

**THE IMPORTANCE OF STI TREATMENT IN HIV PREVENTION:
KNOWLEDGE AND BEHAVIOURS OF SECONDARY
SCHOOL STUDENTS IN TSUMEB, NAMIBIA**

A mini-thesis submitted in partial fulfilment of the degree, Master in Public Health
(MPH)



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Date: 25 November 2005

Cross-sectional KAP study, urban senior secondary school students, STIs, HIV, risk behaviours, health seeking behaviours, STI control, sexual HIV transmission, Tsumeb, Namibia.

DECLARATION

I declare that “The importance of STI treatment in HIV prevention: knowledge and behaviours of secondary school students in Tsumeb, Namibia” is my own independent work, that it has not been submitted before for any degree or examination in any other university, and that all the sources I have used or quoted have been indicated and acknowledged as complete references.

Barbara Matengu

November 2005



ACKNOWLEDGEMENTS

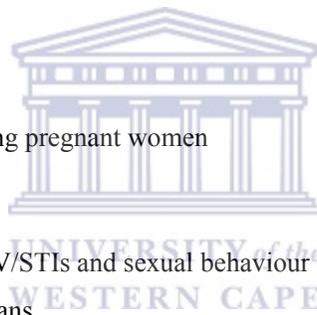
This study would not have been possible without the immense patience and never-ending support of my family all through the generations. Our small children Saniah and Maseli kept on boosting my energy with their sunny natures, my husband Castro managed almost magically to balance all stress and create a conducive atmosphere, and my parents travelled half around the world to come and assist at all ends. Thank you all so much and apologies for the stress I brought on all of us.

In a similar tone, I highly appreciate the assistance and directives I received from my supervisors Dr. H. Hausler and Ms. E. Batiste. Thank you very much for the chance to benefit from your experience and for all the time you shared out for my project despite tight schedules.

I also express my sincere gratitude to the principals and teachers of the participating schools in Tsumeb and Grootfontein for their assistance. Special thanks goes to the students who made this study a success with their open and honest answers. Please accept my apologies for any interruptions of school routines.

Last but not least, I thank all those I could not mention by name because of time and limited space. Please accept my sincere gratitude.

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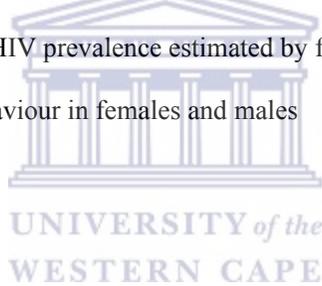


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LIST OF ACRONYMS

ABC approach	Abstinence, be safe/faithful, consistent and correct condom use
AIDS	Acquired Immune Deficiency Syndrome
CDC	Centers for Disease Control and Prevention
FHI	Family Health International
HAART	Highly active anti-retroviral therapy
HIS	Health Information System
HIV	Human Immunodeficiency Virus
KAP	Knowledge, Attitude, Practice
MOHSS	Ministry of Health and Social Services, Namibia
MPH	Master in Public Health
NEMLIST	Namibia Essential Medicine List
PMTCT	Prevention of mother-to-child transmission
STD	Sexually Transmitted Disease
STI	Sexually Transmitted Infection
UNAIDS	Joint United Nations Programme on AIDS
UNICEF	United Nations International Children's Fund
WHO	World Health Organisation

ABSTRACT

Study aim: To assess knowledge regarding HIV and STIs, risk behaviours and health seeking behaviours among grade 12 students in Tsumeb, Namibia.

Study design: Cross-sectional KAP survey.

Sample population: All Tsumeb public senior secondary schools' grade 12 students present at the time of the study were registered. The sample consisted of 233 participants.

Data collection tool: A self-administered standardized questionnaire was used for data collection. It was piloted prior to the actual data collection to ensure validity and comprehensibility.

Data analysis: Epi Info 2002 was used to estimate relative frequencies and 95% confidence intervals as well as to produce statistics, graphs, and tables.

Results: Answers show large consistency between schools, which points to a high validity of data. Almost all students had received education on HIV and other STIs at school and outcomes revealed good general knowledge on HIV/STIs. However, 14.2% believed that STIs are not curable and only 19.8% knew that STI treatment could reduce HIV transmission. Almost all students (97%) stated that they would seek STI treatment if necessary. Two thirds (64.4%) expressed mistrust in health workers though, which might keep them from actually accessing treatment. 73.9% of boys and 38.4% of girls reported sexual activity. Mean age at initiation was significantly lower in males compared to females (14.6 vs. 16.7 years). No girl but 29.7% of boys indicated sexual debut prior to 14 years, many even prior to 12 years. Consistent condom use was reported by more than half (54.8%) of the sexually active students. 73.0% indicated condom use during last sexual intercourse (80.5% of boys and 54.5% of girls).

Conclusions: Curricula should be strengthened by teaching the curability of STIs and the importance of STI treatment to prevent HIV transmission. Special attention should be given to sex education of young boys aged 9-11 years to prevent unsafe sexual behaviour of boys prior to 12 years of age. Young people need to be informed that health workers are bound professionally to confidentiality. Health workers should be trained on the importance of confidentiality and disciplinary action needs to be taken when confidentiality is breached.



A. INTRODUCTION

1. Background

Sub-Saharan Africa remains the region worst affected by the HIV epidemic. At the end of 2004, it was home to almost two thirds (25.4 million) of the estimated 39.4 million people living with HIV worldwide [1]. Reports that HIV prevalence has stabilised throughout the region in recent years gives the impression of a slowing epidemic. But it might rather disguise the worst phase of the epidemic, with roughly equally large numbers of people being newly infected with HIV and dying of AIDS. Only a clear decline in the number of new infections would allow the situation to improve. Instead, the HIV/AIDS incidence is still on the increase in Sub-Saharan Africa where 3.1 million people were newly infected in 2004 compared to 2.9 million in 2002 [1].

Sexual risk reduction reduces HIV transmission. HIV is preventable. This prevention is usually promoted through a combination of strategies referred to as “ABC”, which stands for abstinence, being faithful and condom use [2]. But for many women and girls, particularly in developing countries, the ABC approach is of limited value due to their lack of social and economic power that does not allow them to negotiate abstinence or their partners’ faithfulness and use of condoms. It will take time, if ever, for the ABC approach to be widely accepted and followed. This is so because not only single individuals but whole societies, traditions, habits, and taboos are challenged to facilitate the necessary changes in sexual behaviour. In the meantime, more needs to be done to reduce the spread of HIV.

This study focuses on the control of sexually transmitted infections (STIs) as a key HIV prevention strategy. STIs act as a strong cofactor in the sexual transmission of HIV. Effective STI management can limit the spread of HIV [3].

2. Justification of the study

Whilst serving as a strong cofactor in the sexual transmission of HIV, many STIs, unlike HIV, are curable with the necessary treatment being widely available and generally easily accessible. This study aims to assess knowledge and STI health seeking behaviours among young people while putting emphasis on the importance of STI control for HIV prevention. It focuses on potential risk reduction for individuals who do engage in high risk sexual behaviours. Results from the study will be used to make recommendations on STI education and interventions to improve STI health seeking behaviours.

3. HIV and STIs in Namibia

3.1. HIV Prevalence among pregnant women

In Namibia, HIV sentinel surveys among pregnant women attending antenatal care (ANC) services have been conducted every two years since 1992. Since Tsumeb was included as sentinel site only in 2002, no earlier data is available for this area [4]. The national HIV prevalence among antenatal women increased from 4.2% in 1992 to 23.3% in 2002 with a maximum of 43% at one sentinel site in that year. Particularly alarming is the increasing HIV prevalence among young antenatal women, which rose from 6 to 11% amongst teenagers, aged 15 to 19 years, and from 11 to 22% amongst those, aged 20 to 24 years between 1994 and 2002 [4]. Recently released results of the 2004 national HIV

sentinel survey amongst pregnant women [5], however, show the first decline in HIV prevalence since the beginning of HIV surveillance in Namibia. This applies for both the overall prevalence, which dropped from 22.0 to 19.7% between 2002 and 2004, as well as for most of the age groups independently. Amongst the youngest (15-19 years) it levelled from 11 to 10% and in the subsequent age group (20-24 years) more notably from 22 to 18%. Confidence intervals on these values are not available so it is not clear if these changes are statistically significant. Site-specific HIV prevalence is reported for two age groups, namely women aged 25 years and above and those below 25 years. In Tsumeb, HIV prevalence dropped from 33.0 to 25.8% for the elder age group and from 15.4 to 6.3% for those under 25 years of age between 2002 and 2004. These reductions clearly exceed average trends in the country, which showed a decrease from 25.6 to 23.9% for the elder age group and from 17.9 to 15.2% for the younger ones.

3.2. Reported STI cases

According to data from the Health Information System (HIS) [6], a total of 88,971 STI cases (genital ulcer, pelvic inflammatory disease, urethral and vaginal discharge, other STIs) were reported from first visits at outpatient departments of all public health facilities in Namibia (Tsumeb: 1,237 cases) during the financial year 2004/2005. While this only accounts for about 4% of all first visits, true incidence may be much higher with an unknown number of cases remaining undetected.

