118.

Ajzen, I. & Fishbein, M. 1980. *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice-Hall.

Bandura, A. 2000. Health Promotion from the Perspective of Social Cognitive Theory. In *Understanding and Changing Health Behaviour from Health Beliefs to Self-Regulation* ed. Norman, P., Abraham, C., & Conner, M. Harwood Academic Publishers.

Bandura, A. 1962. Social Learning through imitation. In: Jones MR, ed. *Nebraska Symposium on Motivation* Vol 10. Lincoln: University of Nebraska Press.

Bandura, A. 1997. *Self-efficacy: The exercise of control*. New York: Freeman.

Bartholomew L. K., Parcel G., Kok G. & Gottlieb N. H. 2001. *Intervention Mapping, Designing Theory and Evidence – Based Health Promotion Programs*. Chapter 10 A School AIDS Prevention Program in the Netherlands, 353-386. McGraw-Hill Higher Education.

Basen-Engquist, K. & Parcel, G.S. 1992. Attitudes, Norms and Self – Efficacy: A Model of Adolescents' HIV – Related Sexual Risk Behaviour. *Health Education Quarterly*, 19 (2), 263-277.

Blecher, M.S., Steinberg, M., Pick, W., Hennick, M. & Durcan, N. 1995. AIDS – knowledge, attitudes and practices among STD clinic attendees in the Cape Peninsula. *South African Medical Journal*, 85 (12), 1281-1286.

Breakwell, G.M., Hammond, S & Fife-Shaw, C. 1995. *Research Methods In Psychology*. Sage Publications London.

Chapman, S., Stoker, L., Ward, M., Porrit, D. & Fahey, P. 1990. Discriminant attitudes and beliefs about condoms in young, multi-partner heterosexuals. *International Journal of STDs and AIDS*, 1, 422-428.

Colvin, M. 2000. Sexually transmitted infections in Southern Africa: A public health crisis. *South African Journal of Science*, 96, 335-342.

Comings, J.P., Frantz, S.C. & Cain, B.J. 1981. Community participation in the development of environmental health education materials. *Convergence*, 14, 36-44.

Cork, M. 1990. Approaches to Health Promotion. *Midwife Health Visitor & Community Nurse*, Vol. 26, No. 5, 169-173.

Coyle, S.L., Boruch, R.F. & Turner, C.F. (eds.) 1991. Evaluating AIDS Prevention Programmes. Washington, D.C. National Academy Press.

Curtis, S. 1992. Promoting Health Through a Developmental Analysis of Adolescent Risk Behaviour. *Journal of School Health*, 62 (9), 417 – 420.

Department of Health, South Africa 2000. National HIV Sero-Prevalence Survey of Women Attending Public Antenatal Clinics in South Africa 1999. Directorate: Health Systems Research & Epidemiology.

Department of Health, 2000. Draft National Integrated Plan for children Infected and Affected by HIV / AIDS.

DiClemente, R. J. (ed) 1992 Psychosocial determinants of condom use among adolescents. In: *Adolescents and AIDS: A generation in jeopardy*. CA: Beverley Hills: Sage.

Eaton, L., Flisher, A.J. & Aaro, L.E. 2003. Unsafe sexual behaviour in South African adolescents. *Social Science & Medicine*, 56, 149 – 165.

The Education Foundation Atlas of South Africa 2000. Prepared by Monica Bot, Sandy Dove and Daniel Wilson. An Education Foundation Publication.

Egger, G., Donavan, R., & Spark, R. 1993. Health and the Media. Principles and Practices for Health promotion. McGraw-Hill Book Company Publishers, Sydney. [Online] Available http://fcis.oise.utoronto.ca/~daniel_schugurensky/assignment1/1924ymca.html, accessed 23rd June 2005.

Everett, K & Schaay, N. 1994. Country Watch: South Africa. AIDS health promotion exchange, 7-8.

Fishbein, M. & Ajzen, I. 1975. Belief, attitude, intention and behaviour. Boston: Addison-Wesley.

Fishbein, M., Bandura, A., Triandis, H. C., Kanfer, F. H., Becker, M. H. & Middlestadt, S. E. 1991. Factors influencing behaviour and behaviour change. Final report to the Theorist's Workshop, Washington, DC.

Glanz, K. & Rimer, B. K. 1995. Theory at a Glance. A Guide for Health Promotion Practice. National Institute of Health.

