

# Application of the Theory of Planned Behavior to Assess the Determinants of HIV/AIDS Risk among High School Students in Hawassa City, Ethiopia

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## Abstract

High school students are more likely to be at risk of HIV/AIDS. Knowledge gaps and misconceptions in areas of HIV transmission, unfavorable attitudes and risky sexual behavior are the major hindrances to prevent the spread of HIV. To assess the determinants of the risk behavior towards HIV/AIDS among high school students in Hawassa city, a cross sectional study was conducted. Percentage was used to determine the level of knowledge, attitude, perceived behavioral control and subjective norm of students. Logistic regression analysis; P-value, odds ratio and confidence interval was computed. Out of 367 study participants, 245 (66.8%) have good knowledge towards HIV/AIDS. Student's behavior is found significantly affected by their gender, a type of school, perceived behavioral control and attitude towards HIV at ( $p < 0.05$ ). Multivariable Logistic regression analysis revealed the student's behavior is significantly affected only by their attitude at ( $p < 0.001$ ). The study highlighted misconceptions about preventive methods of HIV transmission and risky sexual behaviour which need to be addressed. Specified, focused, continued and strengthened education on HIV/AIDS to bring change in behavior, through modifying their attitude is recommended.

**Keywords:** Attitude; HIV/AIDS; Perceived behavioral control; Subjective norm

## Introduction

Since the first HIV case was recognized in the United States in 1981, it spread rapidly throughout the world. Statistics from the Joint United Nations Programme on HIV/AIDS (UNAIDS) and the World Health Organization (WHO) in 2014 reported 35 million people were living with HIV in the world at the end of 2013. An estimated 2.1 million [1.9 million–2.4 million] people became newly infected with HIV and 1.5 million [1.4 million–1.7 million] people died from AIDS-related illnesses. The report also indicated that the highest number of people living with HIV was in sub-Saharan Africa 24.7 million people; three countries; Nigeria, South Africa and Uganda account for 48% of all new HIV infections in the mentioned year. Globally HIV adversely affects young people. It is estimated that about 40 percent of new infections among people over the age of 15 were in youth between the ages of 15 to 24 years. Currently, the sub-Saharan African population represents almost 71% of total HIV cases worldwide where the majority is young Africans aged 16-24 [1].

Demographic health's surveys of many countries have also prevailed that adolescent now are experiencing puberty at younger age than the previous generation. As result, they are involved in early initiation of sexual intercourse; most of it being unsafe, unplanned and exposing them to unwanted pregnancy, abortion and sexually transmitted disease [2]. Mostly adolescent age is a time to experiment with sex; in the course of experimentation, adolescents often encounter high risk situations, such as contracting STI /HIV/AIDS. According to a study from Ethiopia, for some portion, adolescent is characterized by recklessness and lower perception of vulnerability to adverse effect of above risk behaviors [3]. Unsafe sex is a major threat to the health and survival of millions of adolescents each year one in 20 adolescents contracts on STIs including HIV and every day over 700 young people aged 10-24 become infected with HIV/AIDS [4].

The median age of sexual debut in a global context is below the age of 20 for young women and men in numerous developing countries [5,6]. DHS data from 60 developing countries by UNESCO [7]; showed

that 25% of girls and boys had sexual intercourse before age fifteen. The influence of alcohol and experimentation with drug should not be overlooked since it increases the incidence of high-risk behaviors and also sexual offense such as rape; usually committed under the influence of alcohol or drug [8]. Globally, high school students are in the age range with the highest rates of new HIV infections. Adolescents are at high risk for HIV infection due to high frequency of sex and rate of partner change, short duration of sexual relationships, risk-taking behavior and low perceptions of HIV [9]. In Ethiopia it is estimated that most upper secondary school students lie within the age group of 15 to 24 years hence; they are likely to be a risk of HIV/AIDS [10]. In Ethiopia research findings have noted higher sexual activity among urban youths due to a higher level in multiple sexual partners and they are more vulnerable to HIV transmission due to increased sexual risk behaviors [11].

Gender is one major factor for HIV infection; it is for this reason that in a world wide scale, women account for 48% of adults who are infected with HIV/AIDS. In Sub-Saharan Africa, where HIV is spreading through heterosexual activities, women account for 55% of adults infected with HIV [12]. In many sub-Saharan African countries, young women ages 15-24 are two and six times more likely to be HIV-positive than men of a similar age [13]. This is often exacerbated by the fact that most young women are likely to be having sex with men even older than themselves due to economical reason like "Sugar

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daddy” relationship in many African cities. Another serious issue is that younger girls lack sexual negotiation because of fear of physical abuse, rejection and their partner objection [14].