3.3. Knowledge about HIV/STIs and sexual behaviour among young Namibians

In 2004, investigations among young Namibian people aged 15-24 years showed that only 31% of women and 41% of men had a satisfying knowledge of HIV prevention

methods. The indicator for this estimation was defined by both correctly identifying two ways of preventing the sexual transmission of HIV and rejecting three misconceptions about HIV transmission. In the same age group, only 40% of women and 69% of men reported condom use at last higher risk sex (defined as “sex with non-regular partner”) while 80% of females and 85% of males reported non-regular sexual partnerships [7].

The Namibian Demographic and Health Survey for the year 2000 [8] asked participants if “they had heard about infections other than AIDS that can be transmitted sexually”. Among respondents, 31% of women and 19.7% of men did not answer affirmatively with teenagers aged 15-19 years having been the least knowledgeable (45.7% of females and 36.1% of males). The fact that knowledge was generally higher among men was explained by the asymptomatic occurrence of many STIs in women.

3.4. Access to treatment

STI treatment is provided at all public health facilities and outreach points in Namibia to reduce access distances to a minimum. Fees to be paid correspond with the lowest category for clinic visits and cover all aspects of patient management. Thus, STI treatment is generally easily accessible. The management of STIs follows a syndromic approach and treatment schemes are tailored to support treatment adherence by using one-dose medications wherever possible [9]. Since 2003, antiretroviral drugs for the treatment of HIV/AIDS are listed in the Namibian Essential Medicine List [10] and available for the prevention of mother-to-child transmission (PMTCT) and highly active anti-retroviral therapy (HAART) programmes, which have been introduced nationwide in Namibian state hospitals.

B. LITERATURE REVIEW

1. Sexually Transmitted Infections (STIs)

Sexually transmitted infections (STIs) are infections spread by the transfer of organisms from person to person during sexual contact [11]. They can lead to serious complications such as cervical cancer, chronic pelvic pain or ectopic pregnancy in females as well as infertility in both women and men. In addition, untreated STIs in mothers are important causes of infant morbidity and mortality including the risk of blindness from neonatal gonococcal conjunctivitis or complications and possible death from congenital syphilis. Consequences of untreated syphilis might also be fatal in adults [12]. More than 20 micro-organisms and syndromes are known to belong to the category of STIs. They can be grouped using various criteria. There are the classical or traditional STIs like gonorrhoea and syphilis (the latter having killed millions of people since late 15th century in Europe [13]) compared to the newer ones including HIV infection. STIs can also be categorised by pathogens that cause them and which are the targets of medical treatment. There are bacterial STIs including gonorrhoea, syphilis, chancroid and chlamydial infection and viral STIs such as HIV/AIDS, genital herpes, genital warts and Hepatitis B [12]. Treatment outcomes differ according to the causative organism: Whilst bacterial STIs are curable [14], viral infections cannot be cured. Antiretroviral drugs used in the treatment of AIDS slow viral proliferation but do not eradicate HIV from the body. STIs might also be distinguished as to whether or not they cause ulcerations and lesions. This is particularly important with regard to the role that other STIs are playing in the spread of HIV. Syphilis, Herpes and Chancroid are ulcerative STIs, while Gonorrhoea and Chlamydia do not cause such symptoms [15].

2. The link between HIV and other STIs

In their epidemiological fact sheet on HIV/AIDS and STIs, WHO, UNICEF and UNAIDS state that “The predominant mode of transmission of both HIV and other STIs is sexual intercourse” [7]. Consequently, “measures for preventing sexual transmission of HIV and STIs are the same as are the target audiences for interventions”. But apart from common behaviours, there is also a link by biological mechanisms, through which STIs facilitate sexual HIV transmission by increasing both HIV infectiousness and HIV susceptibility. The US Centers for Disease Control and Prevention (CDC) refer to two mechanisms that explain the increased susceptibility to acquire HIV for individuals who are infected with an STI [3]. Firstly, breaks in the genital tract lining or skin that are caused by ulcerative STIs can provide easy entry for HIV. Secondly, the presence of STIs can stimulate an immune response in the genital area, which causes CD4+ cell concentrations to increase in genital secretions that can serve as targets for HIV. Increased infectiousness is explained by a higher concentration of HIV in genital secretions (e.g. semen) of individuals who are co-infected with another STI. “The median concentration of HIV in semen is as much as ten times higher in men who are infected with both gonorrhoea and HIV than in men infected with HIV only” [3]. This makes them more likely to transmit HIV through sexual contact than HIV-infected persons without co-infection.

In another paper, CDC provides some estimates illustrating the strength of the cofactor effect of STIs in the sexual transmission of HIV [16]. These estimates are:

- a. Ulcerative STIs may increase the risk of HIV transmission per sexual exposure 10-50 times for male-to-female transmission and 50-300 times for female-to-male exposure.

- b. Non-ulcerative STIs might increase HIV transmission by two-fold to five-fold.
- c. Treatment of gonorrhoea in HIV-infected men reduces the prevalence of HIV shedding in urethral secretions by approximately 50%.

3. Sexual behaviour

Safe sexual behaviour is the key component in the protection against STIs including HIV. Much has been written and said about sexual behaviour, particularly of adolescents and young adults.

John Tripp and Russell Viner point out that teenagers assess and evaluate risk differently from adults and health professionals [17]. They describe risk-taking behaviours as very common at the start of sexual intimacy and often linked with other health risk behaviours, such as substance misuse. “Having sex for the first time at an early age is often associated with unsafe sex, in part through lack of knowledge, lack of access to contraception, lack of skills and self-efficacy to negotiate contraception, having sex while drunk or stoned and inadequate self-efficacy to resist pressure”. While encouraging health promotion behavioural programmes using peer educators of a similar age, the authors do not support abstinence campaigns. They consider them to be neither effective nor acceptable by teenagers or professionals as they limit young people’s rights and autonomy. Whilst such programmes may delay young people’s first sexual intercourse they may also increase their risk of having unprotected sex when they do begin having sex.

Abstinence only programmes are also strongly opposed by Janice Hopkins Tanne. She

refers to a study that was conducted at 29 schools in Texas (USA) by B. Pruitt et al of the Texas A&M University. They state that abstinence only programmes have been carried out in Texas over years with no or even negative impact on adolescents' sexual behaviour. Weaknesses of such programmes are seen in lacking sex education and limited information about contraception, which only focus on failure rates [18].

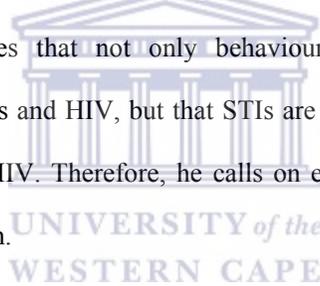
Kaaya et al [19] did a literature review on sexual behaviour and knowledge about HIV/STI of secondary school students aged 14 to 24 years for the years 1987 through 1999. They found 47 articles focussing on students aged 14 to 24 years. Consistently, rates of sexual intercourse were high and use of condoms infrequent. The authors concluded that more data are needed.

In 2002, the "1st South African National Youth Risk Behaviour Survey" was carried out nationwide in South Africa with more than 10,000 grade 8-11 learners (ages ranging from "13 years or under" up to "19 years or over") from about 200 schools participating [20]. The survey focused on the ages of sexual debut, the number of partners, the use of alcohol and drugs before sex, contraception, pregnancy and abortion, condom use, experience with STIs and knowledge about HIV. Regarding behaviours related to sexuality, heightened sexual awareness is described as part of adolescent development that is often characterised by experimentation, which has the potential of placing adolescents at risk of unprotected sexual activity, unplanned pregnancy, and STIs including HIV. One of the important outcomes was that substantial numbers of school-going learners were engaging in unprotected sexual activity. As a result, 7.4% of them knew they had already suffered from an STI. Many students may also have had asymptomatic STIs without knowing it. Almost every fifth girl (19.2%) of those who had

sex reported being pregnant at some point. Less than one third (28.8%) of learners indicated consistent condom use. Among those not using condoms, they might lack information about how to protect themselves or might not feel empowered enough to practice safer sexual behaviours. In any case, they need education on HIV prevention. Two thirds (65.9%) of the interviewed learners felt that they were able to protect themselves against contracting HIV. The small proportion of students consistently using condoms suggests that learners have limited ability to assess their levels of risk and to reduce their risk behaviours.

4. Control of STIs for HIV prevention

Peter R. Lamptey draws attention to the magnitude of the STI problem with more than 300 million new cases of curable STIs occurring each year worldwide, mainly in poor countries [21]. He emphasises that not only behavioural risk factors and global distribution are similar for STIs and HIV, but that STIs are one of the key factors in the heterosexual transmission of HIV. Therefore, he calls on effective STI management to reduce the risk of HIV infection.



Three major community-level, randomised trials have been conducted to examine the potential impact of STI treatment on HIV prevention. All studies were located in rural African districts: Mwanza in Tanzania [22], Rakai [23] and Masaka [24] in Uganda.

In 1995, H. Grosskurth et al conducted the first randomised trial to demonstrate the impact of a preventive intervention on HIV incidence in a general population [22]. The study was conducted in Mwanza District in Tanzania with 12,537 individuals having

been surveyed at baseline and 8845 at follow-up two years later. The intervention consisted of various components to improve STI case management at primary health care level. The result showed that HIV incidence was consistently lower in the intervention communities compared to the comparison communities. With no change in reported sexual behaviour having been observed in either group, the authors concluded that improved STI management reduced HIV incidence by 40% in that rural population (estimated risk ratio = 0.58, $p = 0.007$).