Goldstein, S., Usdin, S., Scheepers, E., Anderson, A., Garth, J. 2002. The treatment of AIDS in "Soul BuddyZ": A Multimedia Campaign for Children's Health in South Africa. Soul City Institute for health and Development Communication. [Online]<http://www.soulcity.org.za/>.

Government Gazette, August 1999. National Education Policy Act, 1996 (NO. 27 of 1996).

Green, L.W. & Lewis, F.M 1986. Measurement and Evaluation In Health Education And Health Promotion. Mayfield Publishing Company, California.

Harrison, A., Smit, J. A. & Myer, L. 2000. Prevention of HIV / AIDS in South Africa: a review of behaviour change interventions, evidence and options for the future. South African Journal of Science 96, 285-290.

Harrison, A. 2002. The social dynamics of adolescent risk for HIV: using research findings to design a school-based intervention. Agenda 53, 43-52.

Hocking, J.E., Turk, D. & Ellinger, A. 1999. The effects of partner insistence of condom usage on perceptions of the partner, the relationship, and the experience. Journal of Adolescence, 22, 355-367.

Hubley, J. 1995. Communicating Health. An action guide to health education and health promotion. Macmillan Education LTD. London and Basingstoke.

James, S., Reddy, P., Taylor, M. & Jinabhai, C.C. 2004. Adolescents, HIV / AIDS / STIs and sexuality in South Africa: Gaps between awareness and behaviour. *Acta Paediatrica*, 93(2): 264-269.

Jemmott III, J.B., Jemmott, L.S. & Fong, G.T. 1992. Reductions in HIV Risk-Associated sexual Behaviours among Black Male Adolescents: Effects of an AIDS Prevention Intervention. *American Journal of Public Health*, Vol. 82, No3, 372-377.

Jemmott III, J.B., & Jemmott, L.S. 2000. HIV risk reduction behavioural interventions with heterosexual adolescents. *AIDS*, 14 (suppl 2), S40-S52.

Jewkes, R.K., Levin, J.B & Penn-Kekana, I.A. 2003. Gender inequalities, intimate partner violence and HIV preventive practices: findings of a South African cross- sectional study. *Social Science & Medicine*, 56, 125 – 134.

Kickbusch, I. 1995. Health promotion: the way forward. *Health Promotion International*, Vol 10, No1, 1-3.

Kirby, D. 1997. *No Easy Answers*. Washington, D.C.: The National Campaign to Prevent Teen Pregnancy.

Klepp, K. I., Ndeki, S.S., Thuen, F., Leshabari, M. & Seha, A.M. 1996. Predicators of intention to be sexually active among Tanzanian school children. *East African Medical Journal*, April, 218-224.

Kok, G. 1992. Health Education Theories and Research for AIDS Prevention. *Hygie* 1992, 10, 32 – 39.

Kok, G., Schaalma, H., De Vries, H., Parcel, G. & Paulussen, T. 1996. Social psychology and health education. In W. Stroebe & M. Newstone (Eds.), *European Review of Social Psychology*, 7, 241-282. New York: Wiley.

Kuhn, L., Steinberg, M. & Mathews, C. 1994. Participation of the school community in AIDS education: an evaluation of a high school programme in South Africa. *Aids Care*, Vol. 6, No. 2, 161-171.

Lancet, 2001. The CONSORT statement: Revised recommendations for improving the quality of reports of parallel-group randomised trials. Vol 357, Number 9263.

Leclerc-Madlala, S. 1997. Infect one, infect all: Zulu adolescents response to the AIDS epidemic in South Africa. *Medical Anthropology*, 17, 139-151.

MacPhail, C. & Campbell, C. 1999. Evaluating HIV/STD interventions in developing countries: do current indicators do justice to advances in intervention approaches? *South African Journal of Psychology*, 29(4), 149-165.

MacPhail, C. & Campbell, C. 2001. 'I think condoms are good but, aai, I hate those things': condom use among adolescents and adolescents in a Southern African township. *Social Science & Medicine* 52, 1613-1627.

Maman, S., Campbell, J., Sweat, M.D. & Gielen, A.C. 2000. The intersection of HIV and violence: Directions for future research and interventions. *Social Science and Medicine*, 50, 459-478.

Merson, M.H., Dayton, J.M. & O'Reilly, K. 2000. Effectiveness of HIV prevention interventions in developing countries. *AIDS*, 14 (suppl 2), S68-S84.