A literature on health related behavior emphasizes the perception of being at risk of infection as one of the necessary conditions for behavioral change [15]. Moreover, the degree of the perceived risk seems to affect individual actual control in adopting preventive measures. Individual risk perception as well as individual knowledge, is likely to be subjected to socio-environmental influences, as long as social interaction allows information exchange, facilitates common evaluation and definition of the meaning and of its validity [12]. The correlation between high-risk behavior and HIV/AIDS knowledge are strongly related in the literature [16]. Knowledge on HIV/AIDS is affected by a variety of factors; study finding in Ethiopia revealed high level of misconception about HIV/AIDS among the target groups selected in the study [17].

Studies conducted on high school students in northern Ethiopia, shows that knowledge of HIV on the mode of transmission were high but on methods of prevention of HIV were low [18]. Another study conducted on university students in china and Lao reported despite adequate knowledge about HIV/AIDS among high school students, misconceptions about routes of transmission were found and negative attitudes to HIV/AIDS and risky practices were also present [19-20]. In somewhat a similar vein, a study from South Africa showed that high school learners had high levels of HIV-related knowledge, however, it revealed knowledge gaps and misconceptions in areas of HIV transmission, prevention, and control and this resulted in negative attitudes towards HIV [21].

Good knowledge of HIV/AIDS but poor prevention practice that may expose them for infection is reported by a study done in south west Ethiopia [22]. To the contrary, other studies conducted among students showed poor knowledge, favorable attitude and poor practices towards HIV/AIDS and the study highlighted misconceptions about preventive methods of HIV transmission and risky sexual practices which need to be addressed [23,24].

Literature and empirical experience tells us that knowledge and attitude of an individual towards a given object determine whether the person takes action or not to overcome that certain object or problem although, socio-economic status and gender characteristics have the role of changing the level of knowledge and attitude of an individual or a given community [25]. Adequate knowledge is not a sufficient condition to influence behavioral change but there is a consensus that having correct information is fundamental to behavior change [12,16]. In these regard, HIV/AIDS knowledge and attitude of our target group of high school students, has a great contribution on the drastic spread of this killer disease in our country. In Ethiopia, a large number of adolescents are enrolled in high schools but it is reported that the level of comprehensive HIV/AIDS knowledge and access to HIV/AIDS information and services has been a matter of great concern [11].

Ethiopian young adults from the ages of 15-24 account for more than half of all new HIV infections [27]. Recent literature has highlighted sexual risk behaviors such as early onset of sexual debut, multiple sexual partners and unprotected intercourse as being linked to the increased rates of HIV/AIDS infection among young Africans. The correlation between high-risk behavior and HIV/AIDS knowledge are strongly related in the literature [28]. Thus despite educational initiatives, young Africans continue to represent more than half of all new HIV infections and still lack factual HIV transmission and prevention knowledge. Several descriptive studies have highlighted the increased rates of risky behaviors among this target population, which

further compounds their exposure to HIV/AIDS [29]. Research on socio-demographic situation and HIV/AIDS suggests that a person's Socio-demographic conditions may affect his or her likelihood of contracting HIV and developing AIDS [30,31].

Similarly positive associations of HIV infection with higher socioeconomic status have been observed in sub-Saharan Africa. However, as expected, controlling for urban/rural residence, sexual behavior and other factors that tend to be correlated with higher socioeconomic status diminished these associations considerably [32]. There are only a few studies that have assessed the level of comprehensive HIV/AIDS knowledge and behavior in-high school adolescents in Ethiopia. The available studies revealed that sexual debut during adolescence is associated with the risk of being HIV positive at later ages and that secondary school adolescents have the highest HIV positive proportion among the youth age groups in Ethiopia [33].

However, despite these important findings there is still a need for high quality studies that explore the specific barriers and facilitators of HIV transmission among male and female students [15,34]. Specific insights into these barriers and facilitators would yield important cues and future direction on how to implement age and gender specific HIV/AIDS awareness programs within Ethiopian high schools.

## **Theory Exploration: Theory of Planned Behavior**

The Theory of Planned Behavior (TPB) started as the Theory of Reasoned action in 1980 to predict an individual's intention to engage in a behavior at a specific time and place. The theory was intended to explain all behaviors over which people have the ability to exert self-control. The key component to this model is behavioral intent; behavioral intentions are influenced by the attitude about the likelihood that the behavior will have the expected outcome and the subjective evaluation of the risks and benefits of that outcome [35].