In Uganda's Rakai District, an ongoing (1994-1998) randomised, community-based trial assessed the assumption that intensive STI control efforts would result in marked declines in HIV/AIDS prevalence [23]. More than 10,000 individuals participated in the study. Mass treatment for STI was offered in the intervention group regardless of symptoms or laboratory testing while identical health education, condom promotion, and serologic counselling services were given to both the intervention and control groups. As a result, Wawer MJ et al found that the incidence of HIV infection was still the same in both groups after 20 months although significant lower STI prevalence was shown in the intervention group. They concluded that a substantial proportion of HIV acquisition appeared to occur independently of treatable STI cofactors in the Rakai population [25]. The results of the Rakai trial, which did not demonstrate any reduction in HIV transmission despite mass STI treatment, seem to be contradictory to those of the Mwanza trial, which showed a 40% reduction in HIV transmission with comparable interventions. The authors of both studies agree in a joint paper that their trials unexpectedly produced contrasting results [26]. However, with both trials having tested different interventions in different HIV epidemic settings, using different evaluation

methods, the authors feel that the divergent outcomes may be complementary rather than contradictory. Possible explanations include: differences in stage of the HIV epidemic, which can influence exposure to HIV and the distribution of viral load in the infected population; potential differences in the prevalence of incurable (viral) STIs, which were not affected by the mass treatment; and possibly greater effectiveness of continuously available services (Mwanza) compared to intermittent mass treatment (Rakai) to control rapid STI re-infection.

Between 1994 and 2000, A. Kamali et al investigated 18 communities in Masaka (about 14,000 participants aged 13 years or older) using a three-armed approach made of behavioural interventions alone, behavioural and syndromic STI interventions and routine government health services only [24]. Results showed that the used interventions were insufficient to reduce HIV incidence, which was the primary outcome. In comparison with the Mwanza and Rakai trials, the authors concluded that the type of intervention could not be the key difference in results considering similar outcomes in the Rakai trial despite STI mass treatment but reduction in HIV incidence after comparable syndromic STI management in Mwanza. Kamali et al suggest population characteristics to be of more importance as shown in similar mature HIV epidemics in Rakai and Masaka as well as reduced effects of STI interventions due to high prevalence of viral STIs [24].

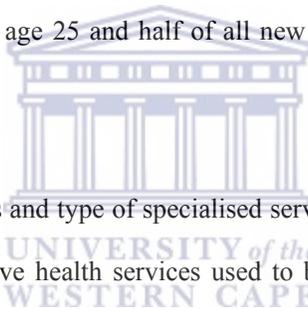
5. Access to STI treatment for young people

5.1. Youth friendly health services

The World Health Organisation (WHO) defines adolescents as persons between 10 and

19 years of age [27]. The terms “young people” and “youth” generally refer to those aged 10-24 years, comprising of adolescents and young adults aged 20-24 years as been summarized by J. Senderowitz et al [28]. The same terminology will be followed in the present study where “young people” and “youth” are used interchangeably for those between 10 and 24 years while the 10-19-year-olds are referred to as adolescents.

In a WHO newsletter from 2003 [29], it is pointed out that sexual and reproductive health needs of adolescents differ from those of adults and require an effective and acceptable response. Many people start engaging in sexual activities during adolescence. This activity is often premarital, not planned and unprotected. Possible consequences include unplanned pregnancies and STIs. Statistics illustrate the magnitude of this problem: at least one-third of the estimated 340 million cases of curable STIs occurring worldwide every year are in people under age 25 and half of all new HIV infections occur among those aged 15 to 24 years [29].

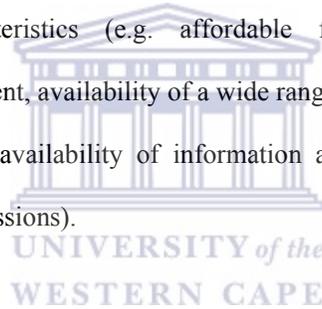


J. Senderowitz assessed reasons and type of specialised services needed by young people [30]. She states that reproductive health services used to be reserved for elder married women, with younger married women having been tolerated. Meanwhile, unmarried young women and young men were excluded. Yet, adolescent behaviour including experimentation and risk-taking, often combined with feeling invulnerable to negative consequences, puts young people more at risk of pregnancy and STIs. Longer periods of nonmarital sexual activity and the HIV pandemic that “disproportionately affects adolescents and young adults”, add to a situation where young people need more reproductive health care, especially prevention services. But since they face many

barriers to service use (e.g. embarrassment, fear of lacking confidentiality, concerns that staff members might be hostile and judgemental, transportation and financial constraints) alternative approaches are needed to attract, serve, and retain young clients.

The key characteristics for youth friendly services have been identified by WHO [31, 32], FHI [33], Advocates for Youth [34] and independent researchers. They can be summarized as follows:

1. Provider characteristics (e.g. specially trained staff that is respectful for young people and honours privacy and confidentiality, allocation of adequate time, availability of peer counsellors).
2. Health facility characteristics (e.g. convenient location and hours, separate space, comfortable environment).
3. Program design characteristics (e.g. affordable fees, flexible appointment arrangements, youth involvement, availability of a wide range of services).
4. Other characteristics (e.g. availability of information and education materials and services as well as group discussions).



K. Dehne and G. Riedner draw attention to the fact that most adolescent reproductive health projects clearly give preference to sexual health counselling and family planning compared to STI care among their service delivery objectives [35]. The authors are critical of the fact that the clinical management of STIs and other specific needs of adolescents with STIs are not considered adequately. They recommend that STI care delivery should be defined as a priority service element for adolescent friendly reproductive health clinics.

5.2. Youth and adolescent health services in Namibia

In Namibia, adolescent and youth health belong to the sub-division of reproductive and child health within the family health division. Unfortunately, the relevant policy [36], does not elaborate much on adolescents and youth. Their major sexual and reproductive health problems are characterized rather widely with early sexuality, pregnancy, HIV/AIDS and other STIs. “Youth” are defined as people between 19 and 30 years of age. Thus, they do not include but overlap at the age of 19 with “adolescents” (10-19 years). This diversion from the general understanding of youth as 10-24-year-olds makes international comparison difficult. Moreover, many of the specific aspects discussed for young people may no more apply for those above 24 years.

While no specific policy exists on adolescent health in Namibia, a strategic framework was compiled for the introduction of adolescent friendly health services [37]. Other than in the reproductive health policy [36], this document defines “youth” as the population group between 15 and 24 years while those aged 10 to 30 years are referred to as “young people”. Thus, the latter now include the 10-19-year-old “adolescents”, who are the target of the adolescent friendly health services (AFHS) concept described in this framework. The main points addressed include the justification for establishing AFHS (e.g. attempts to standardize approaches of reducing barriers to obtain adolescent health care services), the implementation of AFHS (including criteria for AFHS environment, establishment of “Adolescent Consultative Committees”) and assessment of progress with a given assessment tool. Currently, Namibia is piloting AFHS in six districts before considering introducing the concept nationwide [37].

C. METHODOLOGY

1. Aim of the study

The aim of this study is to assess knowledge and behaviours of grade12 students from Tsumeb regarding the importance of recognising STI symptoms and seeking STI treatment to reduce sexual HIV transmission.

2. Objectives of the study

Among grade 12 students from Tsumeb, Namibia this study seeks to :

- Assess the level of knowledge about STIs and symptoms.
- Assess knowledge regarding similarities, differences and possible links between HIV and other STIs.
- Assess knowledge of the importance of STI treatment to reduce sexual HIV transmission.
- Determine risk behaviours
- Identify barriers to accessing STI treatment



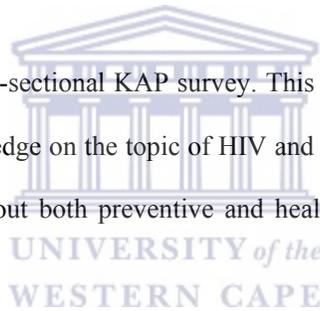
The findings of this study will be used to formulate recommendations to the Namibian Ministry of Health and Social Services regarding health education for adolescents about early detection and treatment of STIs as a component of comprehensive HIV prevention programs. Furthermore, recommendations regarding the implementation and expansion of adolescent friendly health services will be included.

3. Delimitation of study area

The study focuses specifically on grade12 students of public senior secondary schools at Tsumeb to ensure similar educational background of young people living in the same urban setting. The idea is to find out what young people know regarding STIs and assess the sexual risk and health seeking behaviours. Participants were asked questions regarding their behaviours to assess levels of understanding, acceptance, and practical implementation of possible interventions to reduce sexual HIV transmission. Whilst acknowledging the priority importance of abstinence and consistent condom use, this study seeks to find a realistic approach to HIV prevention against the background of many people engaging in risky sexual behaviours.

4. Study design

The study conducted is a cross-sectional KAP survey. This design was chosen to ensure that the young people's knowledge on the topic of HIV and other STIs could be assessed as well as their perception about both preventive and health seeking interventions and their respective behaviours.



5. Study area

Tsumeb is a small town with a population of about 25,000 people in Oshikoto Region in northern Namibia. It is surrounded by commercial farmland. No communal farmland is available for subsistence farming. This causes major problems for the many unemployed. There are three public and one private senior secondary schools in Tsumeb.

