

**PREDICTORS OF HIV/AIDS RELATED SEXUAL BEHAVIOR
OF HIGH SCHOOL ADOLESCENTS BASED ON THE
CLASSICAL HEALTH BEHAVIOR MODELS,
JIMMA TOWN, SOUTHWEST ETHIOPIA.**



BY: EYOB LEMMA, MD.

DECEMBER 2000

ADDIS ABABA

**ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES**

**Predictors of HIV/AIDS Related Sexual Behaviors among High School Adolescents
Based on the Classical Health Behavior Models, Jimma Town, South West Ethiopia**

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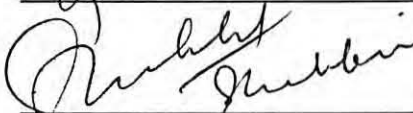
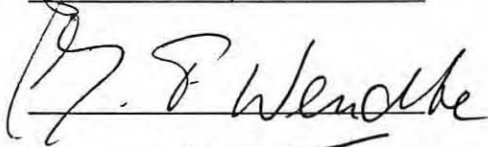
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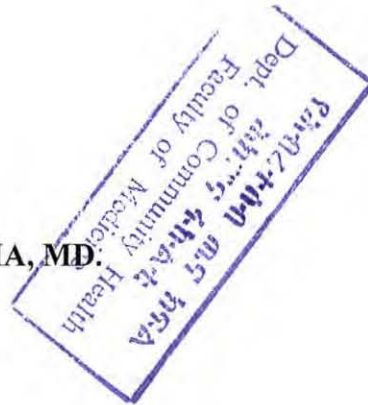





DEDICATION

I would like to dedicate this work for those individuals living with HIV/AIDS and who committed themselves to work in prevention campaigns in an attempt of saving the coming generation through awareness building.

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ABSTRACT

There is an understanding that effective HIV/AIDS prevention programs should be based on the models and theories of behavior change so that the programs can be designed to change those factors which lead to the undesirable risk behaviors and maintain the desirable once. With the objectives of determining HIV/AIDS related sexual behaviors and assessing their relation with variables derived from the classical models of health behavior, a study using a pre-tested self-administered questionnaire to collect information from a random sample of six hundred and sixty high school students was conducted in Jimma town on March 2000. Among the high school students 6.7% of female students and 11.2% of male students were found to have involved in sexual activity with worst lifetime sexual behavior index. Of the sexually active students the rate of unprotected sexual intercourse and intercourse with more than one sexual partner in the past year were 81.7% and 19.3%, respectively.

There is a significant gender difference in HIV-related risk sexual act and belief-intention factors. Higher proportions of males were involved in these high-risk sexual acts. Independent and significant predictors of intention to limit sexual partners were perceived barriers and normative belief for female students and normative belief and perceived behavioral control for male students. On the other hand, knowing an individual who has/had HIV/AIDS, motivation to comply, normative belief, and perceived behavioral control for females; while only perceived susceptibility and perceived behavioral control for males independently and significantly predicted the intention to use condom in the next sexual intercourse. It was concluded that high school students are at risk of HIV infection because of the high-risk behaviors they have. Patterns of gender difference are found and theory-driven and gender appropriate educational interventions and researches are recommended.

LIST OF ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
ANOVA	Analysis Of Variance
ARRM	AIDS Risk Reduction Model
CSW	Commercial Sex Workers
HBM	Health Belief Model
HIV	Human Immunodeficiency Virus
IEC	Information, Education and Communication
KABP	Knowledge - Attitude - Behavior - Practice
MANOVA	Multivariate Analysis Of Variance
MCH	Maternal and Child Health
MOH	Ministry Of Health, Ethiopia
NGO	Non-Governmental Organization
OR	Odds Ratio
PBC	Perceived Behavioral Control
PHC	Primary Health Care
PRECEDE	Predisposing, Reinforcing and Enabling Constructs in Educational/Environmental Diagnosis and Evaluation
PSE	Perceived Self Efficacy
SCT	Social Cognitive Theory
SD	Standard Deviation
SE	Self Efficacy
SPSS	Statistical Package for Social Scientists
STI	Sexually Transmitted Infections
TPB	Theory of Planned behavior
TRA	Theory of Reasoned Action
TV	Television
UNAIDS	Joint United Nations Programme on HIV/AIDS

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INTRODUCTION

Currently, acquired immunodeficiency syndrome (AIDS) is a priority health problem worldwide, with an estimated 34.3 million individuals living with HIV/AIDS as of end 1999 (1). The majority (68%) are found in the sub-Saharan Africa. The Ethiopian Ministry of Health (MOH) estimated that by 1997, the prevalence of human Immunodeficiency virus (HIV) infection in the country among adult population could reach 9% and the total number of adults and children infected reach 2.5 million (2). In the absence of an immunization or cure for AIDS, preventive activities include screening of the blood and modification of the transmissive behaviors, principally sexual behaviors and various forms of blood contact.

The modes of transmission of HIV are well known. There is also enough knowledge drawn from estimates about the magnitude of the disease. Yet, there is still a gap in relation to empirical knowledge about the distribution of these risk and preventive HIV/AIDS related behaviors in the population in general and in adolescents in particular. There is also little knowledge about the belief, value system, and traditions, which motivate and rationalize these behaviors. The behaviors in question are emotionally deep, habitual if not addictive, often stigmatized, personal, private, and in some cases illegal. Efforts directed at containing the spread of HIV must be accomplished by gaining an understanding of these behaviors. The need to understand behaviors and psychological dimension of the disease transmission has also been widely acknowledged (3).

Attention to adolescent population was warranted due to the several characteristics of this group, which put them at increased risk of health problems including HIV infection. Few of these characteristics are: the tendency of adolescents to involve in experimentation and exploration; the

tendency of perceiving themselves as invulnerable and engaging in several risk taking activities such as sexual and drug-use. The distribution of AIDS in the general population also tells us that the peak age of cases to be 20 - 29 years for females and 20 - 39 years for males indicating the peak age of infection to be the age of adolescence (2). Therefore, any intervention aiming at reducing the spread of infection should target these at risk adolescents of which the high school students are part. In addition, better understanding of their behavior, especially sexual risk and preventive behaviors need to be assessed and be used for designing health education and promotion programs.

Some knowledge-attitude-behavior-practice (KABP) studies have been conducted in the past, which attempted to assess the AIDS risk and preventive behaviors among adolescents, both in the rural and urban Ethiopia (4-7). These studies indicated there was a high prevalence of the risk behaviors and recommended that information regarding such risk behaviors need to be included in the high school curriculum and/or health education sessions along with wide availability and promotion of condom use. But, the questions to bring up with the available knowledge would be: What characteristics of individuals and community do we have to know to change AIDS related risk behavior? Beyond the provision of information about risk, what must be done to effect the reduction of AIDS risk behavior? What are the effects of relevant others on behavior change?

A greater understanding of the determinants of risk-related and preventive behaviors in target populations is an important precursor to the development of successful AIDS prevention programs (8). Previous studies among teenagers focused on transmission of knowledge, perceptions of risk and to a lesser extent on behavior. None of the studies have offered a

theoretical framework for understanding the psychological factors associated with risk of HIV infection and AIDS for this age group (9).

So far, several models of health promotion interventions have been developed to predict motivators of health behavior change. Of these most advocated are the Health Belief Model (HBM), Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB), Social Cognitive Theory (SCT), PRECEDE model, and others (10-15). In addition, the AIDS Risk Reduction Model is specifically applied for AIDS (16-17). These theoretical models have been advanced to predict involvement in a variety of preventive actions. Constructs derived from several models have been applied theoretically and empirically to risky and preventive behaviors, even specifically to AIDS (8,9,18-25). And therefore, some of these models were selected for this study to show what constructs are important in predicting these behaviors among adolescents and need to be considered in designing health education intervention for high school students.

The purpose of this study is therefore to assess predictors of preventive sexual behaviors as applied to HIV/AIDS among high school adolescents of Jimma Town and in relation to the theoretical constructs from the health behavior models and source of information. The high-risk sexual behaviors of the study participants are discussed. Predictors of intention to involve oneself in safe-sex are indicated in the study. With the understanding of predictors of AIDS preventive sexual behaviors, the study findings will help to direct the design and preparation of information, education and communication (IEC) materials for this specific group of the population. It is also believed that the study will initiate the use of models along with the empirical knowledge of risk behaviors in the planning, implementation and evaluation of behavior modification interventions.

REVIEW OF LITERATURE

2.1. The Global Picture of AIDS and AIDS Awareness

Joint United Nations Programme on HIV/AIDS (UNAIDS) estimates that 5.6 million people became infected with HIV during 1999; and overall 34.3 million people were HIV-positive as of end 1999 (1). So far efforts to slow down the spread of HIV by changing sexual behavior was largely limited to messages and promotion of condoms with particular attention to special risk groups such as commercial sex workers (CSW) and drug users.

Globally the level of awareness regarding AIDS is high. A study from Zaire indicated that 99% of men and 96% of women reported to have heard about AIDS. But still majority of respondents, i.e. 95% of men and 85% of women want to learn more about the disease (26). The problem with such kind of population from less developed nations is that there is also high proportion of misconception about the disease (26). Mostly multiple media channels were mentioned as a source of AIDS information. The most frequently cited source of information is the radio followed by the other channels (26,27). But, lower proportion for brochures, newspaper article or posters on AIDS. This may not be impressive especially in less developed countries where few people are able to read, where there is low availability of and high cost for the newspapers in the rural community. The above studies also showed that knowledge about AIDS is correlated with the number of media channels, indicating the multimedia effect of anti-AIDS messages (26,27).

Condom use is a very important characteristic in relation to the transmission of HIV infection in the population. The degree of awareness about condoms, attitude towards it and social and cultural barriers of its' use varies from community to community and between different age

groups. One study in France indicated 50.7% of the 18-29 years old people reported that they have used condoms. Condom use in this population was found to be associated with voluntary testing for HIV, fear of sexually transmitted infections (STIs), and knowledge of HIV carrier in personal relations (28). The criticism of the social and cultural image of condoms with potential effects on individual relationships were more frequently expressed as major factor affecting condom use. On the other hand, nonusers expressed more doubts about effectiveness of condoms to protect against transmission of HIV and other STIs, indicating a lot need to be done in modifying this barrier (28).

As described above, the fear of contracting STIs is a predictor of use of condom more than AIDS or unwanted pregnancy. The implication of such results is that the importance of fear of STIs as a predictor for condom use suggests that it may be useful to include information about condoms in the general context of STIs rather than to only associate them with prevention of HIV infection. However, the most important aspect of general information about condoms may be to change their social image and to promote them as a normal role in sexual and affective relationships (28).

2.2. The Situation in Ethiopia

According to the MOH estimate, the prevalence of adult HIV in 1997 was 7.4% (24% in the urban and 4.5% in the rural communities) indicating a total estimated number of 2.5 million adult and children infected with HIV (2). The most common mode of transmission identified was heterosexual contact. Other lower in magnitude but important modes of transmission were perinatal, blood transfusion, harmful indigenous practices and unsafe injections (2,29). Ninety percent of reported AIDS cases occur among adults between 20 and 49 years i.e., the most

economically productive group. Roughly equal proportions of male and female were reported.

The absence of many AIDS cases was also observed in the age group 5 - 14 years (Window of Hope) ruling out the falsely believed modes of transmission. Once children passed this "*Window of Hope*" period the rate of infection increases markedly (2,30). The implication of which is any intervention directed at reducing HIV/AIDS cases must aim at changing the behavior of these children to prevent them from being infected. Changing behavior (avoid risk and maintaining preventive) is way of ensuring these children to remain free of infection for the rest of their life.

Based on the available prevention measures the disease will remain a major public health problem in Ethiopia. Currently, the trend of HIV infection is on the increase. Projections made by the MOH showed that the prevalence will increase to 9% by the year 2000. There will be 4.7 million infected people by the year 2014, hospital bed utilization for AIDS cases will increase to 57% by 2001, and there will also be an increased impact on the development and social sectors (2,31). With the understanding of the pressing needs the national HIV/AIDS control program was established in 1987 under the MOH. And to coordinate the efforts by the different sectors the national policy on HIV/ AIDS was proclaimed in 1998, with the goal of providing an enabling environment for the prevention and control of HIV and AIDS in the country (29).

2.3. Behaviors Towards Unsafe Sexual Activities and HIV/AIDS Preventions

2.3.1. *The Challenge*

In response to the AIDS epidemic in the early 1980 there was an up source of research on sexual behavior. The major modes of spread of HIV infection incriminated were sexual intercourse, sharing needles, perinatal transmission and blood transfusion. It is also important to note the

prevailing misconceptions on the various modes of transmission. These modes, be it the correct ones or the misconceived ones, are associated with the behavior of the individual, the group and/or the community (3). Therefore, apart from the understanding of natural history of the disease, factors influencing prevention of disease transmission asks for the understanding of the current beliefs about HIV/AIDS, in the social and cultural context

One problem with AIDS prevention is the understanding of the population's current beliefs concerning HIV and AIDS. The declining trends of HIV-1 prevalence (1991-1997) observed in some countries, was associated with the corresponding reduction in HIV-1 attributable changes in behavior (32,33). However, because of the long period of time between HIV infection and the clinical signs of AIDS, risky behaviors are not easily perceived as associated with HIV infection, making the change in behavior a difficult undertaking. The understanding of HIV and related behaviors clearly far from complete, especially in the youngest age groups where there is most evidence of change. It is recommended that sentinel and behavioral surveillance be expanded to look at these younger age groups (34-36).

2.3.2 Adolescence AIDS and Sexual Behaviors

For HIV/AIDS prevention, adolescents are targeted because they are just beginning to face social situation in which their own decisions and action will determine their exposure. The AIDS related sexual behaviors which were identified to pose risk of infection among this group of population are: premarital sex and casual sex including CSW, non-use of condom, multiple sexual partners or individuals whose partners have multiple sexual partners and STIs.

