Addis Ababa University

College of Health Science

School of Public Health

Predictors of late HIV diagnosis among people living with HIV in Adare and Yirgalem general hospitals, SNNPR, Ethiopia: a case control study

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Abbreviations and Acronyms

AAU	Addis Ababa University
AIDS	Acquired Immuno Deficiency Syndrome
ART	Anti-retroviral Treatment
EDHS	Ethiopian Demographic and Health Survey
HAART	Highly Active Anti Retroviral Treatment
HCT	HIV Counseling and Testing
HIV	Human Immuno Deficiency Virus
Km	Kilometer
PITC	Provider Initiated Testing and Counseling
SPH	School of Public Health
USA	United States of America
WHO	World Health Organization

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Abstract

Introduction: Even if early diagnosis, access to treatment and ensuring people living with HIV to receive ongoing care and treatment is one of the most effective ways to prevent the further spread of HIV and to protect the health of those living with the virus, lack of knowledge of HIV status is a major barrier to HIV prevention, care and treatment efforts. This is because; the majorities of people with HIV who do not know they are infected, for a variety of reasons, came late for diagnosis and lately linked for care resulting in different negative outcomes.

Objective: The objective of this study was to identify predictors for late HIV diagnosis among people living with HIV in Adare and Yirgalem general hospitals, SNNPR, Ethiopia.

Method: Facility based unmatched case-control study design was used in the study and a total sample size of 438 (216 cases and 222 controls) were recruited from clients who were visiting the ART clinics of Adare hospitals and Yirgalem general Hospital from 10th February to 16th April, 2014. Cases were HIV positive individuals who have a CD4 cell count of ≤350/µl regardless of the clinical staging or WHO clinical stage III or IV regardless of their CD4 cell count at the time of diagnosis., while controls were HIV positive individuals who have CD4 cell count of >350/µl and WHO clinical stage I or II at the time diagnosis. Data was collected by trained ART clinic nurses of the respective hospitals through card review and face to face interview. Binary logistic regression and multiple logistic regression analysis were carried out to identify predictors of late HIV diagnosis. Data were presented using frequencies, percentages, odds ratio with 95% confidence interval.

Results: Among the study participants 117 (54.2%) of cases and 71 (32.0%) of controls were males and with the mean and standard deviation of age 31.87±7.94 years among cases and 28.92±7.27 years among controls. Males, (Adjusted OR= 1.869, 95 % CI 1.159, 3.015) , older age (≥ 40 years), (Adjusted OR= 2.681, 95 % CI 1.203, 5.973), tested for illness/symptom, (Adjusted OR= 2.019, 95 % CI 1.091, 3.735) and opportunistic illness at diagnosis (Adjusted OR= 2.249, 95 % CI 1.448, 3.496) were independent predictors for late HIV diagnosis; whereas having lifetime sexual partner six and above (≥ 6) was associated with early presentation for diagnosis (Adjusted OR= 0.213, 95 % CI 0.068, 0.668).

Conclusion and recommendation: Males, old age, testing due to symptom and opportunistic infection at diagnosis were independent predictors of late HIV diagnosis, whereas having lifetime sexual partner six and above have protective effect. The HIV prevention and control efforts and HIV testing programs should target males as well as older age groups and promoting routine HIV testing as part of regular medical care may contribute to the reduction of late HIV diagnosis. Further large scale study should be done including patients not attending ART clinic and clients visiting health facility with unknown HIV status.

1. Introduction

1.1 Background

Globally, 35.3 million people were living with human immunodeficiency virus (HIV) and 1.6 million people died from acquired immune deficiency syndrome (AIDS) and there were 2.3 million new HIV infections in 2012. The epidemic continues to disproportionately affect sub-Saharan Africa, home to 70% of all new HIV infections in 2012 (1).

Acquired Immune Deficiency Syndrome (AIDS) is also one of the most serious public health and development challenges in Ethiopia and it is affecting all sectors of Ethiopian society. According to the 2011 EDHS, 1.5 percent of adults age 15-49 were infected with HIV and heterosexual contact accounts for the great majority of HIV transmission in the country and six in every ten Ethiopians have never been tested for HIV (2).