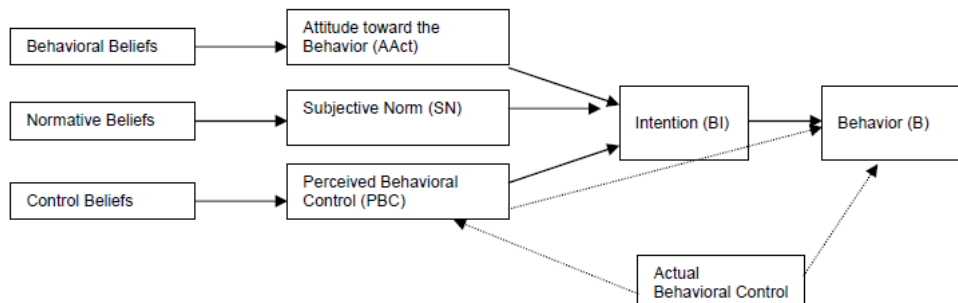
The TPB has been used successfully to predict and explain a wide range of health behaviors and intentions and it states that behavioral achievement depends on both motivation (intention) and ability (behavioral control) (Figures 1 and 2).

It distinguishes between three types of beliefs – behavioral, normative and control. Theory of Planned Behavior can be broken down into three conceptually independent antecedents leading to behavioral intention (BI): Attitude toward the Behavior (Aact), Perceived Behavioral Control (PBC) and Subjective Norms (SN) [36,37].

Attitude toward the behavior measures the degree to which a person has a negative or positive evaluation toward his/her performance of the behavior. Perceived Behavioral Control refers to people's perceptions of whether or not they can perform that specific behavior and how easy it is to perform. Subjective Norms refer to what individuals believe other key people in their lives think about whether or not the individual should perform the behavior. The perceived opinions of these key people help determine whether a person will actually perform the behavior [38].

Consequently, we used the extended form of theory of planned behavior for the present study as a conceptual framework by making modification to meet the intended purpose. We add knowledge as an additional variable in the theory in order to see the perceived behavioral control. We examine subjective norm and perceived behavioral control and we used socioeconomic status, gender and demographic data for the purpose of testing their correlation with the students HIV/AIDS attitude, knowledge and risk behavior. The student's attitude and knowledge directly influence their behavior and their actions. Socioeconomic status (SES),

### The Theory of Planned Behavior



Source: Ajzen, I. (2000). TpB Diagram. The theory of planned behavior. Retrieved Oct. 28, 2000 from the World Wide Web: <http://www-unix.oit.umass.edu/~ajzen/tpb.diag.html>

Figure 1: Diagram of the theory of planned behaviour.

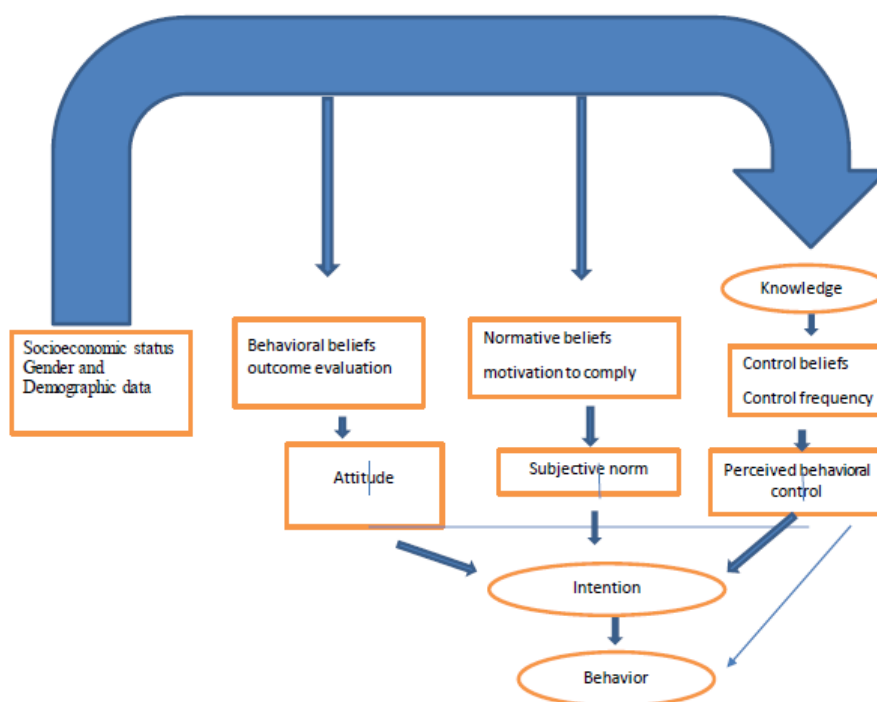


Figure 2: Adoption of theory of planned behaviour.

gender and demographic data are the potential variables that influence the level of knowledge, attitude and intention of student on HIV/AIDS. According to theory of planned behavior, intention has the power to predict behavior. High or low socioeconomic status, being socially male and female and the demographic data would result in high or low knowledge, positive or negative attitude and strong or weak intention to engage in HIV/AIDS risky behavior.