Most adolescents commence sexual intercourse at early age. This most likely will occur with casual partner and will also increase the number of lifetime partners. Ismail et al (1997) and Fantahun et al (1995) found most high school adolescents start sexual activity at the age of less than 18 years (4,37). In areas of high seroprevalence, infection will most likely occur in adolescence with early sexual exposure. In addition in one of the studies 19.4% of male students had sexual encounter with CSWs (37).

In the developing world, a significant relationship was found between the high prevalence of premarital sex among youths (15-24 years) and the prevalence of non-regular sex among adult of both sexes, indicating consistency in social controls of behavior from adolescent to adulthood. Younger age and unmarried status emerged as net predictors of risk behavior in 8 of the 12 sex-specific study grouping (38).

Reported condom use by sexually active students is generally low compared to the level of knowledge about the disease and about the benefits of condoms (5,26,37). The reasons for not using condom by these students include pressure from sexual partner, effect on sexual pleasure, fear, carelessness and slipping off during intercourse (6,26). With the presence of low condom use rate the sexual intercourse with multiple partners is also found to be high in this age group of the population. In one study in the US, 4% of students reported having had an STI and among currently sexually active students only 49.4% of male students and 40.0% females reported that they or their partner used condom during the last sexual intercourse (39). Among a sample of 10th graders in the USA, 67.3% reported having had unprotected intercourse with low risk partner and 1.3% reported unprotected intercourse with high-risk sexual partner(s) in the past year (8).

With effort of health education and promotion interventions there are changes seen in some African countries. The increase in age of first sexual intercourse, the increase in condom use and the high proportion of the population ever using condom indicated the successes in line with the interventions directed at changing sexual risk behavior (32). The effect of high mortality and morbidity, which affected most of the households, may also explain the most obvious changes in condom use behavior in these countries (33,34).

2.4. The role of Health behavior theories and models in explaining sexual behaviors

2.4.1. *Health Behavior Theories and Models: Overview*

Theory is a set of interrelated constructs (concepts), definitions, and propositions that present a systematic view of phenomena by specifying relations among variables, with the purpose of explaining and predicting the phenomena (11). It is a systematic arrangement of fundamental principles that provide basis for explaining certain happenings of life. In comparison, a model is referred as a sub class of a theory. It provides researchers with a plan for investigating the phenomenon (15). Based on this description, it seems logical to think of theories as the backbone of the process used to plan, implement, and evaluate health promotion interventions. Appropriate learning and behavioral theories can help to ensure congruence between the planned interventions and expected outcomes. Models provide the vehicle for applying the theories (15).

So far there are several models, which were designed to explain different health behaviors, of which few were predominantly used to understand and predict health-related behaviors. These include the Health Belief Model (HBM), Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB), Self Efficacy theory (SE), Predisposing Reinforcing and Enabling Constructs in

Educational/Environmental Diagnosis and Evaluation (PRECEDE) (10-15). These theories tried to explain behavior using constructs. Though theories give explanation for some health events, they are inadequate to explain events universally, making their application in some situations difficult. Moreover, there is difficulty in transferring theories from the academic training context to the practical environment. These are reasons for a very limited use of them by health educators (15).

The HBM with the dimensions of Perceived Susceptibility, Perceived severity, Perceived barriers, Perceived Benefits and Cues to action; tried to distinguish between who do and who do not adopt to HIV related preventive behavior. It has constructs, which have logic and are clearly amenable for intervention. For example, Buunk et al (1998) found that barriers to use condom are major predictors in their study (40). In addition they have found perceived susceptibility and benefits predict condom use. Therefore, the recommended strategy for intervention is clearly be linked to solving these barriers, building their benefits and making people feel susceptible.

The HBM though include important constructs and is relatively well studied, it is not without critique. The difference between safe sexual behavior and other health behavior predicted by the HBM have been noted (21). The model failed to address the inherent difference between these behaviors and the concern of maintaining the safe sex behavior for a longer period. In addition, the long duration between the HIV infection and development of AIDS resulted in lesser realization of susceptibility though there is maintained understanding of the severity. Because of these and other deficits, it is recommended that the HBM include components of social factors and self-efficacy (10,15). Self-efficacy is a concept of Social Cognitive Theory (SCT) defined as

"the conviction that one can successfully execute the behavior required to produce the outcomes". Some authors support the importance of self efficacy in helping to account for the initiation and maintenance of behaviors and others have suggested that the concept to be added to the HBM in order to enhance its explanatory power (13,20).

Though the HBM gives plausible basis for health education, the process involved in action regulation and the mechanisms by which belief and threat translated into action are poorly specified. The TRA, which proposed these mechanisms, receives empirical support for health behaviors including HIV-preventive safe sex (22,23,41). According to this model, a person's intention is a function of two basic determinants (attitude towards the behavior and subjective norms' i.e. social influence). Many studies showed that attitude predict intention to use condom (22,23). Attitude towards anticipated social embarrassment is also important (24). School based interventions on attitude and perceived norms were found to be good predictors of HIV-preventive intentions and behavior. The implication of which is that interventions could be based on this theory for the attitudinal and normative control of AIDS-preventive behavior.

Incorporating perceived behavioral control (TPB) to link intention and action has been shown to improve the predictive power of the model (22). Expectancy-value models like TPB are concerned only with the relations among cognitions, intentions, and behaviors; they have little to say about cognitions can be changed, and need to be supplemented by theories of attitude change. In addition, there are controversies as to the role of past behavior as a predictor. Some indicated that past behavior could be used to mimic its effect in the past (22). There is a clear gap between goal related intentions versus implementation intention. Goal of adolescents may be quite

different than preventing HIV. Most of the cases it is preventing unwanted pregnancy, which logically will be replaced by use of other contraceptives, if commitment in relation arrived by the partners.

The separate presentation of each model exaggerates the distinctions among them. It is likely that many of them or even all of them operate simultaneously. Program designers should not assume that separate presentation implies that just one must be accepted and acted upon. Each may provide insights that will help direct program design.

2.4.2. Empirical Findings

Studies conducted to test the health behavior models in the context of HIV/AIDS preventive behaviors or their intentions presented interesting findings. Some of the empirical findings indicated the efficiency of the different models and theories by assessing the predictive power of the constructs. The main findings of these studies are summarized below.

There are studies that have attempted to assess AIDS preventive behavior among adolescents based on the HBM. According to Hingson and colleagues (1990), except the perceived severity, the three constructs of the HBM were found to predict condom use among adolescents (42). From these again perceived barriers appeared to be the strongest predictor of all the dimensions of the model. Other studies also share the powerful predictive nature of the perceived barriers, but there is inconsistent result with the other constructs of the model (20,21,24).

Self-efficacy, a concept from the Social Cognitive Theory, has been proved to be powerful predictor of safe sex behavior specially the intention to use condom (8,20,25,41,43). There is a

clear link between the perceived self-efficacy and the skills needed to manage the risky behaviors that can lead to HIV infection. Examples of behaviors that can be affected by efficacy expectations include using condoms, negotiating sexual contacts, and drug use (8,43,44). According to the SCT past behavior affects self-efficacy, those who previously bought condoms are more efficacious to do it again than those who try and fail or those never tried. Recent studies have reported that people who practiced preventive behavior possess significantly higher self-efficacy than those practicing risk behaviors (8,12,41,43).

Perception of social or peer norms concerning the acceptability of safer sex practices is an important determinant of HIV risk-taking behavior. To the extent that individuals believe that condom use or other safer sex changes are expected, supported and likely to be reinforced within their peer network, they are more likely to conform to these perceived norms (45).

The relative importance of the TRA and TPB model components in predicting HIV-preventive behaviors is well documented and the models have been applied successfully to a range of HIV-preventive behavior domain and also different population groups (22,23,41). Studies on adolescents have shown that the effect of attitude exceeds that of subjective norm (23). There are also contradicting findings from other similar studies, which indicated subjective norm exceeded that of attitude in predicting intention to use condom (22). Generally the addition of perceived behavioral control has improved the performance of TRA model also in relation to intended condom use, this construct being the strongest predictor than the others in the model. The residual effect of past behavior upon behavioral intention including intention to use condom by adolescents has also been indicated (22).

2.4.3. Implication towards program design

Assume that knowledge turns into behavior when a perception of self-efficacy to perform that practice exists. For example, high school adolescents use condom with their partners more often when they both have the skills and believe they are more able to negotiate with their partners about such use. The needed intervention would be to train the audience (in this case, high school adolescents) in the skills of negotiating and, at the same time, develop their confidence that they can perform the behavior. In order to design such health education program that will be attended by those for whom it is intended, understanding the meaning of the health problem to those affected is essential. HIV prevention programs must take this dynamics into account.

Therefore, before planning for the design of behavioral change interventions, the understanding of the predictors of motivators in a specified group of the community is mandatory. Such information is deficient in the developing world. Furthermore, though there are some studies conducted in the US, the direct application of their finding to the less developed countries, including Africa will be erroneous (3).

To generate such information in the Ethiopian context, this study was conducted among high school adolescents of Jimma town. It tried to assess adolescents' high-risk sexual behavior and attempted to come up with important socio-psychological predictors of safe-sex behavior intentions, which planners can use in order to mount educational campaigns.

OBJECTIVES

3.1. General Objective

The general objective of the study was to assess predictors of HIV/AIDS related sexual behaviors that could be targeted for modification or reinforcement, respectively, in HIV/AIDS prevention programs directed at high school students.

3.2. Specific Objectives

- Determine the magnitude of HIV/AIDS related sexual risk and preventive behaviors among high school adolescents of Jimma Town.
- Determine the relation of these behaviors with the socio-demographic and knowledge variables
- Assess the correlates (predictors) of HIV/AIDS related safe sexual behavior intentions with variables derived from the constructs identified by the health behavior models (Health Belief Model, Theory of Reasoned Action, Theory of Planned Behavior, Self-Efficacy Theory and Social Cognitive Theory).

METHODOLOGY

4.1. Study area and period

The study was conducted in Jimma Town, Southwest Ethiopia. The data was collected on a single day in the two high schools of the town on March 2000. Before the main data collection semi-structured interview to generate variables for questionnaire development and pre-testing of the questionnaire were done on February the same year. The town is located 338 kilometers southwest of Addis Ababa in Jimma Zone, one of the eleven zones of Oromiya Regional State. The town has projected total population 112,404 for the mid 2000, of which 55,494 are males and 56,910 females. Considering the age distribution, in the town, adolescents in the 15 - 19 years age group accounted for 13.6 percent of the total. In addition, 9.8% of the total were between the age 20 and 24 years. The estimated proportions of females in the above mentioned age groups are 54.1% and 53.2%, respectively (46).

According to the 1994 census result the religious composition of the population of Urban Oromiya region indicates that 67.8% were Orthodox Christians, 24.0% were Muslims, and 7.0% were Protestants (46). Similarly in the Urban Oromiya, the proportion of Oromos is 54.4% and that of Amharas is 28.8%. Guragies constitute 8.1% of the population. The results also showed that 68% of the urban Oromiya population to be literate. The estimated total fertility rate for the same population was 3.5 and the estimated expectation of life at birth for urban males and females was 53.6 years and 57.2 years respectively (46).

Jimma town has three woredas and 21 kebeles. There is pipe water, electricity, land and air transportation, and telephone services in the town. Additional communication facilities regularly

available are radio, newspapers, and television. Regarding the health services, the town has one teaching hospital that serves as a referral center. In addition there is one teaching health center and one maternal and child health (MCH) clinic, which provide an integrated primary health care (PHC) service for the town population. The Hospital and the Health Centers also serve as training centers of health professionals from the Jimma University. Like any other part of the region and the country, the major causes of morbidity and mortality are communicable diseases. Though there is no adequate information on the prevalence and spread of HIV/AIDS in the town, cases of AIDS has increased from the previous years.

Oromiya region is known for the production of coffee and in Jimma town there is high movement of merchants and daily laborers especially during the coffee-harvesting season. For this reason and others there are several nightclubs and CSWs in this town, which indicate the possibility of speedy spread of HIV/AIDS.

In the town there are two high schools with a total of 6,749 enrolled students from grade 9 through 12. There are anti-AIDS activities conducted by the communities of these high schools, especially through anti-AIDS clubs. These anti-AIDS club activities of the high schools are currently supported by two non-governmental organizations (NGOs). In addition there is a regular school health activities conducted by team of final year health professional students of Jimma University during their team-training program. The success of these activities however, is not properly evaluated yet.

4.2 Study Design

The study was a cross-sectional study.

4.3. Study Population and Sampling

4.3.1. Population

The source population was all high school students of Jimma town who were enrolled in grades 9 through 12 for the 1999/2000 academic year. From these a random sample of 660 students was selected using the class name list of all the grades and sections.

4.3.2. Sample size

To determine the sample size for the study the following assumptions were made. Precision to an acceptable approximation of the population was taken to be 95% ($Z^2_{\alpha/2} = 1.96$). A 4% margin of error ($d = 0.04$) and a proportion of 50% of high-risk behaviors among adolescents were preferred to get the largest possible sample size ($p = q = 0.5$). Furthermore, additional 20% allowance for possible absenteeism and refusal to participate in the study was considered based on the findings from previous school based studies. With these and taking the total population (N) of 6,749 the sample size was found to be 660.

$$n_0 = \frac{(Z_{\alpha/2})^2 \cdot p \cdot q}{d^2} = 600 \text{ and } n_f = \frac{n_0}{1 + n_0/N} = 550$$

Therefore, minimum sample size required for the study = $1.2n_f = 660$

4.3.3. Sampling technique

The list of all high school students in Jimma town was secured for use as a sampling frame. A list of students was prepared according to alphabetical order; first the name of the school then their

grade (ascending order) then the letter of the section (class) order and finally the name of the students. The list was then numbered from 0001 to 6749 in the ascending order. Following this a random number list of 660 numbers was generated using the Epi Info Version 6 statistical package. The name of the student, school, grade and section that correspond to the selected numbers were identified from the prepared list and were included for the study.