6. Sampling and data collection

6.1. Study population

All learners attending grade 12 classes at any of the three Tsumeb public senior secondary schools (Etosha, Otjikoto, and Tsumeb Secondary School) at the time of the study were registered for the study with the total sample size consisting of 233 students. The focus on grade 12 students was based on assumptions that they would be more likely to be sexually active and to have received some education about STIs and HIV than learners in lower grades.

6.2. Data collecting tool

A self-administered standardised questionnaire in English language, the medium at all three schools that participated in the study, was used for data collection. The questionnaire was adapted by the investigator from the SA National Youth Risk Behaviour Survey 2003 [20], including only questions that related to the current study objectives. Additional items referred to the importance of STI treatment to reduce sexual HIV transmission. The questionnaire was divided into seven sections, namely Personal Details, Education about STIs and HIV, Knowledge on STIs, Access to STI treatment, Knowledge on HIV, HIV and other STIs, and Sexual Behaviour. An introductory paragraph prior to the last set of questions dealing with sexual behaviour was used to warn participants about the sensitive nature of those questions and to reassure confidentiality. The questionnaire comprised of a total of 24 questions. Of these, 20 were designed in multiple-choice format, two requested a numerical response and two were open-ended questions. The open-ended questions (“Ways to prevent STI transmission”

and “Reasons not to seek treatment for STI symptoms”) required a short text to avoid manipulation of responses by offering optional answers (Appendix 1).

6.3. Pilot study

A pilot study was conducted at an English medium public senior secondary school in the neighbouring town of Grootfontein in mid-August 2005. This exercise was carried out to make certain that the data collecting tool would provide the required information and the questions would be clear and well understood by the students. In addition, the time required to complete the questionnaire was determined (10-15 minutes). Out of the 115 grade 12 students present during the piloting, 50 were chosen randomly for completing the questionnaires. Thereafter, the whole group was included for the ensuing discussion. This highly participatory exercise was mainly used for educational information. Since not everybody had completed the questionnaire, it was read out and discussed question by question (with the exception of the behavioural part). Thanks to the students’ openness and great interest, many ambiguous issues and prevailing misconceptions could be identified and clarified. The testing led to minor adjustments of the questionnaire. For example, a previously open-ended question asking about symptoms of STIs other than HIV was changed into multiple-choice format offering five correct and five incorrect options. Most of these options (e.g. “Flu symptoms like running nose” or “Severe weight loss”) were chosen from the list of answers received from participants of the pilot.

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Comment: Why delete? I find this statement important, esp. since main findings correspond with those of the main study.

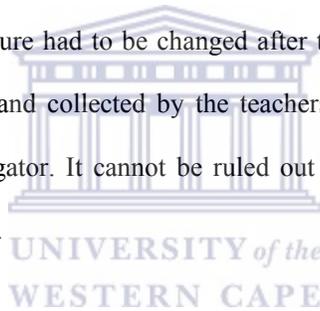
6.4. Data collection

Before data collection commenced, the principals of the three selected schools were informed about the study. The purpose, possible benefits, and methods of the study were

explained to them in detail. They were provided with copies of the questionnaire for review and approval. All principals gave permission for the study to be carried out at their respective schools. Data collection was carried out between the 8th and 15th of September 2005.

At the first two schools, data collection could be carried out as planned according to the protocol: the investigator informed participants about the purpose and possible benefits of the study. The students were told that they could leave any question blank and that their answers would remain confidential. Students were requested not to write their names on the questionnaire to ensure anonymity. The investigator distributed the questionnaires personally. After completion, participants had the choice to either return their questionnaire personally into a box or have them collected by the investigator to be put into the box.

At the third school, the procedure had to be changed after the principal insisted to have the questionnaires distributed and collected by the teachers of the respective grade 12 classes and not by the investigator. It cannot be ruled out that this might have had an influence on the quality of data.



7. Validity

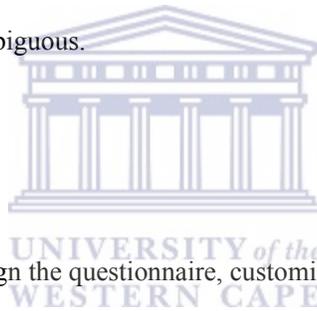
Validity to ensure that the tool actually measured what it was supposed to measure was tested during the piloting of the questionnaire. Alterations were made to the questionnaire before the actual data collection to ensure validity of the tool.

External validity, which examines “the extent to which the results of the study can be generalized” [38] is considered to be high for the sample area since all grade 12 students

of all public senior secondary schools of Tsumeb who were present at the time of data collection and willing to participate were included in the study. Since the three participating schools can be regarded as three independent samples, consistency of answers between these test samples will be of assistance in assessing validity of data.

With all participants coming from the same area, generalisation of study outcomes for the whole of Namibia might be difficult. Certain conditions and settings usually vary from one town to another. Potential factors that might influence the results include the (non-) existence of life skills programmes, guidance counsellors, sex education, peer education programmes, but also issues like size, demography and level of anonymity of a town, prices for transport, and distance to the nearest health facility.

Reliability is assumed to be high with the measurement expected to be rather consistent, i.e. similar outcomes would be anticipated on repetition of the study because the questions were clear and unambiguous.



8. Data Analysis

Epi Info 2002 was used to design the questionnaire, customize the data entry process, and enter the data. The same program was used for estimating relative frequencies, 95% confidence intervals and to produce statistics, graphs, and tables.

For continuous variables, numbers were entered as indicated by the participants (e.g. number of years for age) while code numbers were allocated for categorical variables (e.g. sex: 1=female; 2=male). Multiple answers were allowed for open-ended questions. Data retrieved from these questions were not quantifiable due to different numbers of

answers per respondent as well as different wording. The various answers given by respondents were all listed up and their rate of recurrence counted. For topics of specific interest, e.g. to determine risk behaviours of those who indicated very early sexual debut, answers given in the respective individual questionnaires were analysed manually one by one in detail. Validity and consistency of data across schools and gender was evaluated with significance tests (i.e. chi-squared tests).

9. Ethical considerations

Ethical clearance and approval to conduct the study were obtained from the Higher Degrees Committee of the University of the Western Cape as well as from the Namibian Ministry of Health and Social Services Research Committee.

The study was carried out in senior secondary schools with permission of the respective school principals. Anonymity and confidentiality were ensured. Participants were asked not to state their names to ensure anonymity. After completion, questionnaires were returned into a box for anonymous collection. All information collected was kept in strict confidence. Participants were informed that they were free to withdraw from the study at any time without giving reasons and that their rights and welfare were safeguarded. Their consent to participate was given by filling in the questionnaire. No separate consent form had to be signed to avoid disclosure of names and ensure anonymity.

D. RESULTS

1. Summary of data

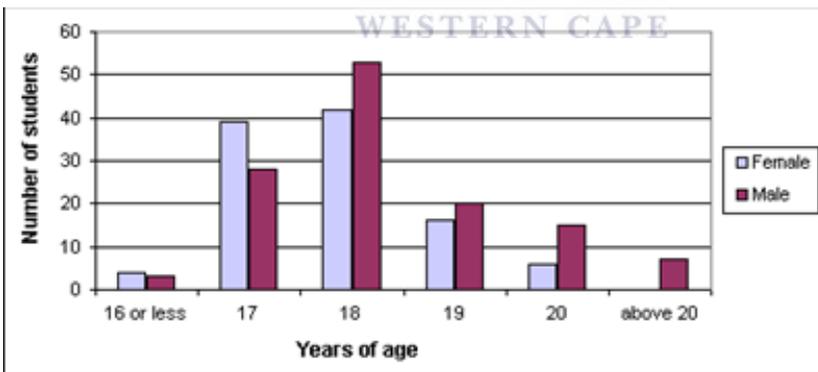
1.1. Validity of data

Validity of data has to be assured before discussing results in detail. Data from the three schools can be regarded as three independent samples. Results show large consistency between schools (Table 1, Appendix), which points to a high validity of answers given by the students.

1.2. Sample population: age and gender (Figure 1)

The sample population consisted of 233 grade 12 students. Ages ranged from 15 to 25 years with a mean age of 18.1 years. The mean age of the 107 girls was 17.8 years and the mean age of the 126 boys was 18.4 years. Female ages ranged from 15 to 20 years and male ages from 16 to 25 years, with both of them showing a normal distribution ($p \geq 0.05$). Gender difference for age (0.54 years) is highly significant ($p < 0.0027$).

Figure 1: Age distribution by gender

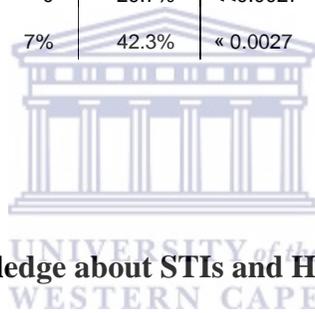


1.3. Gender differences

Most data of the questionnaire could be calculated in percentages (i.e. yes vs. no answers). These are summarized in Table 1. According to chi-squared (χ^2) tests [39], differences between schools as well as between totals of males and females in Table 1 are not significant ($p > 0.05$) in all but a few cases. Hence, most results will be presented combining data from males and females from all three schools. Significant gender differences (Table 2) will be handled separately.