HIV Counseling and Testing (HCT) is the main entry point to prevention, care, treatment and support services, where people are helped to be aware of their HIV status, and counseled to understand the implications of their HIV status and make informed choices for the future (3).

Early diagnosis, access to treatment and ensuring people living with HIV to receive ongoing care and treatment is one of the most effective ways to prevent the further spread of HIV and to protect the health of those living with the virus (4).

Late diagnosis and late initiation of highly active antiretroviral therapy (HAART) is associated with: increased hospital admission (5)**,** increased HIV related mortality shorter survival (6, 7, 8), increased healthcare costs (9, 10) and increase risk of transmission (11).

Generally late diagnosis is a major contributory factor to the continued incidence of AIDS and mortality among HIV-infected individuals, and is an important obstacle to the effective prevention of the further spread of infection (11).

1.2 Statement of the problem and rationale

Over half of new sexually transmitted HIV infections in the USA stem from the 25% of the infected persons in the US who do not know they are infected (12), and lack of knowledge of HIV status is a major barrier to HIV prevention, care and treatment efforts (4, 13).

Despite the evidenced benefit of knowing HIV status early, a significant proportion of HIV infected patients come late for diagnosis in different countries across the world including Ethiopia: 31% in Texas, USA (14), 55.2% in Italy (15), 37.3% in South Korea (16), 33.6% in Durban, South Africa (17), 65% in Mukono district, Uganda (18), and 61.8% South Wollo, Ethiopia (19).

In Ethiopia HIV counseling and testing (HCT) services are integrated into existing health and social welfare service and Provider Initiated Testing and Counseling (PITC) is integrated as part of standard clinical management and care in all health facilities to enhance earlier diagnosis and timely presentation for care (3).

Even though earlier diagnosis of HIV gives opportunity to reduce onward transmission either by encouraging safer sexual behaviour, or by reducing an individual's infectiveness through the use of HAART (11), more than half of HIV patients diagnosed late according to the study in Ethiopia (19) and factors for late HIV diagnosis are not well evidenced in Ethiopia.

Therefore, this study has attempted to identify predictors of late HIV diagnosis. This will help planners and responsible bodies working on the prevention and control of HIV/AIDS to focus on the identified factors and take an intervention in order to allow an earlier diagnosis and initiation of antiretroviral treatment and ultimately to decrease HIV- related morbidity and mortality as well as HIV transmission.

2. Literature Review

HIV weakens the immune system, making the body susceptible to secondary and opportunistic infections. Without treatment, HIV infection leads to AIDS and death. The predominant mode of HIV transmission is through sexual contact. Other modes of transmission are mother-to-child transmission, use of contaminated blood supplies for transfusions, and injections using contaminated needles or syringes. (2)

According to the 2011 EDHS, 1.5 percent of adults age 15-49 are infected with HIV and Heterosexual contact accounts for the great majority of HIV transmission in the country. AIDS is now affecting all sectors of Ethiopian society. The future course of the AIDS epidemic in Ethiopia depends on a number of factors including HIV/AIDS-related knowledge, social stigmatisation, risk behaviour modification, access to high-quality services for sexually transmitted infections (STIs), provision and uptake of HIV counselling and testing, and access to ART. (2)

There are three aproaches for HIV testing in Ethiopia: (3)

1. Client-initiated, or voluntary counselling and testing
2. Provider-initiated testing and counselling
3. Mandatory HIV screening

Factors associated with late HIV diagnosis

2.1 Socio-demographic factors

Different socio demographic factors are associated with late HIV diagnosis as reported by different studies. Males were found to have a higher rate for late diagnosis as revealed by studies from different Europe, Asian and African countries (14, 15, 20, 21). In addition to sex older age group people have a higher rate of late diagnosis compared with younger age group people (14-16, 18, 20), however, study done in San Francisco showed late diagnosis to occur in younger age groups (22).

Place of residence has also an association with late diagnosis for HIV. A study in South Africa reported that those residing in a rural area had higher rate of being presented late during their first HIV diagnosis as compared to those living in urban area (17).