Studies on knowledge, attitude and behavior regarding HIV/AIDS among adolescents in Ethiopia are insufficient and we believe there must be a continuous assessment of the same. Hence, a clear understanding about knowledge, attitude and behavior among youngsters is essential

for planning activities to control or prevent the spread of HIV. So it is important to conduct this study among high school students in order to determine their knowledge, attitude and behavior regarding HIV/AIDS. Thus, the present study is intended to explore the predictors of behavior towards HIV/AIDS by taking knowledge, attitude, socioeconomic status, gender and demographic data as variables and as a result to determine the association among high students of Hawassa city.

## Methods

### Study area and design

Descriptive cross sectional study design was used. The respondents

were selected by multi-stage sampling procedure. To this effect the thirteen schools were first divided into four government schools and nine private schools. Among the four government schools, three were purposively selected. Two from the center of the city and one from the semi-rural setup and then five private schools were randomly selected out of the nine. Generally eight schools were selected to collect data among the thirteen high schools which covers 61.5% of the thirteen preparatory schools in Hawassa city administration.

### Study population and sampling procedure

The study population was high school students of Hawassa city administration mainly focusing on grade eleven and twelve. The process of selecting the real sample size followed multiple steps as described above from the total thirteen high schools in the city administration. With multistage sampling approach eight schools were selected. The sample size was determined using the following formula below: we decided the sample size. The total number of students in the thirteen schools was 7019.

$$N = n / (1 + N(e)^2)$$

Where n- is the sample size, N- the population size (total members size) and e- is the level of precision. N=7019, e=0.05.

$$N = \frac{7019}{1 + 7019(0.05)^2} = 378$$

The number of students from each school was allocated using proportional allocation to size method. To identify the study subject simple random sampling technique was used based on the developed sampling frame. Gender, age, socioeconomic status (parent's income, parent's level of education, house ownership), knowledge and attitude towards HIV, school type (private or government), migration (rural and urban), perceived behavioral control, subjective norm were the variables included in the questionnaire. The content, reliability and validity of the questionnaire were then assessed by well experienced colleagues for an acceptable accuracy. The questionnaire was pre-tested on 5% of the sample size among high school students at Tulla high school which is 9 km away from Hawassa and some corrections were made accordingly.

### Data Collection

Data was collected by self-administered questionnaire from study subjects in eight high schools of Hawassa city administration during school hours in 2015. The questionnaire had been developed by the principal investigator, adapting to the Ethiopian context from instruments used by previous similar studies [39,40]. The questionnaire was developed in English and then translated to the local language Amharic. The questionnaire was administered by three trained data collectors. It was handed directly to the study subjects by the data collectors and they were reassured of both anonymity and confidentiality. The students were told they could skip any question(s) they did not wish to answer and/or could discontinue completing the questionnaire at any point in time. The data collector read the questionnaire out loud while the students marked their responses on the questionnaires. The principal investigator was present to explain the question(s) if not understood by a student.

Knowledge, attitude, perceived behavioral control and subjective norm of all subjects was determined using different sections of the questionnaire. The questionnaire consisted of 36 questions and included five sections: Knowledge, attitude, perceived behavioral control, subjective norm and behavior assessment. A score of 0 was given for incorrect answer 1 point was given for each correct response and expressed as percentage. Average score of 75% or more was considered as adequate knowledge, favorable attitude, strong behavioral control, wanted subjective norm and good behavior. The grading table was designed by the researchers as there was no standard scoring table available in the literature (Table 1). Descriptive statistics was used to calculate percentages for each of the responses given. Each questionnaire was checked for completeness, missed values and unlikely responses and then manually cleaned up on such indications. Data was entered in Microsoft excel software, and analysis was performed using STATA version 12 analysis software.

### Data management, analysis and interpretation

Frequency distribution was performed for the demographic variables and socioeconomic status. Odds ratio (OR) was used to study the relationship and strength of association between the behavior of students and independent variables. Bivariate logistic regression analysis was used to identify the independent effect of gender, residence, age, type of school, socioeconomic status of parents, subjective norm and perceived behavioral control with the outcome variable using a cutoff point, p value ≤ 0.25. Those variables with p value ≤ 0.25 were offered into multivariable logistic regression model so as to avoid some of the common problems associated with the forward stepwise regression to build the final model and those variables with p value >0.05 were eliminated.