Table 2.: Summary of chi-squared tests yielding significant differences

Question	Female	Male	p	Level of significance
Students' estimates of HIV prevalence 15-25%	2.0%	14.0%	< 0.0027	+++
Students' estimates of HIV prevalence >50%	73.5%	55.4%	< 0.01	++
Ever had sex	38.4%	73.9%	<< 0.0027	+++
Sexual debut <14	0	29.7%	<<0.0027	+++
Sexual debut <16	7%	42.3%	« 0.0027	+++



2. Education and knowledge about STIs and HIV

2.1. Education

Almost all respondents (220/231 = 95.2%; 95% CI 91.6 – 97.6%) indicated that they had received education about STIs and HIV at school. Most (213/233 = 91.4%; 95% CI 87.1 - 94.7%) stated that they had discussed these topics with friends and more than three quarters (180/233 = 77.3%; 95% CI 71.3 - 82.5%) had talked about STIs and HIV at home, for example with their parents.

2.2. General knowledge on HIV and other STIs

There were 14 knowledge questions about HIV and other STIs. By assigning one point for each correct answer as defined in Table 3, a maximum of 14 points could be reached.

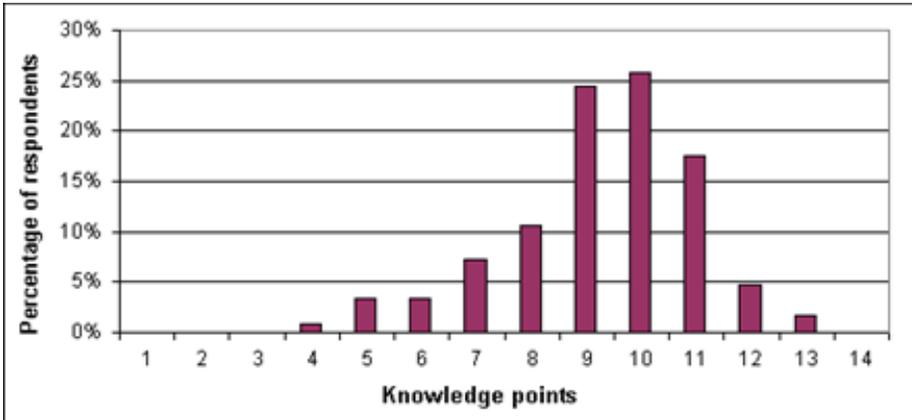
Table 3: Scoring system for knowledge questions about HIV and other STIs

Question	Points allocated for:
1. Can Syphilis be transmitted through sexual contact?	"YES"
2. Can Tuberculosis be transmitted through sexual contact?	"NO"
3. Can HIV/AIDS be transmitted through sexual contact?	"YES"
4. Can Gonorrhoea be transmitted through sexual contact?	"YES"
5. Can Hepatitis B be transmitted through sexual contact?	"YES"
6. Can Pneumonia be transmitted through sexual contact?	"NO"
7. Is it possible to be infected with an STI without having any symptom?	"YES"
8. Identification of symptoms/signs/complaints that might be caused by an STI other than HIV. (Multiple choice with 5 correct and 5 incorrect options)	>5 scores (>50% correct)
9. Which STIs are curable (all/some/none)?	"Some"
10. Description of ways to prevent STI transmission (open end question)	At least one correct way*
11. Identification of body fluids transmitting HIV. (Multiple choice with 4 correct and 2 incorrect options)	At least 3 out of 4 correct options*
12. Identification of possible ways of HIV transmission. (Multiple choice with 3 correct and 2 incorrect options)	At least 2 out of 3 correct options*
13. Identification common characteristics of HIV/AIDS and other STIs. (Multiple choice with 2 correct and 3 incorrect options)	2 correct options*
14. Can STI treatment reduce the risk of sexual HIV transmission?	"YES"

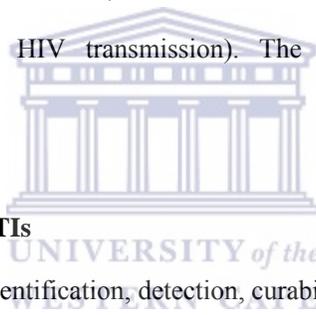
* No point was awarded, if any incorrect option was included in the answer.

The mean was 9.3 knowledge points, which is equivalent to 66.4% of questions answered correctly. 92.3% (215/233; 95% CI 88.1 – 95.4%) of the respondents answered at least 50% correctly and half of them (117/233 =50.2%, 95% CI 43.6 – 56.8%) more than 70%. Figure 2 shows the distribution of points (1-14) for all 233 students.

Figure 2: Distribution of knowledge points in percent:



A closer look at the few wrong answers of those who had scored 11-13 knowledge points showed that all of them had made mistakes in at least one of the two questions referring to the link between HIV and other STIs (common characteristics and whether or not STI treatment can reduce sexual HIV transmission). The following sections analyse knowledge in more detail.



2.3. Specific knowledge on STIs

Several variables referring to identification, detection, curability, and prevention of STIs were used to assess the students' knowledge on STIs.

2.3.1. Distinguishing STIs from non-sexual infections

Almost all respondents correctly assigned HIV as sexually transmittable (225/233 = 96.6%, 95% CI 93.3 - 98.5%) while Syphilis and Gonorrhoea were identified as STIs by 79% (184/233; 95% CI 73.2 - 84.0%) and 69.1% (161/233; 95% CI 62.7 - 75.0%), respectively. Only very few students were aware of the fact that Hepatitis B can be

transmitted sexually (28/233 = 12%; 95% CI 8.1 - 16.9%). Tuberculosis and Pneumonia were identified correctly as non-STIs by 97.4% (227/233; 95% CI 94.5 - 99.0%) and 96.6% (225/233; 95% CI 93.3 - 98.5%), respectively.

2.3.2. STI symptoms

Regarding the recognition of symptoms for STIs other than HIV, 158 out of 231 students (68.4%; 95% CI 62.0 – 74.3%) correctly assigned more than 50% of symptoms from a list of five correct and five incorrect options. The two key symptoms for syndromic STI management, genital sores and discharge, were known as STI symptoms by 89.6% (95% CI 85.8 – 93.4%). At the same time, less than half of the respondents (45.6%; 95% CI 39.0 - 52.3%) were aware that a person might be infected with an STI without showing any symptoms (Figure 3).

2.3.3. STI Prevention

Almost all students (222/225 = 98.7%; 95% CI 96.2 – 99.7%) could describe at least one way to prevent the transmission of STIs and 84.4% (190/225; 95% CI 79.0 - 88.9%) knew two ways of STI prevention (Figure 3).

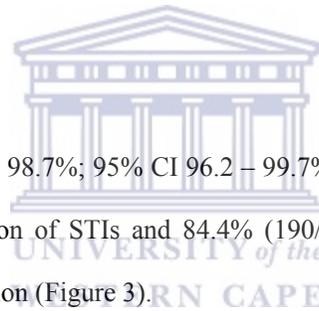
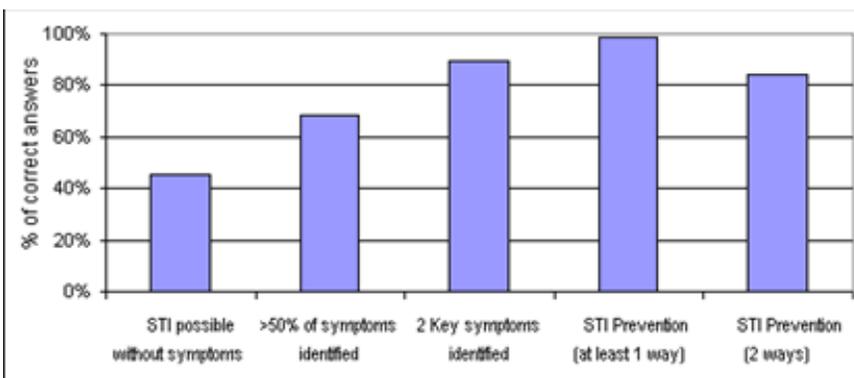


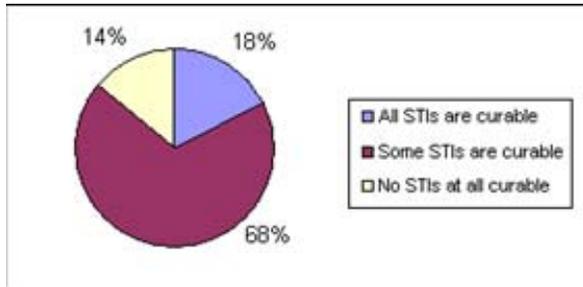
Figure 3: Knowledge on STIs



2.3.4. STI Curability

Out of 225 scholars, 153 (68%; 95% CI 61.5 - 74.0%) answered correctly that some STIs could be cured while others are incurable (e.g. HIV) whereas 17.8% (40/225; 95% CI 13.0-23.4%) thought that all STIs could be cured and 14.2% (32/225; 95% CI 9.9-19.5%) were convinced that no STI could be cured but only symptoms be treated (Figure 4).

Figure 4: Perceptions about the curability of STIs



2.4. Specific knowledge on HIV

The general knowledge about HIV was good in all three schools and both sexes.



2.4.1. Body fluids transmitting HIV

From a choice of six body fluids offered to transmit HIV (including four correct and two incorrect options), three quarters of the 233 students (74.2%; 95% CI 68.1 – 79.7%) identified at least three of the four correct answers and almost half of students (45.5%; 95% CI 39.0 - 52.1%) identified all four correct options. Only 3.9% (95% CI 1.8 - 7.2%) of the students included any of the incorrect options (i.e. urine or sweat) in their answers (Figure 5).