4.4. Procedures of Instrument Development and Data Collection

4.4.1. Questionnaire Development

The principal investigator developed a self-reporting questionnaire in English. A pool of questions, which can address the behavior and predictors of interest were made after extensive review of available relevant literatures (8,20,22,26,27,43,47,48). In order to enrich the questionnaire a total of seven semi-structured interviews were conducted in Jimma town among adolescents using trained peer interviewers (Appendix 1). The result of the semi-structured interviews helped in refining the questions and also in selecting the relevant behaviors and predictors, which are appropriate for the study community. In addition, information that was gathered through this preliminary qualitative approach in the survey area was used to identify gaps and redundancies in the prepared questionnaire, given local conditions, and to define critical terms in the local language, such as regular partners and casual partners.

The questions and statements then were grouped and arranged in to a five-point Likert's scale. The draft questionnaire was then given to two reviewers and they tried to group them according to the behavior it intended to measure and constructs intended to address. The difference, deficit, redundancy and vagueness were corrected accordingly. A sociologist then reviewed the draft

questionnaire and his comments were accommodated. No major change was made except to keep the logical flow of questioning which was agreed and corrected as recommended.

Two individuals who have very good language ability of both the Languages then translated the final English version of the questionnaire to Amharic. Differences between the two translations were discussed and some minor modifications (example Intention Vs think/plan/decide to) were made after referring the English-Amharic dictionary. The agreed Amharic version of the questionnaire was then translated back to English to see a gap in the content of the original and the second translation version of the questionnaire (49).

Before translation and the review the concerned individuals were informed about the aim and proposed method of the study. Finally, eight additional questions were added at the end for pre-testing in order to address issues related to the questionnaire and the way of questioning. In order to avoid confusion, due to the wording of statements in Amharic for the male and female, two types of questionnaires were prepared for the two groups.

4.4.2. Pre-testing

Pre-testing of the questionnaire was carried out at Agaro High School, which is located in a town 45 kilometers South of Jimma. Agaro town shares similar geographic and socio-demographic characteristics with Jimma Town. During the pre-testing, the questionnaire was assessed for its clarity, understandability, completeness, and reliability. The sensitivity of the subject matter and pattern of response were also assessed.

A total of 102 students (45 females and 57 males) were asked to participate in the pretest out of which two female students refused to participate. Generally, the pretest result was good in relation to the developed questionnaire. On average it took 42.05 minutes (range 34 to 67) minutes to finish the questionnaire. The frequencies of responses for the 8 questions are shown in Appendix 2. A total of 38 forms had one or more missing variables. The frequently asked questions by participants during the pretest were directed at how to mark their choice, difficulty in remembering the total number of sexual episodes and the total frequency of condom use during the past sexual intercourse episodes.

The pre-test data was analyzed after entering in to a computer using SPSS Data Entry II statistical package. Some previously overlooked but necessary skip patterns were identified. In addition, some compounded questions were also identified and correctly disaggregated. The data was analyzed for item analysis with reliability test. This approach was then utilized to test whether the scale used to measure the constructs can holdup in the specific population. In addition, attempts were made to reduce the number of questions used to measure a single construct. The attempt was aimed at reducing the number of questions, which measure a single construct, while keeping the reliability near to the original one. Those questions with high proportion of missing values were considered the first target for the removal trial (49). Finally, the following corrections were made on the questionnaire:

- Some questions, which were found to improve or maintain the reliability of the remaining questions upon removal, were removed
- Those questions like 'number of sexual partner', 'number of sexual episodes' and 'number of such episodes where condom was used' were converted into categorical

variables

- The flow of questioning was also arranged in such a way that questions which focuses on the same topic (behavior) were finished before jumping to another behavior. In the middle transition paragraphs were also added to smoothen the transition.
- Questions and statements were packaged (choices on the top) to facilitate easy and quick response.
- The method of marking choice were changed to circling choice number in the first part and putting right (✓) mark in the subsequent parts.
- The identified skip patterns were accordingly corrected in the questionnaire.
- Multiple response variables were transformed and treated as separate Yes/No question choices during data entry.

The final self-administered questionnaire was then prepared to have five parts (Appendix 3).

In addition to testing the instrument, the whole process of proposed method of administering the questionnaire (data collection) and data management was also assessed. The only exception to this fact is that the participants were not random sample of students. Though it was proposed to administer the questionnaire at the end of the first shift and beginning of the second, the director of the school convincingly criticized this. The inconvenience was that it would be difficult to select and gather students during their very first class period. Therefore, the questionnaire was administered at the middle of each shift.

4.4.3. Measurement Variables and Operational Definition

Socio-demographic characteristics: Sex, age, school grade, Ethnic/Religious group, parents' status of each student.

Sexual risk behavior and AIDS preventive behavior: past involvement in AIDS risk and preventive sexual behaviors including number and risk status of sexual partners, consistency of condom use during sexual intercourse, history of sex under the influence of alcohol and history of genital symptoms of STIs. A high-risk sexual partner was defined as one who was believed by the partner to have history of one or more of the following: sexual contact with multiple partners, sexual contact with CSW or one who had contact with a partner who had contact with CSW, casual partner (known for the respondent for less than three weeks), or partner who have history of STIs. An AIDS risk behavior index, ranging from lower to higher risk of acquiring infection with HIV, was created from these items and as modified from what was used by Walter et al, 1992 (8). Index scores ranged from 0 to 6; the definition of each risk level is presented in Appendix 4.

- ✓ *Source of AIDS information:* Ever heard of HIV/AIDS and the source of the information, whether the respondent learned of HIV/AIDS at school and know an individual with HIV/AIDS.

Constructs derived from the health belief model, social cognitive theory and self-efficacy: Perceived threat using three and two items respectively assessed susceptibility and severity of acquiring HIV/AIDS. In addition, perceived benefits and barriers, self-efficacy and relevant others in regard to engaging in AIDS-preventing behaviors (abstaining before marriage, limiting sexual partner to one / avoiding multiple sexual partner and condom use at the next sexual

intercourse) were evaluated. The number of items used and the internal consistency (α -coefficient) of these constructs were presented in Appendix 5.

Constructs derived from the theory of reasoned action and planned behavior: items, which address behavioral intention, attitudes and beliefs towards preventive behavior, and items, which assess subjective norms, were used in this study. Questions related to evaluation of the consequences, normative belief, and perceived behavioral control were also added. The number of items and their internal consistency for the three intentions is shown in Appendix 5.

- *AIDS related knowledge:* The students were asked to complete 13 items pertaining to transmission and prevention of HIV infection. In additions statements on the misconceptions of HIV transmission and prevention were included. The internal consistency (α -coefficient) of knowledge item was 0.60.

Behavioral intentions: Behavioral intentions were measured by means of items “I intend to ... (to abstain, limit sexual partner or use condom)”, each measured separately, using a five point Likert's scale. This scoring was subsequently reversed, so that the higher the score the stronger the intention to apply these behaviors, respectively.

Except for AIDS related knowledge, the questions for the constructs derived from the health behavior models were measured with a five point measurement scale ranging from 1 (very certain/very likely/strongly agree) to 5 (very uncertain/very unlikely/strongly disagree). This scoring was subsequently reversed, so that the higher the score the stronger the positive construct (example, Intention). The sums of the score for the items were used as a summary statistics to

measure the specific construct for the specific behavior. Finally, behavioral intentions were taken as dependent (outcome) measures/variables while the other constructs, socio-demographic variables, source of AIDS information, AIDS related knowledge and past sexual behavior were used as independent (exposure) variables/measures.

4.4.4. Data Collection

To facilitate data collection in each grade-sex group two facilitators of same sex were recruited from Jimma Zone and were trained for three days before and two days after the pretest. They were responsible for distributing questionnaires, discussing the purpose of the study and the importance of participants' honest and sincere reply, and responding to questions raised during filling the questions. The criteria used for selecting facilitators were fluency in Amharic, educational status of secondary school and above, age 18 - 24 years, previous experience, willingness to work with the research team, and performance during the five days training course.

The training of facilitators focused on introducing the aim and purpose of the study, the type of information needed to answer frequently asked questions, how to collect information and the methodology of this particular study in relation to reaching the intended goals. Furthermore, a two days orientation was given to the trainee on the questionnaire and their role during data collection after the pretest. Finally, trainees were allowed to fill the questionnaire by themselves and latter discuss on areas of difficulty. After the group discussion the principal investigator gave appropriate feedback.

On the day of data collection, the randomly selected students were told by their teachers (which were informed earlier) to remain in their class during the break time. The research coordinators, with the help of the unit leaders combined neighboring sections to form groups of single grade-sex students. Survey completion required duration of one class period for each shift. When finished, students were told to put their completed questionnaire in a box, which is located at the exit of each room. The overall activity of data collection was supervised and coordinated by the principal investigator and two other coordinators in each school.

4.5. Data management, analysis and interpretation

Data Coding: As it can be seen in the questionnaire almost all the variables are pre-categorized. The question number in the questionnaire identifies variables and appropriate variable name was given. End coding (the use of the right margin for writing the code) was employed. The data was entered using SPSS Data Entry II package. The choice number was used as the code number in the first part and the score 1 to 4 or five was given to the choices in part three and four (scores for some of the statements were subsequently reversed).

Data Entry and Verification: The layout scheme was developed and the codes for each variable have been specified. Following this, two individuals who have expertise in data entry using SPSS entered the data at Jimma. Range and skip checks were done automatically during data entry. Another random sample (20%) of the data was re-entered and printout was visually compared with the original data. Errors identified were corrected based on the original record.

Data Cleaning: Computer printouts of frequencies were used to check for outliers. Logical and

consistency errors were checked after completing data entry. Any errors identified at this stage were corrected after revision of the original questionnaire, retrieved using the record number. After the data was cleaned backup copies were made and stored in a safe place along with the codebook.

Data Transformation: All the constructs were formed after transforming the raw data variables as shown in Appendix 6. Summations of the score of the questions were used as summary statistics for the predictor constructs.

Data Analysis: Frequencies, proportions and summary statistics (mean, median, mode, range and SD) were used to describe the study population in relation to relevant variables. Contingency table analysis of the association between the outcome variable and possible risk factors was carried out. The χ^2 test was used for analysis of proportions and Pearson correlation coefficient for continuous variables. Cronbach's α was used to test reliability of the items used to measure each construct. To examine the presence of group differences (gender) in the potential risk, predictor constructs and also outcome indicators ANOVA and MANOVA were applied. Multiple Logistic regression analyses were performed with the significantly correlated predictors on the bivariate analysis. Multiple logistic regression analysis was used to determine the individual contribution of potential predictors of sexual behavior (demographic variables, HIV/AIDS knowledge and theoretical constructs derived from the health behavior models) on the outcome variables: AIDS related safe sex intentions. For this purpose the predictors were dichotomized in such a way that the top two fifth Vs the lower three fifth. For the multivariate logistic regression those variables, which has bivariate relation with the outcome variable, were entered along with

logically relevant variables. Furthermore, not to miss important predictors those with $p < 0.25$ on bivariate analysis also entered in the multivariate model.

4.6. Ethical considerations

Response to the survey was anonymous. A letter with introduction of the study, the need and benefits of conducting the study, method of questioning and confidentiality was attached to the cover page of the questionnaire (Appendix 3). In addition, participants were informed why consent is needed for researches. Facilitators also discussed the content of this letter before the participants start to fill the questionnaires. Participants were also informed that they have full right to discontinue or refuse to participate in the study. A formal letter was written to the Jimma Zone Education Department. The schools' willingness to participate in the study was discussed with officials of the high schools. Moreover, the study proposal had clearance from the ethical committees of the Department of Community Health and School of Graduate Studies, Addis Ababa University.

RESULT

5.1. Demographic Characteristics of The Study Population

Out of 660 randomly selected students, 590 participated in the study (response rate of 89.4%). From the 590 participants, 304 (52.2%) were females and 440 (86.1%) were in the age group 15 to 19 years. The mean ($\pm$ SD) and median age for the study population were found to be 16.77 ($\pm$ 1.86) and 17 years, respectively. Regarding their religion, majority 412 (70.4%) were Christians and 173 (29.6%) were Muslims. Two hundred twenty eight (39.0%) of the students were Oromos, 147 (25.2%) were Amharas, 32 (5.5%) Keffa & another 31 (5.3%) were Dawro by their Ethnicity (Table 1). Seventeen (3.0%) of the respondents are currently married of which 16 (94.1%) are females. Generally, majority (96.9%) of the students reported that one of their parents is currently alive, 488 (84.1%) for the father and 506 (91.3) their mother is alive. In addition, the mean and median family sizes of respondents were found to be 6.89 and 7 persons, respectively.

5.2. Sexual Behavior Of Study Participants

5.2.1. Onset of Sexuality Activity

More than one-fourth, 163 (27.8%) of the sample of high school students reported to have sexual intercourse in the past. Higher proportion of males 104 (36.9%) had past history of sexual act than females 59 (19.3%) [$\chi^2_c=21.6$, $p<0.001$] (Table 2). The reported mean ($\pm$ SD) age at the first sexual intercourse was found to be 15.03 ($\pm$ 3.52). Female students reported sexual debut at latter age than male students ($F(1,142)=10.2$, $p<0.01$).

Table 1: Distribution of high school students of Jimma town by their demographic characteristics, March 2000.