### Data quality assurance

Measurements and responses were crosschecked for missed, irregularities, inconsistencies and unlikely response based on which corrective measures were taken as required. To maintain the quality of the data and avoid any problem or suspicious data, the data collectors and the supervisor crosschecked by recollecting data from 5% of the study population. Data was collected by trained data collectors using a simplified, structured, self-administered questionnaire completed by students at their classroom. A self-administered questionnaire would offer participants greater freedom to express their attitudes when compared with the personal interview approach. The school management and teachers were approached at the beginning of the study and briefed on the study. Permission was obtained for students to take 15-20 min at the beginning of the class to complete the questionnaire. Students were instructed not to discuss the questions with their colleagues. Any queries, the trained data collectors and researchers helped. At the end of the session, the researcher checked the completed questionnaires for completeness and accuracy. The data collection instrument format was developed in English and translated to Amharic and later back translated to English by different individuals for its accuracy and desired results. The data collectors used structured questionnaire for interviewing students. One day training was given for data collectors.

Scores	Knowledge	Attitude	Perceived behavioral control	Subjective norm	Behavior
≥ 75%	Adequate	Favorable	Strong	Wanted	Good
<75%	Inadequate	Unfavorable	Weak	Unwanted	Not good

**Table 1:** The grading system used to classify high school students knowledge, attitude, perceived behavioral control and subjective norm on the assessment behavior of students towards HIV, Hawassa, 2015.

## Ethical Consideration

Ethical clearance was obtained from ethical clearance board of Hawassa University. Prior to data collection, all study participants were given information on the study and assured that all data is confidential and would only be analyzed as aggregates. All respondents gave informed consent by signing the consent form before participation.

## Results

### Socio-demographic characteristics of students

From a total of 378 students, 367 respondents completed the questionnaire giving a response rate of 97%. The number of participants from each high school were from Addis ketema 68 (18%), Tabor 172 (45.4%), Tula 13 (3.4%), SOS Hermann Geminer 12 (3.2%), BNB 21 (5.6%), South Adventist 11 (3%), Debus Ethiopia 43 (11.4%), Union academy 38 (10%). The majority of the participants 254 (69.2%) were within age range of 16-18 years and 185 (50.4%) were females. One hundred and ninety (190) students were in grade twelve constituting 51.8%, while 177 (48.2%) were grade eleven students (Table 2).

Variables	Frequency No. 367	Percentage % 100
<b>Schools</b>		
Addis ketema high school	68	18
Tabor high school	172	45.4
Tula high school	13	3.4
SOS Hermann Geminer high school	12	3.2
BNB high School	21	5.6
South Adventist high school	11	3
Debus Ethiopia high school	43	11.4
Union academy high school	38	10
<b>Age</b>		
<16 years	6	1.6
16-18 years	254	69.2
>18 years	107	29.2
<b>Sex</b>		
Male	182	49.6
Female	185	50.4
<b>School type</b>		
Government	237	64.6
Private	130	35.4
<b>Grade level</b>		
Eleven	177	48.2
Twelve	190	51.8
<b>Educational level of mothers</b>		
MSC and above	53	14.4
First degree	109	29.7
Diploma	51	13.9
High school	16	4.4
Upper Primary school	54	14.7
Primary school	54	14.7
No formal education	30	8.2
<b>Educational level of father</b>		
MSC and above	85	23.2
First degree	106	28.9
Diploma	36	9.8
High school	19	5.2
Upper Primary school	48	13.1

	Primary school	38	10.4
	No formal education	35	9.5
<b>Occupation of parents</b>			
	Farmers	40	10.9
	Government employee	160	43.6
	NGO employee	58	15.8
	Merchant	89	24.3
	Other	20	5.4
<b>Monthly income of parents in Eth. birr</b>			
	<1000	49	13.4
	1001-2000	62	16.9
	2001-4000	103	28.1
	4001-7500	68	18.5
	>7500	40	10.9
<b>Type of residence</b>			
	Their own house	281	76.6
	Rented house	54	14.7
	By sharing rooms	4	1.1
	Government house	27	7.4
	Illegal house/Chereka	1	0.3
<b>Major source of information about HIV</b>			
	I do not have	32	32
	Radio	107	107
	TV	107	107
	Satellite receiver	97	97
	other	24	24

Chereka: A type of house built without legal procedure from the municipality

**Table 2:** Socio-demographic characteristics of students at selected schools Hawassa town, April 2015.

### Student's knowledge on route of transmission and prevention of HIV

Participant's knowledge on HIV was probed using eighteen questions. Nearly 85.6% of the respondents have a knowledge about HIV being transmitted by sexual intercourse and 20.2% believed that HIV can be transmitted by shaking hands and 63.8% of participants know how to use condom properly. Similarly, 86.6% of participants know HIV can be prevented by properly using condom during sexual intercourse. Of the total respondents, 80.9% know that one prevent HIV by refraining from sex before marriage, and only 73.8% of them know that coughing and sneezing do not spread HIV. A total of 245 (66.8%) participants have adequate knowledge towards HIV route of transmission and prevention methods (Table 3).