Moatti, J.P., Dab, W., Loundou, H., Quenel, P., Beltzer, N., Anes, A., Pollak, M. 1992. Impact on the general public of media campaigns against AIDS: a French evaluation. *Health policy*, July; 21 (3), 233-247.

Myhre, S.L. & Flora, J. A. 2000. HIV/AIDS Communication Campaigns; Progress and Prospects. *Journal of Health Communication*; June 2000 Supplement, Vol. 5 Issue 3, 29, 17p.

Nahom, D., Wells, E., Gillmore, M.R., Hoppe, M., Morrison, D.M., Archibald, M., Murowchick, E., Wilsdon, A. & Graham, L. 2001. Differences by Gender and Sexual

Experience in Adolescent Sexual Behavior: Implications for Education and HIV Prevention. *Journal of School Health*, Vol 71, No. 4, 153 – 157.

Oakley, A., Fullerton, D. & Holland, J. 1995. Behavioural interventions for HIV / AIDS prevention. *AIDS*, 9, 479-486.

Oppenheim, L., Brawer, R., & Plumb, J. 2004. Creating a culturally sensitive breast health photonovella with Chinese women. [Online] Available

http://apha.confex.com/apha/132am/techprogram/paper_79877.htm,
accessed 25th June 2005.

Owen, N. & Lee, C. 1986. Towards More Rigorous Evaluation of Health Promotion Programmes. *Australian Psychologist*, Vol. 21, No. 1, 79-91.

Petosa, R. & Wessinger, J. 1990. AIDS education needs of adolescents: A theory – based approach. *AIDS Education and Prevention*, 2, 126 – 136.

Pequegnat, W. & Stover, E. 2000. Behavioral prevention is today's AIDS vaccine! *Aids* 2000, 14 (suppl 2), S1-S7.

Prewitt, V.R. 1989. Health beliefs and AIDS educational materials. *Family Community Health*, 12, 65 – 76.

Rafferty, Y. & Radosh, A. 1997. Attitudes About AIDS Education And Condom Availability Among Parents Of High School Students in New York City: A Focus Group Approach. *AIDS Education and Prevention*, 9(1), 14 – 30.

Reddy, M.V. 2002. Statistics For Mental Health Care Research. NIMHANS Publication No. 46.

Reddy, P., Kok, G., Van den Borne, B. & Yach, D. 1995. Unravelling health promotion: in pursuit of more successful interventions. *CHASA Journal of Comprehensive Health*, 6(3), 110-114.

Reddy, P., Meyer – Weitz, A., Van den Borne, B. & Kok, G. 1999. Developing health education interventions targeted at STD clinic attenders. *MRC Policy Brief No 1*, July.

Reddy, P., Meyer-Weitz, A., Van den Borne, B. & Kok, G. 2000. Determinants of Condom-use behaviour among STD clinic attenders in South Africa. *International Journal of STD & AIDS*, 11, 521-530.

Reddy, S., Mathews, C. & Lombard, C. 1994. An evaluation of an AIDS education photocomic developed for South African adolescents. Unpublished manuscript.

Redman, S., Spencer E. A. & Swanson – Fisher R. W. 1990. The role of mass media in changing health-related behaviour: a critical appraisal of two models. *Health Promotion International*, Vol.5, No1, 85-99.

Reinecke, J., Schmidt, P. & Ajzen, I. 1996. Application of the Theory of Planned Behaviour to Adolescents' Condom Use: A Panel Study. *Journal of Applied Social Psychology*, 26 (9), 749-772.

Richard, R. & Van der Plight, J. 1991. Factors affecting condom use among adolescents. *Journal of Community and Applied Social Psychology*, 1, 105-116.

Rogers, E.M. 2000. Introduction. *Journal of Health Communication*, Vol. 5 (Supplement), 1-3.

Romer, D. & Hornik, R. C. 1992. Using Mass Media for Prevention of HIV Infection Among Adolescents. In: *Adolescents and AIDS: A generation in jeopardy*. CA: Beverley Hills: Sage:

Rosenstock, I. M. & Kirscht, J. P. 1974. "The Health Belief Model and Personal Health Behaviour". *Health Education Monographs*, 2, 470-473.

Roter, D.L., Rudd, R.E., Frantz, S.C. & Comings, J.P. 1981. Community-produced materials for health education. *Public Health Report*, 2, 169-172.