Variable		Female n (%)	Male n (%)	Total n (%)
Sex:		304 (52.2)	278 (47.8)	-
Age:	≤ 16	123 (46.4)	97 (39.4)	220 (43.1)
	> 16	142 (53.6)	149 (60.6)	291 (56.9)
School:	Jeren	111 (37.9)	115 (41.4)	226 (39.6)
	Jimma	182 (62.1)	163 (58.6)	345 (60.4)
Education:				
	Grade 9	98 (32.2)	99 (35.2)	197 (33.7)
	Grade 10	88 (29.0)	70 (24.9)	158 (27.0)
	Grade 11	93 (30.6)	82 (29.2)	175 (29.9)
	Grade 12	25 (8.2)	30 (10.7)	55 (9.4)
Religion:				
	Muslim	88 (29.0)	85 (30.1)	173 (29.6)
	Christians	215 (71.0)	197 (69.9)	412 (70.4)
Ethnicity:				
	Oromo	111 (36.6)	117 (41.6)	228 (39.0)
	Amhara	83 (27.4)	64 (22.8)	147 (25.2)
	Other	109 (36.0)	100 (35.6)	209 (35.8)
Currently Married:	Yes	16 (5.3)	1 (0.4)	17 (3.0)
	No	284 (94.7)	274 (99.6)	558 (97.0)
Father Currently Alive:				
	Yes	255 (84.4)	225 (83.8)	488 (84.1)
	No	47 (15.6)	45 (16.2)	92 (15.9)
Mother Currently Alive:				
	Yes	264 (94.0)	242 (88.6)	506 (91.3)
	No	17 (6.0)	31 (11.4)	48 (8.7)

Table 2: Factors related to sexual behavior of sexually active high school students of Jimma town, March 2000.

Factor		Female n (%)	Male n (%)	Total n (%)
Sexually Active:	Yes	59 (19.3)	104 (36.9)	163 (27.8)
	No	246 (80.7)	178 (63.1)	424 (72.2)
Lifetime sexual partner:				
	One	41 (75.9)	61 (62.9)	102 (67.5)
	2 to 5	10 (18.5)	22 (22.7)	32 (21.2)
	> 5	3 (5.6)	14 (14.4)	14 (11.3)
Frequency of condom use:				
	Never used	28 (51.9)	56 (56.6)	84 (54.9)
	Occasionally	17 (31.5)	15 (15.2)	32 (20.9)
	Most of the time	3 (5.6)	7 (7.1)	10 (6.5)
	Always	6 (11.1)	21 (21.2)	27 (17.6)
Had genital symptoms of STIs:				
	Yes	6 (10.5)	10 (9.8)	16 (10.1)
	No	51 (89.5)	92 (90.2)	143 (89.9)
Sexual contact with high risk partner: (n=148)		20 (38.5)	38 (39.6)	58 (39.2)
	Casual partner (n=155)	8 (14.3)	22 (22.2)	30 (19.4)
	Who had multiple partners (n=154)	12 (21.8)	16 (16.2)	28 (18.2)
	Who had STI (n=155)	6 (11.1)	8 (7.9)	14 (9.0)
	CSW/Who had contact with CSW	9 (17.0)	14 (14.6)	23 (15.4)
Had sex after consuming alcohol:				
	Yes	10 (17.9)	13 (12.7)	23 (14.6)
	No	46 (82.1)	89 (87.3)	135 (85.4)
SEXUAL ACT PAST YEAR (n=161)		39 (67.2)	58 (56.3)	97 (60.2)
	Multiple sexual partners (n=93)	6 (15.8)	13 (23.6)	19 (19.3)
	Inconsistent condom use (n=93)	32 (86.5)	44 (78.6)	76 (81.7)

As it is shown in table 2, 102 (67.5%) of the sexually active students reported only one sexual partner in the past. The rate of having more than one lifetime sexual partner is higher for male students (37.1%) compared to females (24.1%). There is a significant negative correlation between age at first sexual intercourse and number of lifetime sexual partners ($r = -0.15$, $p < 0.05$).

5.2.2. High Risk Sexual Behavior in the Past

Considering reported lifetime sexual behavior of sexually active students, only 27 (17.6%) consistently used condom during their sexual intercourse episodes. On the other hand, majority, 84 (54.9%) never used condom during sexual intercourse. Regarding history of STIs, small group of the sexually active students reported having history of genital symptoms of STIs in the past. Furthermore, 23 (14.6%) reported having sex under the influence of alcohol (Table 2).

Risk status of sexual partners was also assessed as perceived by the respondents. Among sexually active students, 58 (39.2%) had history of sexual contact with partner(s) presumed to have one or more risk factors for HIV/AIDS. Higher proportion of male students reported sexual intercourse with high-risk partner compared to female students (Table 2). Taking the reported sexual activity in the past an AIDS risk Behavior index was prepared (Table 3). Majority reported sexual abstinence or not involving in sexual intercourse in the past. The proportion of males with the worst score (category 5 & 6) was higher when compared to female students. Furthermore, majority of females categorized as having the lowest risk score (category 0) compared to males.

5.2.3. Sexual Behavior In The Past One Year

Participants were also asked if they had sexual intercourse in the past one year. Among the total participants, 97 (16.4%) reported as having sexual act in the past twelve months. This accounted for 60.2% of the sexually active student. Among those who had sexual intercourse in the past one year 39 (40.2%) were females and 58 (59.8%) were males. The distribution of the potential risk factors for HIV infection in past years' sexual act was also assessed. As shown in table 2, 19 (19.3%) of those who had sexual intercourse in the past twelve months had had more than one sexual partner, and majority 76 (81.7%) didn't use or inconsistently used condom during their sexual intercourse episodes.

5.3. Source of Information on HIV/AIDS

Almost all of the respondents (99.6%) have heard about HIV/AIDS. The most commonly cited sources of HIV/AIDS information were schools, television and radio in that order. Again 492 (90.3%) reported, that they learnt about HIV/AIDS at school. Three hundred and sixty one (66.1%), reported that they have seen or know person infected with HIV and/or AIDS patient. When asked about the cost of three condoms only one third (36.1%; 20.2% of females and 52.0% males; $\chi^2_c=56.76$, $p<0.0001$) of the students responded it to be less than half Ethiopian Birr (Table 4).

Table 3: Proportions of high school students of Jimma town by each category of AIDS Risk Behavior Index for their lifetime sexual activity, March 2000.

VARIABLE SCORE	Lifetime sexual behaviour		
	MALE n (%)	FEMALE n (%)	TOTAL n (%)
CATEGORY 0: Sexual abstinence	178 (66.7)	246 (82.8)	424 (75.2)
CATEGORY 1: Sexual intercourse consistently using condom with one low risk partner	5 (1.9)	3 (1.0)	8 (1.4)
CATEGORY 2: Sexual intercourse consistently using condom with two or more low-risk partner	2 (0.7)	1 (0.3)	3 (0.5)
CATEGORY 3: Sexual intercourse with one low risk partner with out or inconsistently using condom	29 (10.9)	23 (7.7)	52 (9.2)
CATEGORY 4: Sexual intercourse with two or more low risk partner with out or inconsistently using condom	13 (4.9)	2 (0.7)	15(2.7)
CATEGORY 5: Sexual intercourse consistently using condom with one or more high risk partners	10 (3.7)	2 (0.7)	12 (2.1)
CATEGORY 6: Sexual intercourse with one or more high- risk partners without or inconsistently using condom or history of sexually transmitted disease.	30 (11.2)	20 (6.7)	50 (8.9)

Table 4: HIV/AIDS related information and reported source by high school students of Jimma Town. March 2000.

Information/source	Female (n=274)	Male (n=272)	Total (n=546)
Heard about HIV/AIDS:	273 (99.6%)	271 (99.6%)	544 (99.6%)
Source of HIV/AIDS information:			
Family	102 (37.2%)	75 (27.6%)	177 (32.4%)
Church/Mosque	71 (25.9%)	54 (19.9%)	125 (22.9%)
Health institution	125 (45.6%)	168 (61.8%)	293 (53.7%)
Neighbors	47 (17.2%)	40 (14.7%)	87 (15.9%)
Theater/Cinema	49 (17.9%)	63 (23.2%)	112 (20.5%)
School	164 (59.9%)	185 (68.0%)	349 (63.9%)
Friends	77 (28.1%)	94 (34.6%)	171 (31.3%)
Posters/Pamphlets	54 (19.7%)	84 (30.9%)	138 (25.3%)
Radio	150 (54.7%)	161 (59.2%)	311 (57.0%)
Television	150 (54.7%)	167 (61.4%)	317 (58.1%)
Newspaper	88 (32.1%)	131 (48.2%)	219 (40.1%)
Have been taught at school about HIV/AIDS:	246 (90.4%)	246 (90.1%)	492 (90.3%)
Know individual with HIV/AIDS:	195 (71.0%)	166 (61.2%)	361 (66.1%)
Know source of Condom:	258 (93.8%)	207 (97.5%)	528 (95.7%)
Reported cost of three condoms:			
Don't correctly know	183 (69.6%)	98 (37.3%)	281 (53.4%)
< 50 cents	53 (20.2%)	137 (52.1%)	190 (36.1%)
0.50 to 1.00 Birr	24 (9.1%)	26 (9.9%)	50 (9.5%)
> 1.00 Birr	3 (1.1%)	2 (0.8%)	5 (1.0%)

5.4. Difference In Risk Factors, Predictors And Outcomes By Gender

Before conducting the major analysis, it was first examined if it was appropriate to analyze the data for the sample as a whole. Therefore, it was tested whether the presence of risk factors, predictor variables and intentions differ between gender subgroups in the sample. First, it was examined whether there were gender differences in the potential sexual risk factors for HIV infection. A MANOVA using gender as the independent variable and the indicators of the potential risk factors as dependent variables, revealed a significant main effect ($F_{(9,117)}=2.30$, $p<0.05$). However, there were only two significant univariate effects. These were, age at first sexual intercourse and the number of life time sexual partners ($F_{(1,125)}=9.57$, $p<0.01$; Means: female=16.39 and males=14.50) and ($F_{(1,125)}=5.60$, $p<0.05$; Means: female=1.26 and males=1.56), respectively.

Male and female students did not only differ in potential risk factors, but also in the outcome variables i.e. their intention to use condom at the next sexual intercourse ($F_{(1,518)}=23.78$, $p<0.001$), the mean ($\pm$ SD) for females and males were $3.54(\pm 1.19)$ and $4.05(\pm 1.10)$, respectively. This mean difference was not significant for the intention to limit the number of sexual partner to one. In addition, there were a number of gender differences in the predictor constructs. A MANOVA using gender as independent variable and the predictor variables for each outcome as the dependent variables resulted in a highly significant main effect, ($F_{(10,503)}=8.32$, $p<0.001$) for the intention to limit the number of sexual partner to only one and ($F_{(1,518)}=23.78$, $p<0.001$) for the intention to use condom at the next sexual intercourse.

Table 5 presents the mean scores and standard deviations for all predictor variables, and shows the univariate effect of gender. Female and male students differed on seven predictor constructs for each intention. As can be seen from the table, male students are more aware of HIV/AIDS, better motivated to comply with relevant others and felt that they are more at risk for HIV infection. On the other hand, females were more concerned about the barriers towards limiting the number of sexual partners but also had the perceive efficacy to do it more than male students. In addition to this, male students perceive more the benefits of limiting the number of sexual partners and their control over performing the behavior than female students. Similarly related to the condom use, male students were more convinced that condoms are beneficial when used, that other people expect them to use it and that they appraise they are able to use condom appropriately. On conclusion, based on the above findings it was decided to analyze the data separately for males and female students.

Table 5: Means and standard deviations for all predictor theoretical constructs by gender of high school students of Jimma town. March 2000.

High school students of Jimma town, March 2000.					
Variable	Female		Male		F
	Mean	SD	Mean	SD	
LIMIT TO ONE SEXUAL PARTNER:					
Knowledge	8.95	2.49	10.00	1.86	32.00***
Motivation to comply	16.49	6.04	18.08	5.63	10.22**
Perceived Severity	8.23	1.97	8.32	1.91	< 1
Perceived Susceptibility	9.82	2.34	10.67	2.27	19.04***
Perceived Barriers	10.55	3.12	9.72	3.20	9.61**
Perceived Benefits	12.27	3.22	12.98	3.11	7.08**
Perceived Behavioral Control	10.58	3.24	11.64	3.45	13.77***
Normative belief	14.83	3.00	15.11	3.26	1.11
Outcome Evaluation	22.33	4.81	22.84	4.02	1.86
Self Efficacy	12.64	4.25	11.08	4.54	17.45***
CONDOM USE:					
Knowledge	8.97	2.52	9.97	1.97	25.08***
Motivation to comply	16.66	5.78	18.10	5.53	8.21**
Perceived Severity	8.26	1.94	8.32	1.88	< 1
Perceived Susceptibility	9.83	2.30	10.68	2.27	18.02***
Perceived Barriers	9.55	2.71	9.39	3.38	< 1
Perceived Benefits	12.29	2.82	13.39	2.44	22.26***
Perceived Behavioral Control	16.98	4.60	18.45	4.65	12.87***
Normative belief	14.37	5.51	16.45	6.07	16.28***
Outcome Evaluation	20.80	4.17	20.73	3.42	< 1
Self Efficacy	6.81	2.03	7.47	2.07	13.33***

* $p < 0.05$, ** $p < 0.01$, and *** $p < 0.001$

5.5. Regression Of Intention On All Relevant Predictors: Logistic Regression Analysis

5.5.1 *Intention to limit sexual partner to one/remain monogamous*

Significant bivariate associations were observed between constructs (knowledge, perceived benefits of the behavior, perceived barriers to the behavior, normative belief, outcome evaluation and perceived behavioral control) and the intention to remain monogamous for female participants. In addition, the odds of intention among Christian was 2.14 times higher compared to Muslim students when it was adjusted for age. In the females, variables independently and significantly associated with the intention were barriers and normative belief. Controlling other variables the odds of having intention in female students with normative belief is 2.86 (95%CI=1.18,6.91) times higher compared to those with out the normative belief. Similarly, the odds of intenders among female students with low perceived barriers is 3.01 (95%CI=1.36,6.68) times higher compared to those with perceived barriers towards limiting the number of their sexual partners (Table 6).