Since standard knowledge measurement from previous articles was not available, a cut point result of greater than 75% and above as was used as an indicator of adequate knowledge and less than 75% as inadequate knowledge. That means those who responded correctly to 14 questions and above out of the 18 questions in the category; were considered as having adequate knowledge. As a result, in this study 66.49% (244) students have adequate knowledge about HIV/AIDS.

### Distribution of student's attitude towards HIV

Participant's attitude towards HIV/AIDS was probed using six questions. Eighty four percent (84%) of participants believe that people living with HIV/AIDS should be treated with the same respect

No.	Characteristics	Respond correctly		Respond incorrectly	
		No.	%	No.	%
1	A woman can get HIV if she has sex during her period	202	55	165	45
2	Coughing and sneezing do not spread HIV	271	73.8	96	26.2
3	A person cannot get HIV by sharing a glass of water with someone who has HIV	288	78.5	79	21.5
4	HIV can be transmitted by sexual intercourse	314	85.6	53	14.4
5	HIV can be transmitted from mother to child	308	83.9	59	16.1
6	HIV cannot be transmitted by shaking hand	293	79.8	74	20.2
7	HIV cannot be transmitted by eating and drinking from the same plate	300	81.7	67	18.3
8	HIV cannot be transmitted by sharing a toilet with an HIV-positive person	298	81.2	69	18.8
9	Showering, or washing one's genitals/private parts, after sex do not keep a person from getting HIV	302	82.3	65	17.7
10	HIV can be prevented by not sharing needle or syringe	293	79.8	74	20.2
11	HIV can be prevented by properly using condom during sexual intercourse	318	86.6	49	13.4
12	HIV transmission can be avoided by remaining faithful to a single partner	287	78.2	80	21.8
13	People who have been infected with HIV do not quickly show serious signs of being infected	263	71.7	104	28.3
14	There is no vaccine that can stop adults from getting HIV	291	79.3	76	20.7
15	There is a female condom that can help decrease a woman's chance of getting HIV	302	82.3	65	17.7
16	Among your friends if one of them becomes HIV positive, you are confident that you will give him/her love and care	298	81.2	68	18.5
17	By not having sex before marriage, you can prevent yourself from HIV	297	80.9	70	19.1
18	Do you know how to use condom properly?	234	63.8	133	36.2

Table 3: Distribution of student's knowledge on route of transmission and prevention of HIV Hawassa, April 2015.

No.	Characteristics	Respond correctly		Respond incorrectly	
		No.	%	No.	%
1	If your friend is HIV positive, would you continue your friendship with him/her?	251	68.4	116	31.6
2	If a shopkeeper or food seller is HIV positive, would you buy items from him/her?	278	75.7	89	24.3
3	If a student is HIV positive, she/he should be allowed to continue his/her studying in school?	302	82.3	65	17.7
4	Young children should not be removed from the home if one of the parents/caregivers are HIV positive	258	70.3	109	29.7
5	Do you like to do something to make life easier for people with HIV positive?	298	81.2	69	18.8
6	Patients with AIDS should be treated with the same respect as any other patient	306	83.4	61	16.6

Table 4: Distribution of attitude of students towards HIV, Hawassa, 2015.

No	Characteristics	Respond correctly		Respond incorrectly	
		No.	%	No.	%
1.	Haven't you ever had sexual intercourse?	206	56.1	161	43.9
2.	Have you ever use condom during sexual intercourse?	107	85	54	15
3.	Do you think your parents/caregivers will not be happy if you engage in sexual activity?	189	51.5	178	48.5
4.	Haven't you had sex when under the influence of alcohol or your peer?	118	32.2	249	67.8
5.	Do you think your friends are happy to use condom during sexual intercourse?	174	47.4	193	52.6
6.	Does parents/caregivers always encourage you to be faithful to your partner	257	70	110	30

Table 5: High school student's behavior towards HIV, Hawassa, April 2015.

as any other patient. Only 68% of the students said that they would continue their friendship if they know their friend is HIV positive. Study participants who scored more than 75% of attitude questions are considered as having favorable attitude. Thus, in this research the participant average score of favorable attitude towards HIV/AIDS was found to be 65.40% (240) (Table 4).