2.4.2. Mechanisms of HIV transmission

Knowledge on mechanisms of HIV transmission was even better, again in all three schools and both sexes. From a choice of five possible mechanisms of HIV transmission (including three correct and two incorrect answers), 96.5% (95% CI 93.3 – 98.5%) of the 230 students who answered could identify at least two correct mechanisms and 89.1% (95% CI 84.9-93.2%) identified all three of them. Only three scholars (1.3%; 95% CI 0.3-3.8%) included incorrect answers of HIV transmission, e.g. through biting insects (Fig 6).

Figure 5:

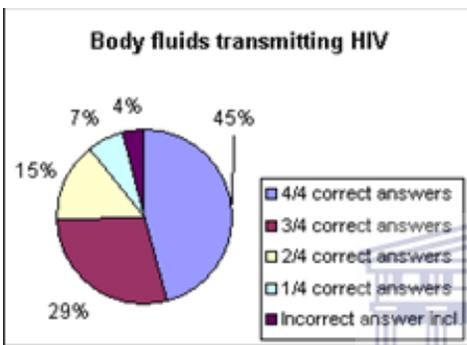
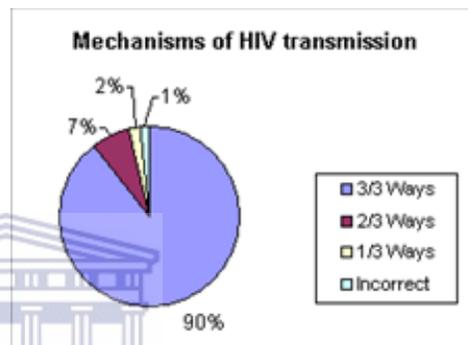


Figure 6:



2.5. Knowledge on links between HIV and other STIs

Despite good knowledge about both HIV and other STIs, the students' knowledge regarding similarities, differences and, most importantly, possible links between HIV and other STIs was rather poor. Just less than one fifth of them (19.8%; 95% CI 14.9 - 25.5%) were aware that STI treatment could reduce the risk of sexual HIV transmission (Figure 7). Only 15.4% (95% CI 11.0 - 20.8%) of respondents correctly identified the two characteristics out of a choice of five that other STIs and HIV have in common (sexual transmission and preventability). (Figure 8).

Figure 7:

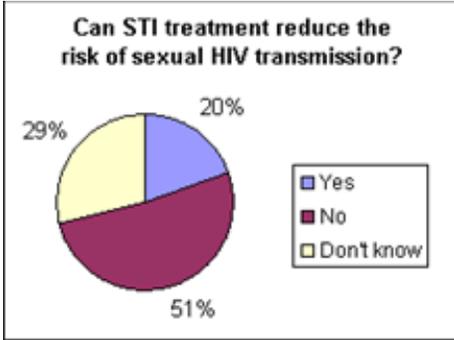
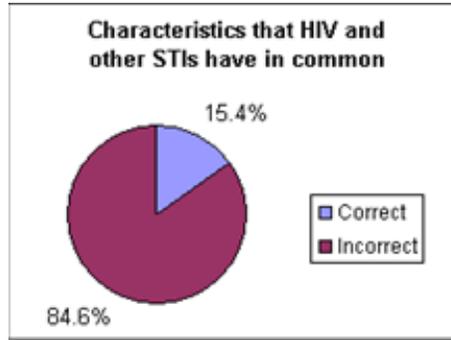


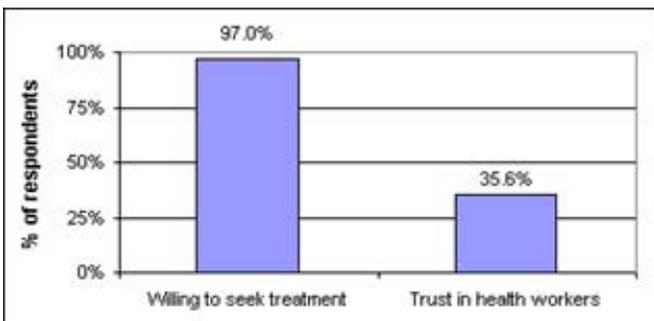
Figure 8:



3. Access to STI treatment

Most of the respondents (97.0%; 95% CI 93.9 - 98.8%) indicated that they would seek treatment when suspecting that they had an STI. 78.8% (95% CI 72.8 – 83.9%) of them would go to the local hospital or clinic for treatment while 5.3% (95% CI 2.8 - 9.1%) would prefer to go to a clinic in another area and 15.9% (95% CI 11.4 - 21.4%) to a private doctor. But willingness to seek treatment may be counteracted by the mistrust of almost two thirds of the students (64.4%; 95% CI 57.9 - 70.5%) in health workers at the local health facilities to be confidential (Figure 9).

Figure 9: Willingness to seek treatment and trust in health workers



4. Sexual behaviour

Out of ethical considerations, questions concerning sexual behaviour are sensitive. Students were therefore explicitly reminded that they were free to answer these questions or not. As a consequence, the number of respondents is lower than with other questions.

4.1. Belief and ability to protect themselves

The question whether the students thought they could protect themselves to avoid HIV was answered positively by 85.9% (95% CI 80.3 - 90.4%). (Figure 10)

4.2. No sexual activity

Asked about their sexual behaviour, 41.6% (95% CI 34.7 – 48.8%) stated that they never had sex and the remaining 58.4% (95% CI 51.2 – 65.3%) said that they had been sexually active (Figure 10).

4.3. Use of condoms

Of the 115 students having had sex, 54.8% (95% CI 45.2 – 64.1) indicated that they would always use a condom and almost three quarters (73.0%; 95% CI 64.0 – 80.9%) stated that they had used a condom during their last sexual intercourse (Figure 10).

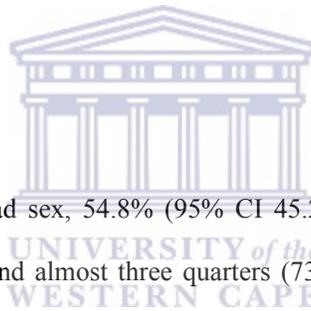
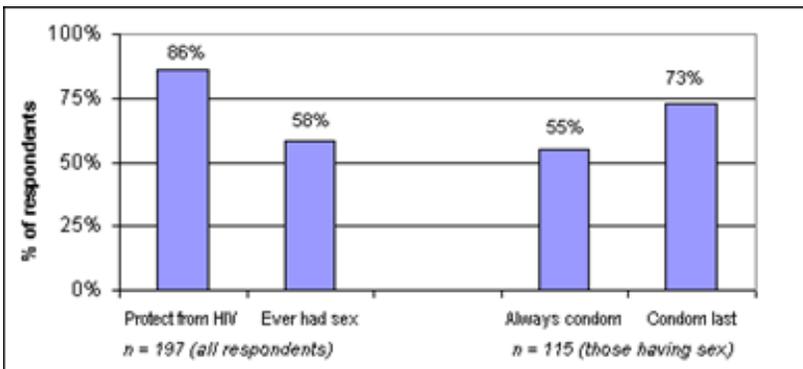


Figure 10: Perception about protection from HIV and sexual behaviour



4.4. Occurrence of missing answers

Out of the 233 learners, 34 (14.6%; 95% CI 10.3 – 19.8%) did not answer at all whether or not they believed that they could protect themselves from ever contracting HIV. Of these, 32 (94%) came from the same school, one each from the two other schools. The same school accommodated 94.7% (36/38) of those students who skipped the question of whether or not they had sex (Table 4).

5. Cases of significant gender differences (Figure 11, Table 1 and 2)

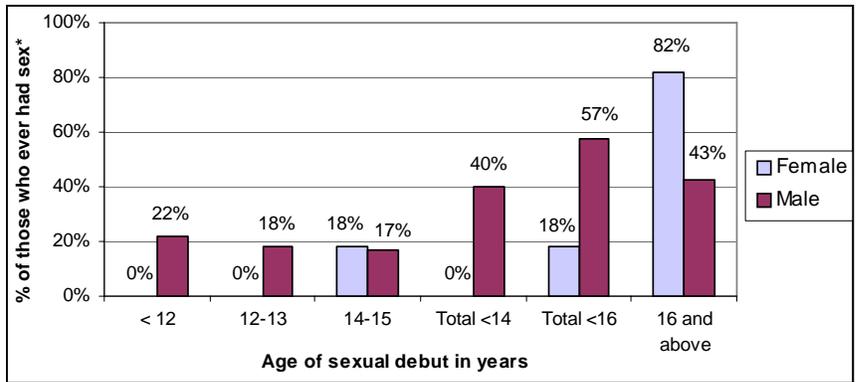
5.1. Ever had sex

Out of the 115 students who said they were having sex, 82 (71.3%; 95% CI 62.1 – 79.4%) were male and 33 (28.7%; 95% CI 20.6 – 37.9%) were female. Looking at the highly significant gender difference ($p < 0.0027$) in another way: 82 of 111 male respondents (73.9%) had had sex compared to 33 of the 86 female respondents (38.4%).