On the other hand, among male study participants, perceived susceptibility, motivation to comply with relevant others, normative belief and perceived behavioral control were found to have a significant bivariate association with the intention to remain monogamous after adjusting for age. However, only normative belief (OR=3.34, 95%CI=1.39,8.01) and perceived behavioral control (OR=2.54, 95%CI=1.13,5.72) among male students were significantly and independently associated with the behavior in a multivariate analysis (Table 7).

5.5.2 Intention to use condom at the next sexual intercourse

As shown in table 8, from the theoretical constructs perceived susceptibility, motivation to comply, perceived barriers, perceived benefits, normative belief, self-efficacy and perceived behavioral control were found to be significantly associated on bivariate analysis among female students with the intention to use condom at the next sexual intercourse. Among female high school students variables, which are independently and positively associated with the intention to use condom at the next sexual intercourse, were motivation to comply (OR=2.31, 95%CI=1.06,2.05), normative belief (OR=3.13, 95%CI=1.30,3.54) and perceived behavioral control (OR=5.76, 95%CI=2.57,12.93). On the other hand, among female students cues to action (knowing an individual with HIV/AIDS) was found out to be independently and negatively associated with the intention to use condom at the next sexual intercourse (Table 8).

On the other hand, among male students, except knowledge and outcome evaluation all the remaining theoretical constructs were significantly associated with the behavior (Table 9). Among male high school students only perceived susceptibility and behavioral control were independently and positively associated with the intention to use condom. Those male students who perceive they are more at risk for HIV infection were nearly three times (OR=2.73, 95%CI=1.33,5.63) more likely to intend condom use for their next sexual intercourse compared to those not feeling the risk. Male respondents who perceive that they are able to control condom use were nearly five times (OR=4.76, 95%CI=2.31,9.79) more likely to intend its use at their next sexual intercourse than those with low level of perceived behavioral control. And this difference can range from 2.13 times to 9.79 times at 95% confidence level (Table 9).

Table 6: Relationship of socio-demographic, knowledge and theoretical constructs of female high school students of Jimma town to their intention to limit their sexual partners to one/remaining monogamous. March 2000.

Variables	n(%)	% Intend	Age adjusted OR (95% CI) Bivariate	Age adjusted OR (95%CI)Multivariate
Age: ≤ 16	118(46.8)	80.5	1.00	
> 16	134(53.2)	84.3	1.30(0.68,2.50)	
Education: Grade 9 - 10	177(61.7)	82.5	1.00	
Grade 11 - 12	110(38.3)	82.7	1.17(0.50,2.27)	
Religion: Muslim	86(30.1)	76.7	1.00	1.00
Christian	200(69.9)	85.5	2.14(1.09,4.22)*	1.99(0.89,4.45)
Ethnicity: Oromo	107(37.4)	84.1	1.00	
Amhara	77(26.9)	85.7	1.43(0.59,3.46)	
Other	102(35.7)	78.4	0.80(0.38,1.68)	
Know HIV/AIDS patient: Yes	186(70.5)	83.9	1.00	1.00
No	78(29.5)	79.5	0.61(0.30,1.23)	0.76(0.34,1.72)
Had Multiple sexual partners: No	40(75.5)	90.0	1.00	
Yes	13(24.5)	84.6	0.63(0.10,4.04)	
History of STI: No	50(89.3)	86.0	1.00	
Yes	6(10.7)	83.3	0.87(0.08,8.94)	
Contact with high risk partner: No	31(60.8)	87.1	1.00	
Yes	20(39.2)	90.0	0.88(0.13,6.13)	
Good HIV/AIDS Knowledge: No	73(26.1)	72.6	1.00	1.00
Yes	207(73.9)	86.5	2.61(1.30,5.24)**	1.84(0.79,4.28)
Perceived Susceptibility: No	122(42.1)	8.1	1.00	
Yes	168(57.9)	183.9	1.14(0.59,2.19)	
Perceived Severity: No	59(19.7)	78.9	1.00	
Yes	233(80.3)	83.7	1.41(0.65,3.04)	
Motivation to comply: No	125(43.7)	76.8	1.00	1.00
Yes	161(56.3)	87.0	1.74(0.90,3.36)	1.22(0.53,2.77)
Perceived Benefits: No	54(19.0)	57.4	1.00	1.00
Yes	230(81.0)	88.3	5.06(2.44,10.49)***	2.20(0.84,5.79)
Perceived Barriers: Yes	113(39.8)	71.7	1.00	1.00
No	171(60.2)	89.5	3.39(1.70,6.73)***	3.01(1.36,6.68)**
Normative belief: No	64(22.1)	64.1	1.00	1.00
Yes	226(77.9)	82.9	4.61(2.29,9.28)***	2.86(1.18,6.91)*
Outcome Evaluation: No	53(18.2)	71.7	1.00	1.00
Yes	238(81.8)	85.5	2.76(1.29,5.94)**	1.19(0.44,3.20)
Self-efficacy: No	159(56.0)	81.8	1.00	
Yes	125(44.0)	84.8	1.21(0.61,2.37)	
Perceived Behavioral Control: No	119(42.2)	73.1	1.00	1.00
Yes	163(57.8)	89.0	3.12(1.58,6.15)**	1.58(0.69,3.64)

* $p < 0.05$, ** $p < 0.01$, and *** $p < 0.001$

Table 7: Relationship of socio-demographic, knowledge and theoretical constructs of male high school students of Jimma town to their intention to limit their sexual partners to one/remaining monogamous. March 2000.

Variables	n(%)	% Intend	Age adjusted OR (95% CI) Bivariate	Age adjusted OR (95%CI)Multivariate
Age: ≤ 16	93(38.8)	81.7	1.00	1.00
> 16	147(61.4)	87.1	1.51(0.74,3.08)	1.28(0.57,2.90)
Education: Grade 9 - 10	164(59.6)	82.3	1.00	
Grade 11 - 12	111(40.4)	86.5	0.98(0.42,2.28)	
Religion: Muslim	83(30.1)	79.5	1.00	
Christian	193(69.9)	86.0	1.22(0.56,2.66)	
Ethnicity: Oromo	114(41.5)	82.5	1.00	
Amhara	63(22.9)	90.5	1.48(0.53,4.12)	
Other	98(35.6)	81.6	0.85(0.38,1.88)	
Know HIV/AIDS patient: Yes	165(61.1)	83.0	1.00	1.00
No	105(38.9)	85.7	2.03(0.90,4.60)	1.89(0.78,4.56)
Had Multiple sexual partners: No	59(62.1)	81.4	1.00	
Yes	36(37.9)	91.7	3.37(0.65,16.46)	
History of STI: No	90(90.0)	84.4	1.00	
Yes	10(10.0)	100.0	2.64(0.33,21.10)	
Contact with high risk partner: No	57(60.6)	84.2	1.00	
Yes	37(39.4)	86.5	0.83(0.23,3.05)	
Good HIV/AIDS Knowledge: No	22(8.0)	81.8	1.00	
Yes	254(92.0)	84.3	0.32(0.04,2.51)	
Perceived Susceptibility: No	77(27.9)	75.3	1.00	1.00
Yes	199(72.1)	87.4	2.61(1.26,5.42)*	1.80(0.79,4.12)
Perceived Severity: No	51(18.5)	78.4	1.00	
Yes	225(81.5)	85.3	1.14(0.46,2.83)	
Motivation to comply: No	88(32.6)	73.9	1.00	1.00
Yes	182(67.4)	89.0	2.92(1.40,6.09)**	1.63(0.71,3.71)
Perceived Benefits: No	38(13.9)	79.9	1.00	
Yes	236(86.1)	85.2	1.58(0.63,3.99)	
Perceived Barriers: Yes	132(47.8)	82.6	1.00	
No	144(52.2)	85.4	1.07(0.52,2.17)	
Normative belief: No	58(21.1)	58.6	1.00	1.00
Yes	217(78.9)	90.8	5.26(2.45,11.31)***	3.34(1.39,8.01)**
Outcome Evaluation: No	44(15.9)	88.6	1.00	
Yes	232(84.1)	83.2	0.56(0.16,1.95)	
Self-efficacy: No	182(66.7)	84.1	1.00	
Yes	91(33.3)	84.6	1.21(0.55,2.67)	
Perceived Behavioral Control: No	76(28.3)	71.1	1.00	1.00
Yes	193(71.7)	90.2	3.61(1.70,7.64)***	2.54(1.13,5.72)*

* $p < 0.05$, ** $p < 0.01$, and *** $p < 0.001$

Table 8: Relationship of socio-demographic, knowledge and theoretical constructs of female high school students of Jimma town to their intention of using condom at the next sexual intercourse. March 2000.

Variables	n(%)	% Intend	Age adjusted OR (95% CI) Bivariate	Age adjusted OR (95% CI) Multivariate
Age: ≤ 16	109(48.4)	45.0	1.00	1.00
> 16	116(51.6)	44.0	0.96(0.57,1.63)	0.57(0.27,1.20)
Education: Grade 9 - 10	156(62.2)	47.4	1.00	
Grade 11 - 12	95(37.8)	44.2	0.80(0.40,1.16)	
Religion: Muslim	78(31.2)	50.0	1.00	
Christian	172(68.8)	44.8	0.88(0.49,1.56)	
Ethnicity: Oromo	95(37.8)	52.6	1.00	
Amhara	69(27.5)	40.6	0.73(0.38,1.41)	
Other	87(34.7)	44.8	0.69(0.37,1.29)	
Had Multiple sexual partners: No	30(78.9)	63.3	1.00	
Yes	8(21.1)	50.0	0.52(0.10,2.79)	
Ever use condom: No	35(92.1)	60.0	1.00	
Yes	3(7.9)	66.7	1.69(0.13,21.27)	
History of STI: No	36(90.0)	55.6	1.00	
Yes	4(10.0)	75.0	3.00(0.27,33.08)	
Contact with high risk partner: No	21(56.8)	57.1	1.00	
Yes	16(43.2)	62.5	1.08(0.26,4.48)	
Ever discussed sexual history: No	6(15.0)	66.7	1.00	
Yes	34(85.0)	58.8	0.41(0.04,4.37)	
Know HIV/AIDS patient: Yes	163(71.2)	55.8	1.00	1.00
No	66(28.8)	30.3	0.32(0.16,0.61)***	0.31(0.13,0.75)**
Good HIV/AIDS Knowledge: No	64(26.2)	40.6	1.00	1.00
Yes	180(73.8)	48.3	1.68(0.89,3.17)	2.00(0.82,4.90)
Perceived Susceptibility: No	106(41.9)	35.8	1.00	1.00
Yes	147(58.1)	53.1	2.20(1.27,3.80)**	1.21(0.55,2.69)
Perceived Severity: No	48(19.0)	43.8	1.00	
Yes	205(81.0)	46.3	1.27(0.65,2.51)	
Motivation to comply: No	110(43.8)	40.9	1.00	1.00
Yes	141(56.2)	49.6	1.86(1.08,3.19)*	2.31(1.06,5.01)*
Perceived Benefits: No	58(23.3)	20.7	1.00	1.00
Yes	191(76.7)	53.9	5.20(2.38,11.35)***	2.01(0.72,5.61)
Perceived Barriers: Yes	153(60.7)	38.6	1.00	1.00
No	99(39.3)	57.6	2.41(1.39,4.19)**	1.40(0.63,3.12)
Normative belief: No	173(70.3)	34.7	1.00	1.00
Yes	73(29.7)	69.9	3.90(2.11,7.19)***	3.13(1.30,3.54)*
Outcome Evaluation: No	66(26.0)	53.0	1.00	1.00
Yes	188(74.0)	43.6	0.69(0.38,1.28)	0.37(0.14,1.04)
Self-efficacy: No	135(54.0)	33.3	1.00	1.00
Yes	115(46.0)	61.7	3.21(1.84,5.58)***	1.41(0.65,3.05)
Perceived Behavioral Control: No	129(52.0)	23.3	1.00	1.00
Yes	119(48.0)	70.6	10.4(5.56,19.48)***	5.76(2.57,12.93)***

* $p < 0.05$, ** $p < 0.01$, and *** $p < 0.001$

Table 9: Relationship of socio-demographic, knowledge and theoretical constructs of male high school students of Jimma town to their intention of using condom at the next sexual intercourse. March 2000.