Salt, H., Boyle, M., & Ives, J. 1990. HIV prevention: current health promoting behaviour models for understanding psycho-social determinants of condom use. *AIDS Care*, Vol. 2, No.1, 69-75.

Schaalma, H. P. 1995. Planned development and evaluation of school – based AIDS / STD education. Maastricht (PhD. thesis).

Schugurensky, D. (no date). In a pioneering effort, radio station KYW in collaboration with the YMCA broadcasts health education program.

[Online] Available http://fcis.oise.utoronto.ca/~daniel_schugurensky/assignment/1924ymca.html, accessed 23rd June 2005.

Silva, M. 2002. The effectiveness of school-based sex education programmes in the promotion of abstinent behaviour: a meta-analysis. *Health Education Research Theory & Practice*, Vol 17 No 4, 471-481.

Singhal, A., & Rogers, E.M (2001). The entertainment-education strategy in communication campaigns. In R.E. Rice & C. Atkin (Eds), *Public communication campaigns*. Third Edition. Thousand Oaks: CA, Sage, 343-356.

Singhal, S., Usdin, S., Scheepers, E., Goldstein, S., Japhet, G., (2002). *Harnessing the Entertainment-Education Strategy in Africa: The Soul City Intervention in South Africa*. A chapter in Charles Okigbo (Ed). (in preparation) *Development and Communication in Africa*. Rowman and Littlefield Publishers. [Online] <<http://www.soulcity.org.za/>>.

Snyder, L.B., & Rouse, R.A. 1995. The Media Can Have More Than an Impersonal Impact: The Case of AIDS Risk Perceptions and Behavior. *Health Communication*, 7(2), 125-145.

Stanton, B., Li, X., Kahihuata, J., Neumbo, S., Kanduuombe, G., Ricardo, I.B., Galbraith, J.S., Terreri, N., Guevara, I., Shipena, H., Strijdom, J., Clemens, R. & Zimba R.F. 1998. Increased protected sex and abstinence among Nambian adolescents following a HIV risk-reduction intervention: a randomised, longitudinal study. *AIDS*, 12, 2473-2480.

Svenson, L.W., Carmel, S. & Varnhagen, C.K. 1997. A review of the knowledge, attitudes and behaviours of university students concerning HIV/AIDS. *Health Promotion International*, Vol 12, No. 1, 61-68.

Tabaschnick, B.G. & Fidell, L.S. 1996. *Using Multivariate Statistics*. Third Edition. Harper Collins College Publishers.

Toroyan, T. & Reddy, P.S. 1997. Participation of South African adolescents in the design and development of AIDS photo comics. *International Quarterly of Community Health Education*, 17 (2), 131-146.

UNAIDS, 2000. Report on the global HIV / AIDS epidemic June 2000. Geneva, Switzerland: Joint United Nations Programme on HIV / AIDS.

Van Empelen, P., Kok, G., Van Kesteren, N.M.C., Van den Borne, B., Bos, A.E.R., Dijker, A.J., Hospers, H.J., Schaalma, H.P. & Hogeweg, J.A. 2001. Effectiveness of psychological HIV prevention programmes: A review. Department of Experimental Psychology, Maastricht University.

Varga, C. & Shongwe, B. 1999. School Based Reproductive Health Education. Durban: Health Systems Trust.

Weinstein, N.D. 1984. Why It Won't Happen to Me: Perceptions of Risk Factors and Susceptibility. *Health Psychology*, 3 (5), 431-457.

Williams, B. G., Gouws, E. & Abdool Karim, S. S. 2000. Where are we now? Where are we going? The demographic impact of HIV / AIDS in South Africa. *South African Journal of Science* 96, 297-300.

Wingood, G.M. & Diclemente, R.J. 1998. The effects of an abusive primary partner on the condom use and sexual negotiation practices of African-American women. *American Journal of Public Health*, 87 (6), 1016-1018.

Wright, G. & Sherman, R. 1999. Lets create a comic strip. *Reading Improvement*, 36, 66-72.

Wren, A.P., Janz, K.N., Carovano, K. 1997. Preventing the Spread of AIDS in Adolescents: Principles of Practice From 11 Diverse Projects. *Journal of Adolescent Health*, 21, 309-317.

Yoder, P.S., Hornik, R., Chirwa, E.C. 1996. Evaluating the program effects of a radio drama about AIDS in Zambia. *Studies in family planning*. Jul-Aug; 27 (4), 188-203.