### Behavioral aspect of students towards HIV

About 43.9% (161) of the students have already started sexual intercourse. Among them 33.3% (54) of them do not ever use condom during sexual intercourse and 35.9% (57) of the students have an experience of sexual intercourse under the influence of alcohol and/or peer pressure. Nearly 70% (257) of the students have strong encouragement from their parents/caregivers to be faithful to their sexual partners. Overall, 57% of participants were found to have good

behavior towards HIV and considerable amount of students have risky behavior/practice which exposed them to HIV infection (Table 5).

### Distribution of perceived behavioral control

From the total participants 36% (102) of them do not know proper condom usage. The majority, 81% (297) of the participants have a confidence to give care and support if one of their friend becomes HIV positive. Hence, only 46% (169) of the participant show strong perceived behavioral control (Table 6).

### Distribution of subjective norm

The student's subjective norm was measured by using four questions. From the total students who started sexual intercourse (177), 36% (42) of them experienced some risky practice that may expose them to HIV infection with the influence of alcohol consumption and

No.	Characteristics	Respond correctly		Respond incorrectly	
		No.	%	No.	%
1.	Among your friends if one of them becomes HIV positive, are you confident to give him/her love and care	297	81	70	19
2.	By not having sex before marriage, one can prevent himself from HIV	260	71	107	29
3.	Do you know how to use condom properly	234	64	102	36

**Table 6:** Descriptive statistics result of perceived behavioral control of high school students towards HIV/AIDS, Hawassa, April 2015.

No.	Characteristics	Respond correctly		Respond incorrectly	
		No.	%	No.	%
1.	Do you think your parents/caregivers will not be happy if you engage in sexual activity?	189	51.5	178	48.5
2.	Haven't you had sex under the influence of alcohol or your peer?	118	32.2	249	67.8
3.	Do you think your friends are happy to use condom during sexual intercourse?	174	47.4	193	52.6
4.	My parents/caregivers always encourage me to be faithful to my partner	308	84	59	16

**Table 7:** Descriptive statistics result of subjective norm of high school students towards HIV/AIDS, Hawassa, April.

Variables	Behavior				OR	95% CI		P<0.05
	Good(N=259)		Not good(N=108)			Lower	Upper	
	N	%	N	%				
<b>Type of School</b>								
Government	162	68.4	75	31.65	1			
Private	97	74.6	33	25.38	1.36	0.84	2.20	0.209
<b>Grade level</b>								
Eleven	136	76.9	41	23.16	1			
Twelve	123	64.7	67	35.26	0.55	0.64	0.87	0.011
<b>Occupation of parents</b>								
Farmers	131		49	27.22	1			
Employee	76		31	28.97				
Merchant and others	52		28	35.00	1.18	0.89	1.50	0.226
<b>House type</b>								
Cement house	129	74.6	44	25.43	1			
Mud house	114	69.94	49	30.06				
Shade house	16	51.6	15	48.39	0.66	0.46	0.94	0.022
<b>Parental situation</b>								
Biological parents	28	62.2	17	37.78	1			
Care giver	231	71.7	91	28.26	0.64	0.33	1.24	0.192
<b>Perceived behavioral control</b>								
Weak	124	62.6	74	37.37	1			
Strong	135	79.8	34	20.12	2.36	1.43	3.80	0.000

**Table 8:** Bivariate analysis of socio demographic variables subjective norm and perceived behavioral control with the behavior of high school students towards HIV/AIDS, Hawassa 2015.

or peer pressure. Majority of participants have a positive influence from their parents to be faithful to their sexual partners. Hence 78.5% (288) of the participant show wanted subjective norm (Table 7).

### Bivariate analysis of socio demographic variables with the behavior of high school students towards HIV/AIDS

The Bivariate analysis of socio economic and demographic variables with the behavior of students towards HIV revealed the odds of having good behavior is reduced by 36% among those students who show weak behavioral control at  $p < 0.01$ . The odds of having good behavior increased by 55% among grade twelve students as compared to grade eleven students at  $p < 0.05$ . But the remaining variables do not show significant statistical association with the behavior of students. Therefore all significant variables;  $p < 0.25$  were taken for further multivariate analysis (Table 8).

### Correlation between HIV/AIDS knowledge and attitude with behavior students

The relationship between HIV/AIDS knowledge and attitude with

behavior of students using Bivariate logistic regression analysis shows that; the odds of having good behavior among respondents having adequate knowledge is twice greater than those with inadequate knowledge at  $p < 0.01$  and also the odds of having good behavior among students having favorable attitude towards HIV showed much higher than those with unfavorable attitude at  $p < 0.01$  (Table 9).