Variables	N (%)	% Intend	Age adjusted OR (95% CI) Bivariate	Age adjusted OR (95% CI) Multivariate
Age: ≤ 16	93(39.6)	67.7	1.00	1.00
> 16	142(60.4)	70.4	1.13(0.64,1.99)	1.06(0.54,2.09)
Education: Grade 9 - 10	160(60.5)	67.5	1.00	
Grade 11 - 12	105(39.6)	69.5	0.74(0.38,1.43)	
Religion: Muslim	78(29.3)	62.8	1.00	
Christian	188(70.7)	70.7	1.36(0.74,2.50)	
Ethnicity: Oromo	107(40.4)	68.2	1.00	
Amhara	62(23.4)	64.5	0.93(0.45,1.90)	
Other	96(36.2)	71.9	1.25(0.65,2.40)	
Had Multiple sexual partners: No	57(63.3)	80.7	1.00	
Yes	33(36.7)	72.7	0.73(0.25,2.13)	
Ever use condom: No	73(79.3)	75.3	1.00	
Yes	19(30.7)	84.2	2.20(0.44,11.10)	
History of STI: No	86(90.5)	76.7	1.00	
Yes	9(9.5)	88.9	2.47(0.29,21.10)	
Contact with high risk partner: No	53(59.6)	77.4	1.00	
Yes	36(40.4)	75.0	0.77(0.27,2.20)	
Ever discussed sexual history: No	14(14.7)	71.4	1.00	
Yes	81(85.3)	79.0	1.66(0.33,8.37)	
Know HIV/AIDS patient: Yes	160(61.3)	69.4	1.00	
No	101(38.7)	67.3	0.99(0.55,1.76)	
Good HIV/AIDS Knowledge: No	23(8.6)	65.2	1.00	
Yes	243(91.4)	68.7	0.85(0.29,2.48)	
Perceived Susceptibility: No	73(27.5)	54.8	1.00	1.00
Yes	191(72.5)	73.4	2.26(1.24,4.12)**	2.73(1.33,5.63)**
Perceived Severity: No	49(18.5)	53.1	1.00	1.00
Yes	216(81.5)	71.8	1.86(0.92,3.75)	1.87(0.80,4.37)
Motivation to comply: No	86(33.2)	57.0	1.00	1.00
Yes	173(66.8)	74.0	2.20(1.22,3.95)**	1.57(0.79,3.14)
Perceived Benefits: No	28(10.6)	32.1	1.00	1.00
Yes	236(89.4)	73.3	5.56(2.13,14.18)***	1.26(0.38,4.14)
Perceived Barriers: Yes	137(51.9)	56.9	1.00	1.00
No	127(48.1)	81.9	2.88(1.59,5.22)***	1.79(0.89,3.62)
Normative belief: No	120(46.2)	59.2	1.00	1.00
Yes	140(53.8)	76.4	2.23(1.26,3.96)**	1.50(0.74,3.01)
Outcome Evaluation: No	73(27.4)	71.2	1.00	
Yes	193(72.6)	67.4	0.73(0.38,1.40)	
Self-efficacy: No	100(37.9)	55.0	1.00	1.00
Yes	164(63.1)	77.4	2.46(1.38,4.37)**	1.66(0.82,3.38)
Perceived Behavioral Control: No	84(32.1)	44.0	1.00	1.00
Yes	178(67.9)	80.9	5.95(3.21,11.02)***	4.76(2.31,9.79)***

* $p < 0.05$, ** $p < 0.01$, and *** $p < 0.001$

DISCUSSION

The most critical difference between HIV and most other life-threatening diseases is that HIV infection is communicable and can, in some cases, be contracted through relatively low rates of risk-taking behaviour. Moreover, sexual behaviour is complex and poses continuous challenge to the design of behavioural intervention. The challenges and unique urgency of the expanding HIV epidemic also require re-conceptualisation of paradigms used in behavioural research.

In sub-Saharan Africa, as in many countries in the industrialized world and elsewhere, people embark on sexual activity when they are in their teens—often around mid teens. In our study, students commence their sexual experience at early age. The reported mean and median age for the study subjects were 15 and 16 years. Male students are more likely to start their sexual activity at early age than female students. A number of recent studies conducted among varied adolescent population in different parts of Ethiopia also documented similar finding (first sexual experience at early age). In Addis Ababa, high school students had first sex between the ages of 14 - 16 years. In Gondar, college students 40.2% had previous sexual experience at the mean age of 17 years and other studies among high school students from the different parts of the country indicated mean age at first sexual intercourse to range from 15.3 to 16.5 years (4,37,50-52). Surveys from a number of African countries also documented that there is early sexual initiation (53,54).

AIDS-risk behaviors remain common. Some studies on HIV risk behaviors showed that, despite adequate knowledge about HIV/AIDS, higher proportion of people especially youth continue to experiment with high-risk behaviors (55). Of the behaviors known to place individuals at risk of

HIV infection, having multiple sexual partners is probably the key concern in much of the sub-Saharan Africa. The number of sexual partners may be considered part of a larger pattern of adolescent health-risk behavior. History of multiple sexual partners was the main risk factor for HIV infection among AIDS patients in Ethiopia. According to the reports of AIDS cases submitted to Ministry of Health, 87% of the cases had history of contact with multiple sexual partners (2).

Results from this study also indicated this fact. One third of the sexually active high school students had multiple sexual partners (lifetime) and one fourth of those who had sex in the past year also reported engaging in sexual act with more than one sexual partner. Generally, male students were more likely to have multiple sexual partners than female students. Similar findings were also documented by other studies in Ethiopia. Among out-of-school youth in Bahir Dar (1994) the average number of sexual partner for those who had practised sex was 3.9 ± 2.8 and in a similar study in Awassa (1995), the mean number of sexual partners was 2.9 ± 2.0 (6,7). Lemma and Hass (1994) reported that a good number of the adolescents were involved with more than one sexual partner. 63.2% of males and 30.0% of the females had had two or more sexual partners over the preceding twelve months. The mean number of partners for the females was 1.5 while that for the males was 2.2 (56). Gabie (1990), reported that among those sexually active high school students in Addis Ababa, 60.2% claimed to have had sexual relations with 2-5 persons, and the majority of respondents used no protective methods at all (50). Among high school students in a rural town, Northwest Ethiopia, the mean number of sexual partner for males was 2.2 while for the females was 1.1 (4).

Results from the current study both support and contradict findings from other researchers on adolescent condom use. In the current study, the rate of ever use of condom is low. Though there is indication in that the rate of condom consumption is increasing from year to year, the rate of condom use by individuals is still low.

Studies have found that younger subjects were significantly more likely to report higher frequency of condom use during sexual intercourse (57). Others found the reverse (58). The current study indicates that though there is a relatively higher condom use rate among the older students than younger ones, this difference was not significant. The possible logical explanation for this would be as age increase the frequency of exposure to sexual act would increase. With this also the likelihood of using condom will increase. Furthermore, as reported, young adolescent may find it difficult to obtain condoms, they may not have the money and feel embarrassed to go to and buy them from stores. Though not statistically significant, consistent with other studies, there is a relatively higher condom use rate among males compared to female students (6).

It was striking from the beginning of the AIDS epidemic that there was a high rate of concurrent infection, HIV and classic STIs, in the same patients. Currently, rate as high as 70% of HIV infection are found in African patients with STIs (1,55). Beside the biological co-factor evidence, the association between STIs and HIV can be explained by the behavior of the patient. Previous studies had already established that HIV transmission is enhanced in the presence of other STI, particularly STIs causing genital ulcer (55).

In 1993, survey of HIV and syphilis seroprevalence among antenatal care attendees aged 15-24 years in Addis Ababa indicated that syphilis seroprevalence was 8.8% reaching peak among 16-

17 year olds. The overall HIV prevalence rate among the study population was 13.6%. It was low among 16-17 year olds. These groups should be considered as highly vulnerable group exhibiting a combination of unwanted pregnancies, STI and HIV infection (59). Among out-of-school youth in Awassa 15/375 (4.0%) of the respondents reported history of pussy urethra discharge and/or genital lesion following sexual intercourse (6). The current study also found out a considerable number of students admitted that they had past history of genital symptoms of STIs.

The result of the current study indicated that nearly 40% of high school students had sexual intercourse with partner(s) who had one or more of the high risk factors. This finding also goes with other studies. A study conducted in four major cities of Ethiopia (1996), among those who had been sexually active, indicated the overall prevalence of non-regular sexual relationship to be 10.5% (18.2% among men and 5.2% among women). And on the same study the proportion that reported sexual intercourse with non-regular partner peaked at 20-24 years for both sexes (59). Fisseha et al (1997) reported that 10% among ten high school students in Addis Ababa had coital contact with CSWs. Only 42.2% of sexual encounter and only 27.7% used condoms consistently on their subsequent sexual encounter (55).

The most common behavioral profile among sexually active adolescents in this study was a teenager who had unprotected sexual intercourse (which commence at early age) with partner(s) believed (not proved) to be at low risk for carrying HIV (AIDS risk behavior index category 3 and 4). Because in the absence of HIV-antibody testing, one can not be certain that one's partner indeed is uninfected. Of particular concern because of their greatly increased risk of HIV infection are the 8.9% students who had unprotected sex with high-risk partner(s) or with history

of STIs (AIDS risk behavior index category 6). These students are potentially at risk for HIV infection, particularly because of a rather high number of sexual partners, an irregular use of condoms in the past, involvement in sexual act with high-risk partners and past history of STIs.

On summary, the above findings do tell us two things: young people are sexually active at younger age, and few of them use condoms. If young people are having unprotected sex with several partners, or if their single partner has ever had other partners, they are exposed not just to pregnancy but also to infection with sexually transmitted diseases including HIV (54).

Although a number of studies have documented the prevalence of AIDS risk and preventive behaviors among adolescents fewer have investigated theoretically or empirically suggested determinants of these behaviors, To this regard, this study tried to demonstrate predictors of preventive behavioral intentions. The findings from this study demonstrate that although beliefs derived from the behavioral models and AIDS preventive behavioral intentions were associated in the bivariate analysis, most of these associations were not significant in the multivariate model.

Among female as well as male students, when controlled for the influence of other constructs normative belief was independently related to intention to limit number of sexual partner. Other researchers (8,17,23,40,60) also supported the importance of normative belief (subjective norm). The fact that the perception that most others in the referent group would accept one being faithful to one's partner was such an important predictor in both sexes, underlines the role of social environment with respect to AIDS prevention behavior. This was also has been emphasised by Fisher et al (1995) (23).

The potential negative aspect of limiting the number of sexual partners in female students seems to act as an impediment to having the initiation to the recommended behavior. Perceived barrier is another independent predictor to the intention in this group of the study sample. A kind of cost-benefit analysis is thought to occur wherein the individual weighs the action's effectiveness against perception that may be expensive, unpleasant, inconvenient, time-consuming, sometimes dangerous, and so forth. Among female students the perception of less barriers was an independent and significant factor, which provide a preferred path of action (intended behavior). Apart from these constructs from the health behavior models the other constructs failed to predict intention to limit number of sexual partner independently and significantly. Such observation is not unique to this study (8,61).

The present research also examined predictors of intention to use condoms at the next sexual intercourse among high school students of Jimma town. The results showed that, consistent with the theory of planned behavior and in both sexes, perceived behavioral control has the major predictive power than the other predictors in predicting intention to use condom at the next sexual intercourse. This result parallels those of number of studies across a wide range of health behaviors (13,24). Similar finding on intention to use condom, but from a different analysis approach has also been documented among Tanzanian adolescents (22).

Concerning the relative importance of theoretical components, the strong effect was observed from perceived behavioral control in predicting the intention to use condom at the next sexual intercourse. Among female students the importance of the social environment is documented. Both components of the subjective norm (construct from TRA), motivation to comply and

normative belief, predict condom use at the next sexual intercourse independently and significantly. Similar findings were also reported from the Tanzanian and Dutch studies (22,40).

One of the major findings of this study was that the HBM did not significantly predict the intention to use condom at the next sexual intercourse. The exception to this would be perceived susceptibility among male students and cues to action among female students.

There were a number of gender differences that indicate male students were involved more in AIDS-related riskier sexual behaviors compared to female students. Compared to females, male students reported higher knowledge regarding HIV/AIDS, felt more susceptible, perceive more social support for safe sex practice, and perceive more efficacious in using condom in different situations. On the other hand, compared to males, female students perceive more the barriers towards limiting the number of sexual partner to one but appraise that they are able to do it more than male students. These findings of gender differences were also well documented by other similar studies on condom usage among adolescents (40,58).

Finally, the implication of the study findings is clear that the significant associations, which emerged from this research, should be incorporated into AIDS risk reduction programs. For example, individuals should be made aware of the dangers associated with being less concerned about multiple partnership and condom use. Students must be equipped with the skills of avoiding multiple partnership and use condom in different situations. Programs must be designed in such a way that relevant others would also practice safe sex. Using relevant others for passing messages and skills is required. The results also talk that strengthening and using voluntary

people living with HIV/AIDS for awareness creation would be plausible.

A key issue with respect to HIV primary prevention among the study population (both male and female) is how to make risk reduction socially normative within the vulnerable populations and how to produce these norm changes to curb the progress of the epidemic. Students will change their behavior in response to the true expectations of others more than through changes in individual beliefs or attitudes. This suggests that short of shift in social norms, individuals won't change. Therefore, the intervention plan must ensure that all channels reaching the network contain the same message to increase the perception that the new practice has wide support. In addition, intervention, which encourages community discussion on the issue, can be included with the assumption that such discussion will accelerate the process of social norm diffusion.

STRENGTHS AND LIMITATIONS OF THE STUDY

The study employed a random sample of high school students, which can represent the high school students of Jimma town. In order to answer the objectives of the study, a survey instrument was developed and tested to meet the need of the local context. The use of preliminary qualitative approach was instrumental in this regard. The study outcomes are indicative of considerations for program design and presented variables, which are amenable for change. The use of health behavior models by this study also initiated the application of these theoretical concepts in to research practice in Ethiopia.

The study did not intend to compare different theoretical models, but predictors were selectively derived from the health behavior models. Though the study has tried to improve the validity and the reliability of the information generated we perceive it has the following limitations. The participation of only high school adolescents will make the study to be unrepresentative of the entire adolescent population.

✓ Measuring sexual behavior is still complex and determining the accuracy of the reported sexual practice is impossible. In addition, the accuracy of the presumed risk status of partners is still questionable. Furthermore, using reported intentions as the criteria is a potential limitation because intention is not stable and can change over time. However, a recent meta-analysis concerning the intention-behavior consistency of condom use showed a fairly strong sample-weighted average correlation of $r=0.44$ (62).

To ensure the validity and reliability of the information generated by this study reliability was checked during pre-testing, data was compared with findings of other similar studies and some variables were counter checked with each other. Indirect methods were also used to validate the results of this study. These includes comparing results with finding from similar surveys in Ethiopia and other African countries as a means of establishing content validity, female data collectors were used for female respondents and males for male groups to avoid possible biases.

Because of the cross-sectional nature of the study, some caution should be exercised when interpreting the present findings, and replication of the results in longitudinal studies is desirable.

The small sample size of subjects who had sexual activity in the past one year may not be adequate and may account for the lack of significant difference in past year's sexual behavior variables between the two gender groups. The lack of literatures in the country for comparing the predictor constructs of these behavior intentions must be considered. And the current study outcome is believed to be an input to this regard.