5.2. Age of sexual debut

Differences between genders regarding the age of sexual debut were highly significant ($p < 0.0027$). More than half of the 82 sexually active boys had started their sexual activities before the age of 16 years (57.3%; 95% CI 45.9 – 68.2%), but only 18.2% (95% CI 7.0 – 35.5%) of the 33 sexually active girls. All of these girls were above 14 years at their sexual debut whereas 18.3% (95% CI 10.6 – 28.4%) of the boys were between 12 and 13 years and 22.0% (95% CI 13.6 – 32.5%) were less than 12 years old. Among those engaged in sexual activity, mean age of sexual initiation was about 14.6 years in boys and 16.7 years in girls.

Figure 11: Age of sexual debut among students who ever had sex



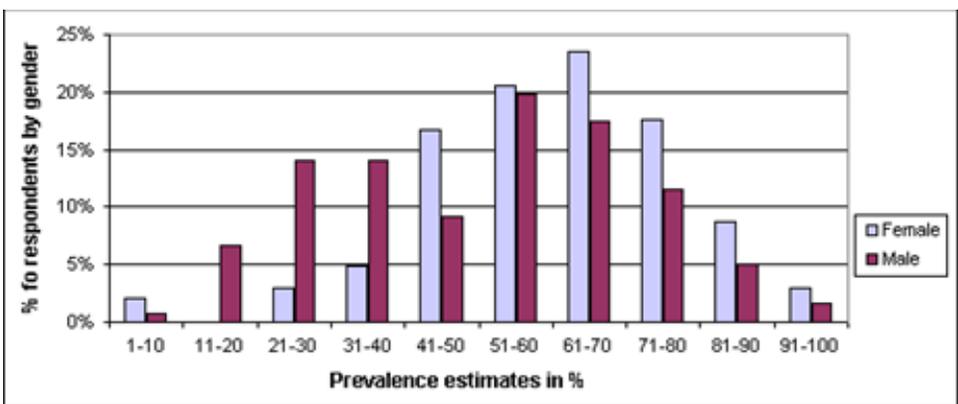
* Females who ever had sex: 33/86 = 38%

*Males who ever had sex: 82/111 = 74%

5.3. HIV prevalence estimates

The estimated national HIV prevalence based on antenatal surveys [5] is 19.6%. Students were asked to estimate the prevalence of HIV in sexually active adults in Namibia. Answers reflect significant gender differences (Tables 1 and 2, Figure 12). The distribution of prevalence percentages given by boys is clearly bimodal. A first peak near 20% is close to the correct value, the other around 60%. Prevalence percentages estimated by girls are almost normally distributed with a mean close to 60%.

Figure 12: Distribution of HIV-prevalence percentages estimated by males and females

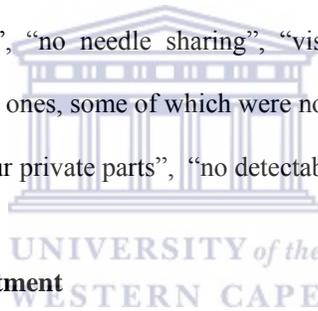


6. Responses to open-ended questions

The following open-ended questions had to be answered with a short text: (1) “Please describe two ways to prevent STI transmission” and (2) “For what reason would you not seek treatment for STI symptoms?” No statistical analysis is possible for these questions since the number of answers differs from responder to responder as do their weight and wording.

6.1. Prevention methods

Girls and boys alike give equal and high priority to “condom use” (roughly 35% and 43%, respectively) and “abstinence” (same percentages). “Faithfulness” and “one partner only” are following, yielding together about 20% in girls and 14% in boys. Girls listed some more items (10%) including relevant (“partners must be tested before having sex”, “knowledge of partner status”, “no needle sharing”, “visit doctor to treat STI with antibiotics”) and miscellaneous ones, some of which were not correct (“Prevent oral sex”, “take multivitamins”, clean your private parts”, “no detectable signs on partner”).



6.2. Reasons not to seek treatment

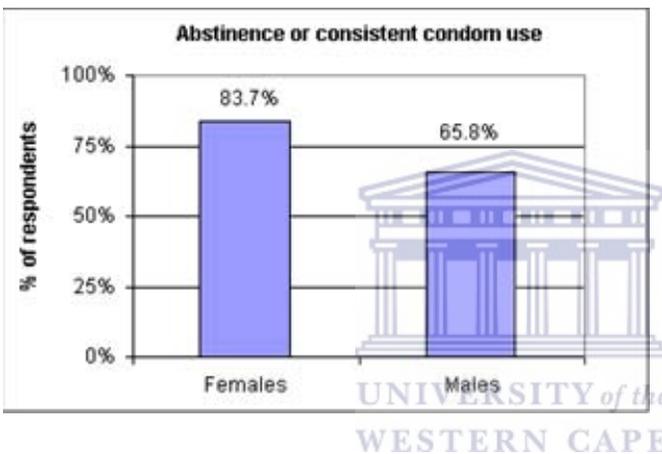
The complex of shame, fear (locals, parents, friends - “people pointing fingers on me”), pride and embarrassment combined with mistrust in confidentiality of health workers was the main argument not to seek treatment, stated by roughly 80% of the girls and 40% of the boys. About 11% of the girls and 19% of the boys saw “no reason” not to seek treatment. Very few respondents referred to challenges in geographical accessibility or payment of treatment as reasons not to seek treatment. A surprising 10% of boys as well as of girls were scared to possibly find out that they could not be cured.

7. Safe sexual behaviour

Abstinence and the use of condoms are generally acknowledged as very safe ways to prevent sexual transmission of HIV and other STIs. Therefore, the two variables “ever had sex = no” and “condom use = always” for those who had engaged in sexual activities (“ever had sex = yes”) were combined to assess the frequency of respondents exhibiting safe sexual behaviour. This procedure yielded 83.7% of females (72/86; 95% CI 74.2 – 90.8%) and 65.8% of males (73/111; 95% CI 56.2 – 74.5%) showing safe sexual behaviour (Figure 13).

Comment: This is included in condom use = always. As a single variable, it does not have the same value since it does not say anything about consistency.

Figure 13: Safe sexual behaviour in females and males



Females practised safe sex behaviours significantly more than males ($p > 0.0027 < 0.01$ ($\chi^2 = 8.04$, d.f.=1)). The above percentages are minimum estimates. Part of those trusting in “faithfulness” and “one partner only” (most common answers in the prevention question) may further contribute to the proportion of students practising safe behaviour. But that part of the ABC strategy was not included in this analysis as safe behaviours.

E. DISCUSSION

1. Knowledge

General knowledge on HIV and other STIs was good in all three schools in boys and girls. Close to 100% of students were familiar with mechanisms of transmission and ways of prevention.

The majority of students overestimated the HIV prevalence among sexually active adults in Namibia by far. Only a small proportion estimated it correctly. This shows that students believe the HIV epidemic to be worse than it actually is.

90% of students knew that genital sores or discharge are symptoms of STIs. These are key symptoms to recognise because syndromic STI management focuses on them [9].

14% of students thought that no STIs are curable. Such perceptions need to be clarified since they might inhibit treatment-seeking behaviour.

Despite good understanding of basic facts about STIs and HIV, knowledge regarding the interrelation between HIV and other STIs was unsatisfactory. Only every fifth (19.8%) student was aware that STI control could reduce the risk of sexual HIV transmission. Even less (15.4%) identified sexual transmission and preventability as characteristics that HIV and other STIs have in common.

2. Education

Almost all participants stated that they had received education on STI/HIV at school. The lack of knowledge with respect to the interrelation between HIV and other STIs, suggests that this specific topic might not be part of schools' health education. Curricula should be strengthened by teaching the curability of STIs and the importance of STI treatment to

Comment: Did you check the curriculum?

prevent HIV transmission. In addition, one very serious aspect that needs to be emphasised to young people is that HIV and other STIs are transmitted the same way. Therefore, STIs are a clear proof of risky sexual behaviour.

3. Access to STI treatment

97% of students stated that they would seek treatment if they suspected they had an STI. When asked for possible reasons that could keep them from actually doing so, many of them could not imagine not seeking treatment. Almost none mentioned distance to or payment of treatment as a possible hindrance. However, most saw serious setbacks in actually seeking treatment due to mistrust in health workers. This was expressed as “fear that personnel and especially nurses may chat around”. Only one third of learners confirmed that they “trust health workers to be confidential”. In a study in South Africa, Wood et al. [40] gave documented similar statements from teenagers like “nurses’ management of side-effects was a source of dissatisfaction ... teenagers often did not feel that they were taken seriously when they reported side-effects” and these statements were not rejected by the nurses. This clearly calls for students to be informed that health workers are bound professionally to confidentiality. There may also be a need to train nurses on professional codes of conduct including protection of confidentiality.

Of concern are the 10% of males and females apparently not willing to seek treatment because they believe that STIs cannot be cured. Further analysis of the respective individual questionnaires showed that the majority of these learners reported inconsistent condom use, often combined with early sexual debut. They constitute, moreover, the biggest part of those 14% (Table 1) that do not believe they can protect themselves from

becoming infected by HIV. It seems therefore mandatory, to target this high-risk group with improved education.

4. Sexual behaviour

The main findings of this study with respect to sexual behaviour include a higher level of sexual activity (73.9% vs. 38.4%) and a lower mean age at sexual debut (14.6 vs. 16.7 years) for boys than girls.