### Multivariate analysis

On multivariable Logistic regression analysis only one factor is found statistically significant, at ( $p < 0.05$ ) by a full model which contains eleven variables. The analysis shows that the student's behavior is significantly affected only by the attitude of students. Those study participants who have favorable attitude showed 69% of the odds of having much better behavior towards HIV ( $p < 0.001$ ) (Table 10).

### Discussion

This study, conducted among high school students attending grade eleven and twelve in Hawassa, revealed substantial association

Variables	Behavior				OR	95% CI		P
	Good (N=259)		Not good (N=108)			Lower	Upper	
	N	%	N	%				
<b>Over all knowledge on HIV</b>								
Inadequate knowledge	51	41.80	71	58.20	1			
Adequate Knowledge	208	84.90	37	15.10	7.82	4.73	12.92	0.000
<b>Attitude</b>								
Unfavorable	20	16.1	104	83.87	1			
Favorable	239	98.4	4	1.65	310.69	103.63	931.46	0.000

**Table 9:** Multivariate analysis of behavior of preparatory students in relation to knowledge and attitude, Hawassa, Ethiopia 2015.

No.	Variables	AOR	95% CI	P
1.	<b>Attitude</b>			
	Unfavorable	1		
	Favorable	310.69	(103.63, 931.46)	0.000

**Table 10:** Adjusted estimate of the association between students behavior with risk factors multiple logistic regressions, Hawassa, Ethiopia 2015.

of attitude towards HIV with the behavior of students. The level of HIV/AIDS knowledge among the subjects is adequate, as indicated by a correct response rate in the present study of 66.8%. This finding is similar with other studies [20,41]. To the contrary, low level of HIV knowledge among students is reported by other studies [18,23]. Although HIV/AIDS knowledge did not demonstrate statistically significant relationship with the behavior of students in this study, the result of previous studies suggests the need of HIV knowledge education for the general population of students.

A comparable report of attitude was found in Ethiopia [18,27] which is consistent on other settings [19]. The observed relationships between attitude and behavior of students were consistent with other studies. One possible explanation for this association is, since attitude is one of the important factors for the behavioral intention of students; according to the theory of planned behavior, those students who have favorable attitude such as a firm stand on refraining from sex before marriage had not yet had the opportunity or the desire to engage in sex and thus develop the ability to control their sexual behavior that may direct them to develop preventive behavior from HIV. As behavioral intention is the antecedent of attitude it has an ability to influence the intention of a student to a lifestyle activity and action that may place a student to some risk of acquiring or preventing HIV infection. More over HIV prevention among students can be augmented by creating favorable attitude of students.

On the other hand vast majority of students in this study reported that the major source of HIV information is Radio and TV; similar finding is reported by other studies [8]. This finding is inconsistent with the finding among Thai students where the majority of the respondents received various HIV/AIDS related information from teachers and parents [42]. This indicates little communication regarding HIV occurred between students and their parents or teachers; that may suggest the importance of involving parents and teachers with students concerning HIV; which may help them to educate themselves and the students. This finding emphasizes the importance and urgency for initiating targeted interventions for high school students and the community on creating favorable attitude towards HIV in the study area.

## Conclusion and Recommendation

The findings of this study indicate the need for enhanced HIV risk reduction by shaping students behavior in a way that prevent HIV infection; which is sensitive mainly to the attitude of the students. The

level of attitude among high school students in the current study area was good as compared with other similar studies. Even if majority of respondents have favorable attitude towards HIV/AIDS, quiet a number respondent's show inadequate knowledge towards prevention and route of transmission of HIV/AIDS. This shows that they did not extend their knowledge on prevention and control of HIV infection among students of high school age. This fact and the significant association of attitude that may impact behavioral intention with the behavior of students calls the need for training students, teachers and parents and also adequately integrating the issue of HIV, gender, sexuality and preparing relevant health courses in high school curriculum to address not only the medical aspects of HIV but also the social components, related with the deadly virus HIV.

In addition, awareness creation on HIV/AIDS route of transmission, prevention methods and strengthening of the existing anti HIV/AIDS clubs and youth friendly services with necessary training is also important. Further research on the views of school teachers and students' perception and knowledge on HIV and sexuality education is required in order to implement the prevention and control activity of HIV among high school students effectively.

## Author's Contribution

All authors made a substantial contribution to the conception and design of this study and have been involved in drafting the manuscript and revising it critically for important intellectual content.

## Limitations of the Study

Variability of questions in different researches and lack of standard cut off point used to measure the knowledge; attitude and behavior of students remain the limitation of this study.

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