CONCLUSION AND RECOMMENDATIONS

Based on the results and considering limitations of the study it is possible to conclude the followings. The majority of sexually active students are at higher risk of acquiring HIV infection. The risk is related to the sexual behavior they exhibit. The risk behaviors include commencement of sexual activity at early age that would latter result in the increased number of lifetime sexual partners. In addition, a considerable number of students had sexual intercourse with high-risk partners and not using condom. For this reason a number of students had sexual behaviour with high score on the AIDS risk behavior index. Behavioral change is especially important within this group.

Findings from this study suggest that there are a number of specific risk and preventive behaviors and predictors that need to be targeted for intervention among high-risk adolescent populations, some of which are gender specific. Therefore the following are the recommendations in line with what has been found from this study:

- AIDS prevention programs for youth should emphasise personal susceptibility to AIDS, instil in youth the self-belief and skill that they can avoid sex with another partner and use condom in different situations and address how to overcome barriers to safe sex.
- People living with HIV/AIDS who are willing to be publicly visible must be involved in sensitising youth to the potential threats of AIDS.
- Relevant people in the adolescents' environment must deliver health education messages addressing these constructs (i.e. persuasive messages presented by opinion leaders, religious leaders, peers).

- Community-level interventions should aim at strengthening the perception that others also accept and practice safe sex.
- Rearranging access to condoms, and educating adolescents about the absence of cure for AIDS, and addressing broad social norms about condom use is important.
- School based interventions must make sure that adolescents are confident that they can negotiate condom use with new partners through skill training, and reward newly practised behaviors.

Finally, the goal must not be to select one strategy in isolation but to select a set of strategies that together promise to achieve the desired goals. Given the impracticality and cost of face-to-face intervention for curbing an epidemic that requires quickly reaching large number of people, research evaluating mass interventions is critical. There is a pressing need to accelerate the pace, scale, and scope of HIV prevention research. This will ask for behavioral research interventions which can be conducted on a scale large enough to carry direct public health benefits by curbing new HIV infections, merging research and public health application interests, and focussing attention on populations most imminently vulnerable to new infections like adolescents.

Models are needed that begin brief but with carefully evaluated efficacy pilot studies. This will help to determine the feasibility and the behavior change potentials of positive results. Useful prevention approaches, quickly developed with this approach, can rapidly be integrated in to the social structures and service delivery channels needed to effectively reach large number of people.

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APPENDIX 1

Interview Format: *To be filled during interview with key informant (high school Adolescents) of Jimma town regarding their Belief-Behavior in relation to HIV/AIDS.*

I. Introduction and Purpose

1. Thanks for being willing.
2. Tell that his/her information is important
3. We will be discussing your feeling regarding HIV/AIDS.
5. I'm interested in all your ideas, comments and suggestions

II. General Knowledge of HIV/AIDS.

1. How do you learn about the existence of HIV/AIDS?
2. What are the sources of infection?
3. What behaviors of young people do you think put them at risk of getting infection?
4. What do you think a person should do to prevent himself/herself from getting the infection?
(Probing: *Tell me more about that? Can you explain that? Why do you think so? What else?*)

III. Benefits and Barriers of limiting sexual partner to one/consistent condom use. (Always probe: *What about that? Can you explain that? How do you feel about that? Tell me more about that?*)

1. What are the reasons for peoples to Limit sexual relation to one regular partner/use condom?
2. What are the benefits one will get by limiting sexual partner to one/consistent condom use?
3. What are the losses one will face by involving in limiting sexual partner to one/consistent condom use?

IV. Self-Efficacy situation: What are situations which pose difficulty for individual not to practice limiting sexual partner to one/consistent condom use even if he/she wants to? (Probe: *What about that? Can you explain that? Tell me more about that?*)

V. Normative Belief: What peoples are important in an individual life of your age? (Probe: *Why do you select that? Can you explain that? Tell me more about that?*)

VI. Closing: Before we end, is there's anything else you'd like to say about anything else we haven't mention that would be important?

Thank you so much for giving me the time to discuss with you today. Your time is very much appreciated and your insights have been very helpful.

APPENDIX 2

Response to the eight-pretest questions, concerning the instrument and methodology, by high school students of Agaro town, February 2000.

VARIABLE	RESPONSE RATE %	RESPONSES		
		No	Yes	Refuse to answer
It is clear	80	4	74	2
It is easy to understand	84	9	71	4
It is embarrassing	84	55	19	10
Difficult to remember some answers	85	44	34	7
So many questions	86	20	60	6
Need too much time	85	22	56	7
Repetition of questions	85	21	57	7
The flow of questioning is good	83	12	66	5

APPENDIX 3

STUDENT SELF REPORTING QUESTIONNAIRE TO BE FILLED BY HIGH SCHOOL ADOLESCENTS OF JIMMA TOWN

SEX OF PARTICIPANT (MALE / FEMALE)

March 2000

Dear student,

In ensuring the health of adolescents the understanding of existing problems and related behaviors of this group of the population is important. In line with this a study was proposed to assess the health behaviors of high school adolescents and you are chosen to participate in this study. The choice was done randomly using a lottery type of approach.

The purpose of this study is to generate information on behavior of high school adolescents that can be used to design health education. The study will involve various intimate and private life questions. In order to effectively attain the goal we are asking you for your help. Here is a survey for you to complete. There is no need to put your name on the survey; no individual responses will be reported. It is your full right to refuse to answer any or all of the questions. If you don't want to participate you can leave the format on the table (*up side down*). But, you are requested to remain in your seat until others finish filling the format. Please take a few minutes to answer to the questions.

Do you wish to participate in the study?

YES, I want to participate in the study. (Please go to the next page)

NO, I don't want to participate in the study.

Thank you very much!

PART ONE: General Information

The following are general questions and statements for you. Please indicate your response by circling the number of your choice.

- 1.1 Name of the school 1. Jeren High School 2. Jimma High School
- 1.2 Your age in years _____
- 1.3 Your current school Grade 1. 9th 2. 10th 3. 11th 4. 12th
- 1.4 Are you currently married? 1. No 2. Yes
- 1.5 What is your religion? 1. Orthodox 2. Protestant 3. Muslim 4. Jehovah witness
5. Catholic 6. Other religion 7. Non-religious
- 1.6 What is your ethnic group? 1. Oromo 2. Amhara 3. Gurage 4. Keffa
5. Yem 6. Dawro 7. Other
- 1.7 Family size (the number of people living with you in your family) _____
- 1.8 Is your father currently alive? 1. No 2. Yes

If your answer to question number 1.8 is No, then SKIP TO question number 1.11. But, if your answer is Yes answer the following question.

- 1.9 What is your father's educational status in terms of grade completed?
1. Illiterate 2. Read and write only 3. Grade 1–4 4. Grade 5–8
5. Grade 9–12 6. Above grade 12
- 1.10 What is your father's employment status?
1. Unemployed 2. Government employed 3. Self employed 4. Other
- 1.11 Is your mother currently alive? 1. No 2. Yes

If your answer to question number 1.11 is No, then SKIP TO question number 2.1. But, if your answer is Yes answer the following question.

- 1.12 What is your mother's educational status in terms of grade completed?
1. Illiterate 2. Read and write only 3. Grade 1–4 4. Grade 5–8
5. Grade 9–12 6. Above grade 12
- 1.13 What is your mother's employment status?
1. Unemployed 2. Government employed 3. Self employed 4. Other

PART TWO:

As it is mentioned earlier all the information you are giving will not be reported as individual responses. For this reason please don't write your name or ID number on the questionnaire. Your honest responses are requested.

- 2.1 At what age (in years) was your first menses? _____ **{FOR FEMALE RESPONDENTS ONLY}**
- 2.2 Have you ever had sexual intercourse in the past? 1. No 2. Yes

If your answer to question number 2.2 is No, then SKIP TO question number 2.18. But, if your answer is Yes answer the following question.

- 2.3 At what age did you have your first sexual intercourse? _____
- 2.4 How many different sexual partners did you had in the past?
1. Only one partner 2. Two to Five partners 3. More than five partners
- 2.5 How frequently were you using condom during your sexual intercourse episodes?
1. Never used 2. Sometimes 3. Most of the times 4. Always
- 2.6 Have you ever had genital symptoms of STIs (ulceration around your genitalia and/or discharge) in the past?
1. No 2. Yes
- 2.7 Does it happen that you had sex with the following individuals? *(Mark your responses for all of the questions)*
- 2.7.1 Person(s) you have known for a period of less than three weeks (casual partner)? 1. No 2. Yes
- 2.7.2 Person(s) who had (presumed) multiple sexual partners? 1. No 2. Yes
- 2.7.3 Partner(s) who had (presumed) sexually transmitted infections (STIs)? 1. No 2. Yes
- 2.7.4 Commercial Sex Worker(s) or person(s) who did have (presumed) sexual intercourse with CSW(s).
1. No 2. Yes
- 2.8 Do you currently have a steady sexual partner/someone with whom you have been having sex with for at least three months? 1. No 2. Yes

- 2.9 Have you ever discussed your sexual history with any of the following individuals? (*Mark all applicable*)
 1. Never discussed 2. Friend(s) 3. Parent(s) 4. Sexual Partner(s)
 5. Teacher(s) 6. Other person(s)
- 2.10 Have you ever had sex after having alcohol? 1. No 2. Yes
- 2.11 If yes, was condom used? 1. No 2. Yes
- 2.12 For Female Students only:** Did you ever used any other contraceptive other than condom? 1. No 2. Yes
- Now the following questions will continue to ask you about your sexual experience in the past one year. Please try to remember all the sexual encounters you had in the past twelve months. Again, all this information will remain completely anonymous.**
- 2.13 Did you have sexual intercourse in the past one-year (12 months)? 1. No 2. Yes
- If your answer to question number 2.13 is No, then SKIP TO question number 2.18. Otherwise answer question 2.14.**
- 2.14 How many different sexual partners did you have in the past one-year (12 months)?
 1. Only one partner 2. Two to Five partners 3. More than five partners
- 2.15 How frequently were you using condom during your past year's (12 months) sexual intercourse episodes?
 1. Never used 2. Sometimes 3. Most of the times 4. Always
- 2.16 The reasons for you to use condom during sexual intercourse were, (*Mark all your reasons*)
 1. I never used condom 2. Want to prevent pregnancy 3. Didn't discuss about it with my partner
 4. Want to prevent HIV/AIDS 5. Don't trust my sexual partner 6. Don't know sexual partner well
 7. Other reason(s)
- 2.17 What were the reasons for you not to use condom during sexual intercourse? (*Mark all your reasons*)
 1. I used condoms always 2. Dislike condoms 3. Didn't discuss with my sexual partner
 4. Couldn't find condoms 5. I am in love with my partner 6. Condom is expensive
 7. I have trust on my partner 8. Didn't have reason to use 9. Sure that my partner is disease free
 10. Partner didn't like condom to be used 11. Other reason(s)
- 2.18 From where did you hear about HIV/AIDS in the past? (*Mark all applicable sources of information*)
 1. Family 2. Church/Mosque 3. Health Facility 4. Neighbors 5. Theater/Cinema
 6. School 7. Friends 8. Poster/pamphlets 9. Radio 10. Television
 11. Newspaper 12. Other 13. Never heard
- 2.19 Have you been thought about AIDS/HIV infection at school? 1. No 2. Yes
- 2.20 Did you know anyone who have/had HIV/AIDS? 1. No 2. Yes
- 2.21 Where do you think one can get condom if he/she wants to use? (*Mark all your possible sources*)
 1. School 2. Hotels/Bars 3. Health Facility 4. Theater/Cinema 5. Shops
 6. Pharmacy 7. Church/Mosque 8. Other place 9. I don't know
- 2.22 How much is the cost of three condoms?
 1. Less than 50 cents 2. 50 cents to 1 birr 3. More than one birr 4. Don't know

PART THREE: The following are statements regarding HIV/AIDS and Condoms. Mark (✓) in the boxes provided according to your degree of agreement to the statements. Example, for the statements you are sure of its truth mark Strongly agree and for that of false statement strongly disagree.

	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
3.1. Infected person who appears healthy can't transmit the disease.	☐	☐	☐	☐	☐
3.2. At present there is cure for AIDS.	☐	☐	☐	☐	☐
3.3. There is a vaccine available to the public that protects a person from getting AIDS.	☐	☐	☐	☐	☐
3.4. A person with multiple sexual partners has more risk of infection with HIV/AIDS.	☐	☐	☐	☐	☐
3.5. Another source of getting HIV/AIDS infection could be injection with unsterile needles.	☐	☐	☐	☐	☐

	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
3.6. We can get AIDS by attending school with a child who has the AIDS virus.	☐	☐	☐	☐	☐
3.7. A mosquito who feed on AIDS patient's blood can transmit the disease.	☐	☐	☐	☐	☐
3.8. A pregnant woman who has the AIDS virus can pass it to her baby.	☐	☐	☐	☐	☐
3.9. Egg of hen who licked on condom used by AIDS patient can have the virus.	☐	☐	☐	☐	☐
3.10. Having sex with only one faithful sexual partner reduce the risk of HIV infection.	☐	☐	☐	☐	☐
3.11. One can prevent HIV/AIDS by avoiding sex (that means no sex).	☐	☐	☐	☐	☐
3.12. By avoiding sex with multiple partners one can prevent HIV infection.	☐	☐	☐	☐	☐
3.13. Using condom during sexual intercourse can reduce the risk of HIV infection.	☐	☐	☐	☐	☐

The following statements are written to describe your behavior. Mark (✓) in the boxes provided according to your degree of agreement to these statements. As you can see there is no need to write name or ID in this study, all information will remain anonymous. Therefore, your honest answer is important to us.