Among the sexually active students, 54.8% reported consistent condom use (“condom use = always) and three quarters indicated condom use during last sexual intercourse.

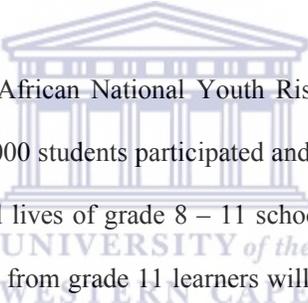
Differences in sexual behaviour were not associated with knowledge or lack thereof because levels of knowledge on HIV and other STIs did not differ much among respondents.

4.1. Comparison with results from other countries

This study measured knowledge about HIV/STI and sexual behaviours of grade 12 students in Tsumeb, Namibia. There have been two studies published since 2000 on the same subject: one in Nigeria, and one in South Africa (SA). No comparable Namibian data was available.

Nigeria: G.B. Slap et al (2003) [41] elaborated a questionnaire with 100 questions, a few of them being comparable to some in the present study. 4281 students aged 12 – 21 years answered questions in 39 schools. 1451 questionnaires answered by males and 1244 by

females, respectively, could be analysed. In comparison to the Nigerian study the mean age of respondents was higher in this study (18.1 vs. 16.3 years) as was the proportion of boys (73.9% vs. 42.7%) and girls (38.4% vs. 23.2%) reporting sexual activity. The mean age of sexual initiation among those who had sex in this study was found to be higher in girls (16.7 years vs. 15.2) but the same in boys (14.6 years). Divergences between the studies may be attributed to the difference of 1.8 years in the students' mean ages as well as to cultural differences between the countries. The authors of the Nigerian study suspected learners to have underreported their sexual activity because of fearing social reactions. Despite the fact that the Tsumeb survey was anonymous, some students in one of the schools may have had similar fears because 30.8% did not answer whether they believed they could protect themselves from HIV and 32.7% did not answer whether they had ever had sex.



South Africa: The “1st South African National Youth Risk Behaviour Survey ” dates from 2003 [20]. More than 10,000 students participated and extensive data was collected on various aspects of the sexual lives of grade 8 – 11 school attendants. For the current comparison, however, only data from grade 11 learners will be considered. They are just one grade below the students presently studied, which makes comparison of answers more relevant. Compared to the SA survey this study found a higher proportion of students who had received HIV education at school (95% vs. 72%) and who believed that they could protect themselves from ever getting HIV (86% vs. 73%). None of the Namibian girls reported sexual debut prior to 14 years of age and only 7% prior to age 16 compared to 5.6% and 27.3%, respectively, of those in the SA study. The proportion of boys who reported sexual debut prior to 14 years of age were similar in Namibia and

South Africa (29.7% vs. 27.7%). In comparison to the SA survey the present study found a much higher proportion of both girls (57.6% vs. 27.3%) and boys (53.7% vs. 37.3%) consistently using condoms among those who ever had sex.

The following data point to better results in Tsumeb, Namibia in 2005 compared to SA in 2003:

- Age of sexual debut of girls is considerably delayed.
- HIV education at school is more prevalent.
- A higher proportion of students were convinced they could protect themselves from being infected with HIV.
- Consistent condom use among sexually active students was higher, especially in girls.

4.2. Sexual debut

A remarkable outcome of the present study is the tremendous difference in age of sexual debut between males and females. In females it was always above 14 years, whereas 16.2% of all respondent males were below 12 years and 13.5% were 12 or 13 years of age. What is to be stressed here is the high frequency of boys below 12 years of age who are sexually active. This clearly leads to a bimodal distribution (Fig. 11). Bimodal distributions indicate different causalities underlying the respective distributions. Start of male sexual activity was bimodal in the Nigerian [41] study also, with comparable frequencies. The authors stated, "...initiation is more likely at age ≤ 12 years than it is between 12 and 14 years" [41]. The South African study [20], while giving low percentages of females but high percentages of males having had first sex at age 13 or younger did not further differentiate among these ages. It stated that sexual activity at

young ages is very high risk: “Learners in low grades who engaged in sexual activity appeared to be inadequately prepared for the responsibility that goes with it...Sexually active grade 8 learners reported lower rates of consistent condom use, and higher rates of pregnancies, abortions and unprotected sex than the sexually active learners in the higher grades.” The present study did not ask whether sexual behaviour with respect to condom use, duration of partnerships and other items changed with age.

Comment: You mention that you did not ask about condom use at earlier ages for ethical reasons. Although coercive or involuntary sex may be more frequent at earlier ages, it can occur at any age.

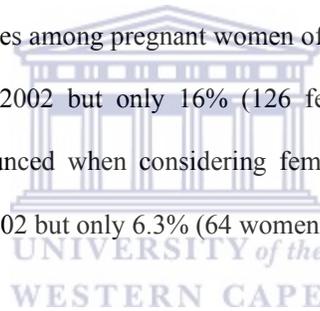
4.3. Prevention of infection

In this study, 85.5% of males and 86.4% of females believed that they could protect themselves from being infected with HIV. This was considerably higher than the 65.9% of learners with similar perceptions in the South African study [20]. The South African figures, however, are somewhat contradicted by data of the same source on safe sexual behaviour, early pregnancies, and occurrence of STIs. In Tsumeb, on the other hand, the proportion of students believing that they can protect themselves was similar to the proportion of females showing safe sexual behaviour (83.7%) but higher than the 65.8% of males exhibiting safe sexual behaviour. “Faithfulness” and “one partner only”, two methods of prevention frequently suggested by the students, may contribute to safe sexual behaviour. But since these items were more often mentioned by girls than boys, they cannot explain the above discrepancy. An explanation may, however, lay in the 18.3% of sexually active males with sexual debut <12 years. The rationale for this is the following: the South African study found that males with sexual debut <12 years were greatly unaware of health risks and exhibited quite unsafe sex. It is possible that respondents with sexual debut <12 years reflected their sexual history by not answering “yes” to the question of “condom use = always” (past) but “yes” to “believing they can

protect themselves” (now). Indeed, “Condom use = always” was only answered by 22% of the boys with sexual debut <12 years compared to 62% of males with higher age sexual debut and this difference is significant at $p = 0.0027$ ($\chi^2 = 9.11$, $df = 1$). This may also explain the difference between consistent condom use (“Condom use = always”) and condom use during last sexual intercourse (53.7% vs. 80.5%) as indicated by sexually active boys.

4.4. Measurable effects of prevention

This study clearly demonstrates sound knowledge of HIV prevention among Grade 12 students; delayed sexual debut of females, awareness of trust and fidelity, and a relatively high level of safe sexual behaviour as indicated by abstinence or condom use. These preventive behaviours may be partially responsible for recent decreases in HIV prevalence. HIV prevalence rates among pregnant women of Tsumeb antenatal clinic was 25% (169 women tested) in 2002 but only 16% (126 females tested) in 2004. The decrease is even more pronounced when considering females younger than 25 years: 15.4% (78 women tested) in 2002 but only 6.3% (64 women tested) in 2004 [5].



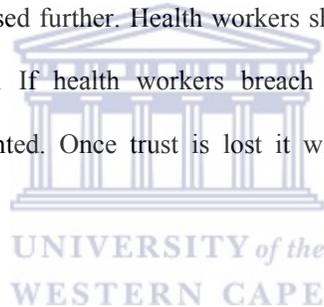
5. Limitations

This study assessed the knowledge of Tsumeb grade 12 students regarding HIV and STIs and assessed their sexual risk behaviours and care seeking behaviours. It is not known how generalisable the results are for students in other grades or other areas of Namibia. As with any behavioural survey, the accuracy of the results depends on the honesty of the respondents.

F. CONCLUSIONS

In conclusion, general knowledge of STIs and HIV was high but knowledge of the importance of STI treatment to prevent HIV transmission was low. The majority of students either abstained or used condoms consistently.

An area that will need further investigation is whether the 97% of all students who indicated that they would seek STI treatment if necessary will really do so. This may be questioned by two other outcomes of this study that require consideration. (1) About 10% thought they might not seek treatment because they believe that STIs cannot be cured. (2) Two thirds of those asked do not trust health workers. This is mainly because they believe these workers would tell other people about their condition, which is of major concern and needs to be assessed further. Health workers should receive training on the importance of confidentiality. If health workers breach confidentiality, disciplinary measures should be implemented. Once trust is lost it will be extremely difficult to rebuild.



G. RECOMMENDATIONS

The findings of this study lead to the following recommendations:

- Intensify health education on STIs other than HIV and their curability.
- Apply the questionnaire used in this study nationwide to all students of grade 5 and above. If confidentiality can be ensured, the following questions should be added:
 - a. If a person had / still has HIV or another STI.
 - b. To be answered one by one for each year of age starting at the age of 9 years:
 - Sexual activity: yes / no?
 - Number of partners?
 - Use of condoms: Always? Never? Sometimes?
- Implement or strengthen education of 9 to 11 year old boys on health and sexuality.
- Speed up the implementation and roll out of “Adolescent Friendly Health Services”.
- Provide continuing education for health workers on confidentiality and special aspects of young people’s sexuality and health needs to improve services and the relation between health workers and young clients / patients.
- Introduce disciplinary measures to be taken against health workers who breach professional ethics, e.g. by violating key rules of confidentiality. Regular on-site supervision is needed for enforcement of these measures.

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