	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
4.1 With my current sexual behavior my chance of getting HIV/AIDS infection in the next five years is high.	☐	☐	☐	☐	☐
4.2 I feel it is likely for me to get HIV/AIDS if I have sexual intercourse with different partners.	☐	☐	☐	☐	☐
4.3 I feel it is likely for me to get sexually transmitted infections if a condom is not used during sexual intercourse?	☐	☐	☐	☐	☐
4.4 If I get infected with AIDS virus I will definitely die consequently.	☐	☐	☐	☐	☐
4.5 I would rather have any other terminal illness than AIDS.	☐	☐	☐	☐	☐

Here are statements regarding abstaining from sex before marriage. How true are these statements compared to your actual behavior? Mark (✓) in the boxes provided according to your degree of agreement to these statements. If you are not sure of it mark in the box under "Neutral".

	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
4.6 'I am not sure that I would be able to say NO having sexual intercourse.....':					
4.6.1 with someone I have dated for a long time.	☐	☐	☐	☐	☐
4.6.2 with someone I want to fall in love with.	☐	☐	☐	☐	☐
4.6.3 with someone who is pushing me to have sexual intercourse.	☐	☐	☐	☐	☐
4.6.4 with someone after I have been drinking alcohol.	☐	☐	☐	☐	☐

	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
4.7 'For me avoiding sex before marriage will protect me and my partner':					
4.7.1 from having unwanted pregnancy.	☐	☐	☐	☐	☐
4.7.2 from getting sexually transmitted diseases.	☐	☐	☐	☐	☐
4.7.3 from getting HIV/AIDS.	☐	☐	☐	☐	☐

	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
4.8 Refusing sex with a casual partner will make it seem that I am sexually weak.	☐	☐	☐	☐	☐
4.9 I may lose my partner if I say no to have sex.	☐	☐	☐	☐	☐
4.10 To get a better partner I must try several partners even with sexual intercourse.	☐	☐	☐	☐	☐
4.11 Refusing sex with my steady partner will make it seem that he or she has AIDS.	☐	☐	☐	☐	☐

<i>'I very much want to':</i>	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
4.12 prevent myself/my lover from getting pregnant	☐	☐	☐	☐	☐
4.13 protect myself from getting sexually transmitted disease.	☐	☐	☐	☐	☐
4.14 protect myself from getting AIDS.	☐	☐	☐	☐	☐
4.15 show my lover that I care about his or her health.	☐	☐	☐	☐	☐

4.16 <i>'The following individuals would approve of my avoiding sex before marriage'.</i>	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
4.16.1 My lover	☐	☐	☐	☐	☐
4.16.2 My close friend(s)	☐	☐	☐	☐	☐
4.16.3 My Teacher(s)	☐	☐	☐	☐	☐
4.16.4 My parent(s)/ Relative(s)	☐	☐	☐	☐	☐
4.16.5 Religious Leaders	☐	☐	☐	☐	☐

4.17 <i>'I am certain that I would be able to avoid sex before marriage even if':</i>	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
4.17.1 I am drunk.	☐	☐	☐	☐	☐
4.17.2 I am forced by my friends.	☐	☐	☐	☐	☐
4.17.3 I am told that condom will be used.	☐	☐	☐	☐	☐
4.17.4 I know I may lose my partner.	☐	☐	☐	☐	☐
4.17.5 to a partner with whom I want to fall in love with.	☐	☐	☐	☐	☐

	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
4.18 'From now onwards, I intend to avoid any sex before marriage.'	☐	☐	☐	☐	☐

The following statements are concerning limiting the number of sexual partners to only one. How true are these statements compared to your actual behavior? Show your agreement or disagreement by marking (✓) in the boxes provided under your choice.

4.19 'Remaining with one steady sexual partner.....':	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
4.19.1 will protect me from getting sexually transmitted diseases.	☐	☐	☐	☐	☐
4.19.2 will protect me from getting AIDS.	☐	☐	☐	☐	☐
4.19.3 can show my sexual partner that I care about his/her health.	☐	☐	☐	☐	☐

	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
4.20 Limiting my sexual desire to only one partner will reduce my sexual pleasure.	☐	☐	☐	☐	☐
4.21 To avoid sex with partners other than my steady sexual partner will make me seem sexually weak.	☐	☐	☐	☐	☐
4.22 Refusing sex with a casual partner will make it seem that he/she has AIDS.	☐	☐	☐	☐	☐

'I very much fear.....':	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
4.23 suspecting my sexual partner of having AIDS.	☐	☐	☐	☐	☐
4.24 losing my boy/girlfriend.	☐	☐	☐	☐	☐
4.25 not finding appropriate sexual partner for me.	☐	☐	☐	☐	☐

	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
4.26 'My best friend would make a fool out of me if I limit myself to only one steady sexual partner'.	☐	☐	☐	☐	☐
4.27 'My teacher would approve of my limiting to only one steady sexual partner'.	☐	☐	☐	☐	☐
4.28 'If I limit myself to only one steady sexual partner, my parents would approve my action'.	☐	☐	☐	☐	☐
4.29 'My religious leaders would approve of my limiting my sexual activity to only one steady partner'	☐	☐	☐	☐	☐

4.30 'I would like to do what':	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
4.30.1 my sexual partner think(s) that I should do'.	☐	☐	☐	☐	☐
4.30.2 my close friend(s) think(s) that I should do'.	☐	☐	☐	☐	☐
4.30.3 my teacher(s) think(s) that I should do'.	☐	☐	☐	☐	☐
4.30.4 my parent(s) think(s) that I should do'.	☐	☐	☐	☐	☐
4.30.5 my religious leader(s) think(s) that I should do'.	☐	☐	☐	☐	☐

4.31 'I am certain that I would be able to limit myself to only one steady sexual partner even if':	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
4.31.1 I am told that that condom would be used.	☐	☐	☐	☐	☐
4.31.2 I am pushed by my friends to have sex with a new partner.	☐	☐	☐	☐	☐
4.31.3 I meet someone I have been very much thinking of.	☐	☐	☐	☐	☐
4.32 'From now onwards, I intend to limit my sexual contact to only one steady sexual partner.'	☐	☐	☐	☐	☐

The following statements are concerning condom use. How true are these statements compared to your actual behavior? Show your agreement or disagreement by marking (✓) in the boxes provided under your choice.

'I am sure that I would be able to':	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
4.33 insist on using a condom during sex even if my boyfriend or girlfriend refuses to use a condom.	☐	☐	☐	☐	☐
4.34 get the money to buy condom.	☐	☐	☐	☐	☐

4.35 'I think my using condom at the next sexual intercourse would':	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
4.35.1 prevent my sexual partner / me from becoming pregnant.	☐	☐	☐	☐	☐
4.35.2 protect me from getting a sexually transmitted disease.	☐	☐	☐	☐	☐
4.35.3 protect me from getting AIDS.	☐	☐	☐	☐	☐

	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
4.36 Condom is difficult for me to use.	☐	☐	☐	☐	☐
4.37 Condoms create doubts between sexual partners.	☐	☐	☐	☐	☐
4.38 Condoms are shameful for me to buy.	☐	☐	☐	☐	☐

'I very much fear':	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
4.39 not be able to use condom properly	☐	☐	☐	☐	☐
4.40 reduce my sexual desire.	☐	☐	☐	☐	☐
4.41 being uneasy.	☐	☐	☐	☐	☐
4.42 introducing feelings of distrust between my sexual partner and me.	☐	☐	☐	☐	☐
4.43 seeming sexually weak.	☐	☐	☐	☐	☐

4.44 'The following people would approve of my using condoms at the next sexual intercourse'.	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
4.44.1 My sexual partner(s)	☐	☐	☐	☐	☐
4.44.2 My best friend(s)	☐	☐	☐	☐	☐
4.44.3 My teacher(s)	☐	☐	☐	☐	☐
4.44.4 My parent(s)	☐	☐	☐	☐	☐

4.44 'The following people would approve of my using condoms at the next sexual intercourse'.	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
4.44.5 My religious leader(s)	☐	☐	☐	☐	☐

'I am certain that I would be able to use condom at the next sexual intercourse even if':	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
4.45.1 I am drunk	☐	☐	☐	☐	☐
4.45.2 I feel shy to discuss using condoms with my partner.	☐	☐	☐	☐	☐
4.45.3 I feel embarrassed to buy condoms.	☐	☐	☐	☐	☐
4.45.4 my sexual partner refuses to use condoms.	☐	☐	☐	☐	☐
4.45.5 I have sexual intercourse with someone I have been very much thinking of.	☐	☐	☐	☐	☐

	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
4.46 'I intend to use a condom at the next sexual intercourse'.	☐	☐	☐	☐	☐

PART FIVE: FUTURE PLAN

- 5.1 Which of the following behavioral changes do you plan to use in the future to prevent yourself from being infected with HIV/AIDS? (Mark all your choices in the spaces provided)
- | | |
|---|--|
| 1. Reduce number of sexual partners | 2. Select carefully sexual partners |
| 3. Abstain from sexual intercourse | 4. Have good food |
| 5. Avoid unsafe injections and/or sharp objects | 6. Look for symptoms of AIDS before any sexual intercourse |
| 7. Reduce frequency of sexual intercourse | 8. Avoid sex with casual partners |
| 9. Strictly remain with one regular partner | 10. Prayed to God |
| 11. Do regular exercise | 12. Always, using condom during sexual intercourse |
| 13. Other method | |
- 5.2 Assume the test for HIV/AIDS is available; will you be interested to be tested for HIV/AIDS?
1. No 2. Yes
- 5.3 Assume you are tested for HIV/AIDS; will you be willing to hear the result of your test? 1. No 2. Yes

This is the end of this questioning. As promised at the beginning, your individual responses will not be exposed and you are not requested to write your name or ID.

THANK YOU!

APPENDIX 4 AIDS RISK BEHAVIOR INDEX

Categories of AIDS risk behavior index

CATEGORY 0:

Sexual abstinence

CATEGORY 1:

Sexual intercourse consistently using condom with one low risk partner

CATEGORY 2:

Sexual intercourse consistently using condom with two or more low-risk partner

CATEGORY 3:

Sexual intercourse with one low risk partner with out or inconsistently using
condom

CATEGORY 4:

Sexual intercourse with two or more low risk partner with out or inconsistently
using condom

CATEGORY 5:

Sexual intercourse consistently using condom with one or more high risk partners

CATEGORY 6:

Sexual intercourse with one or more high-risk partners without or inconsistently
using condom or history of sexually transmitted disease.

APPENDIX 5

Reliability of Constructs derived from health behavior models for the different safe sex behaviors and intention responded by students of Jimma town. March 2000.

CONSTRUCT	# OF ITEM	MEAN	SD	$\alpha^{\dagger}$
HIV/AIDS INFECTION:				
Knowledge	13	-	-	0.60
Motivation to comply	5	17.22	5.92	0.86
Perceived Severity	2	8.27	1.95	0.46
Perceived Susceptibility	3	10.17	2.41	0.34
LIMITING TO ONLY ONE STEADY SEXUAL PARTNER:				
Perceived Barriers	3	10.10	3.19	0.57
Perceived Benefits	3	12.59	5.20	0.84
Perceived Behavioral Control	3	11.10	3.38	0.76
Normative belief	4	14.87	3.24	0.47
Outcome Evaluation	6	22.42	4.56	0.53
Self Efficacy	4	11.9	4.48	0.74
Intention	1	3.81	1.17	-
CONDOM USE:				
Perceived Barriers	3	9.45	3.06	0.58
Perceived Benefits	3	12.73	2.89	0.89
Perceived Behavioral Control	5	17.71	4.71	0.82
Normative belief	5	15.28	6.08	0.90
Outcome Evaluation	6	20.48	4.17	0.37
Self Efficacy	2	7.12	2.12	0.53
Intention	1	4.44	0.95	-

† Cronbach's α

APPENDIX 6 *DATA TRANSFORMATION SCHEDULE:*

The following constructs were formed from the row data

- The AIDS risk behavior index
- Variables: 2.2, 2.4, 2.5, 2.7.1 - 2.7.4 and 2.6 were re-coded in to a single variable INDEX (legal value ranging from 0 to 6)

The scoring for part three and four were transformed from 5 to 1 for positive statements and subsequently reversed for negative statement

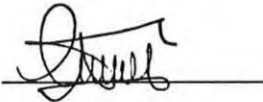
SCORING OF CONSTRUCTS

- General HIV/AIDS:
 - Knowledge = Σ (3.1:3.13)
 - Perceived Susceptibility = Σ (4.1:4.3)
 - Perceived Severity = Σ (4.4 and 4.5)
 - Motivation = Σ (4.30.1:4.30.5)
- Limiting sexual partner:
 - Self-Efficacy = Σ (4.6.1:4.6.4)
 - Perceived Benefit = Σ (4.19.1:4.19.3)
 - Perceived Barrier = Σ (4.20:4.22)
 - Outcome evaluation (Desirable and Undesirable) = Σ (4.13:4.15) and Σ (4.40, 4.43,4.23)
 - Normative Belief = Σ (4.26:4.29)
 - Perceived Behavioral Control = Σ (4.31.1:4.31.3)
 - Intention = 4.32
- Condom use at the next sexual intercourse:
 - Self-Efficacy = Σ (4.33 and 4.34)
 - Perceived Benefit = Σ (4.35.1:4.35.3)
 - Perceived Barrier = Σ (4.36:4.38)
 - Outcome evaluation (Desirable and Undesirable) = Σ (4.12:4.14) and Σ (4.39, 4.42,4.41)
 - Normative Belief = Σ (4.44.1:4.44.5)
 - Perceived Behavioral Control = Σ (4.45.1:4.45.6)
 - Intention = 4.46

DECLARATION

I, the undersigned, declared that this thesis is my original work, has not been presented for a degree in this or any other university, and that all sources of materials used for the thesis have been fully acknowledged.

Name: Eyob Lemma, MD

Signature: 

Place: Addis Ababa, Ethiopia

Date of submission: December, 2000

This thesis has been submitted for examination with my approval as University advisor

Name Shabbir Ismail Abbas

Signature 