Marital status, occupational status, socioeconomic status and ownership of living house were also identified as factors associated with late HIV diagnosis (18, 20, 23). A study in Singapore reported that singlehood compared to persons who are married, or divorced, separated or widowed and non professional occupation are at increased odds of late diagnosis (23). Similarly a study in Mukono District Uganda revealed not being married is a significant predictor for late testing (18). A case-case comparison study in Venezuela also reported that having low socio economic status and living in a rental residence are more likely to be diagnosed late as compared to those having high socio economic status and living in their own residence respectively (20). A study in South Wollo Zone, Northern Ethiopia also showed that people who were living with their families compared to those living alone were at higher risk of late presentation for care (24).

2.2 Knowledge, beliefs & attitudes about HIV/AIDS and perceived stigma

Knowledge of HIV/AIDS is among the determinant factors associated with late HIV diagnosis. This is indicated in case-case comparison study in Venezuela that identified low knowledge of HIV/AIDS being the main barriers to HIV testing (20). Having negative beliefs towards knowing one's HIV sero status are associated with late diagnosis according to a study in Uganda (18).

Individuals with stigmatizing attitudes toward people living with HIV and AIDS were less likely to have been tested for HIV/AIDS according to a study in Botswana (25). A study in south Wollo, Ethiopia showed that having high perceived HIV stigma as an independent predictor of late HIV presentation for care (24).

2.3 HIV risk perception, reason for testing and HIV risk behavior

HIV risk perception is among the factors associated with late HIV diagnosis. People, in US, who are more likely to be diagnosed late with HIV usually, do not consider themselves as "risk categories" (26), another studies done in Venezuela (20), Botswana (25) and Zimbabwe (27) also claim that those who have felt being at risk were less likely to come late for

diagnosis. Similarly, persons without a reported risk in San Francisco, California, were more likely late diagnosed as compared to those who had reported risk at diagnosis (22).

A study in New Zealand also showed that people diagnosed for the reason of risk and screening, as compared to diagnosis due to the presence of symptoms, were less at risk of being diagnosed late for HIV (28). In a primary healthcare based study in South Korea, it was reported that the proportion of individuals being diagnosed late was higher among individuals tested due to clinical symptoms as compared to those tested for health check-up (16).

HIV transmission through heterosexual contact, particularly with non spouse partner, was among HIV risky behaviors which are associated with an increased risk of late HIV testing (29). In addition, alcohol use is another risky behavior associated with risk of late presentation to HIV/AIDS diagnosis (18). Conversely those who have large number of sexual partner were less likely to be diagnosed late according to the study in France (30).

2.4 Healthcare facility, health seeking behaviour and medical history

Poor access to HIV testing is found to be a risk factor for late HIV diagnosis in Washington State, US (26), which is supported by a case-case comparison study in Venezuela that living in a longer distance (≥25km) from a health care facility is a risk factor for late diagnosis (20). Similarly, a cross-sectional study conducted in South Africa indicated that participants who lived ≥5 kilometers from the test site had higher risk of late-stage HIV disease presentation at first diagnosis as compared to those living within 5km distance from the health facility (17). Having no knowledge of testing services is also indicated on study in Uganda as a risk factor for late testing (18).

Source of past medical care, existence of opportunistic infection, history of sexually transmitted disease and no history of HIV testing were also identified as risk factors for late HIV testing in different studies (21, 22, 31). Receiving care in a non-medical setting (home, traditional healer and/or drug stores), as shown by a study in Uganda, had also increased the risk of being diagnosed late compared to receiving no health care (31). In addition, a study in Southern Thailand indicated that the presence of reported history of sexually transmitted disease and drugstore as a source of care for general illness were associated with late HIV diagnosis (21). Similarly, a study conducted in San Francisco depicted that initial AIDS

diagnosis with an opportunistic infection was found to be a risk factor for late diagnosis (22). Not having previous HIV testing were more likely to be diagnosed late as evidenced in a hospital based study in Southern Thailand (21).

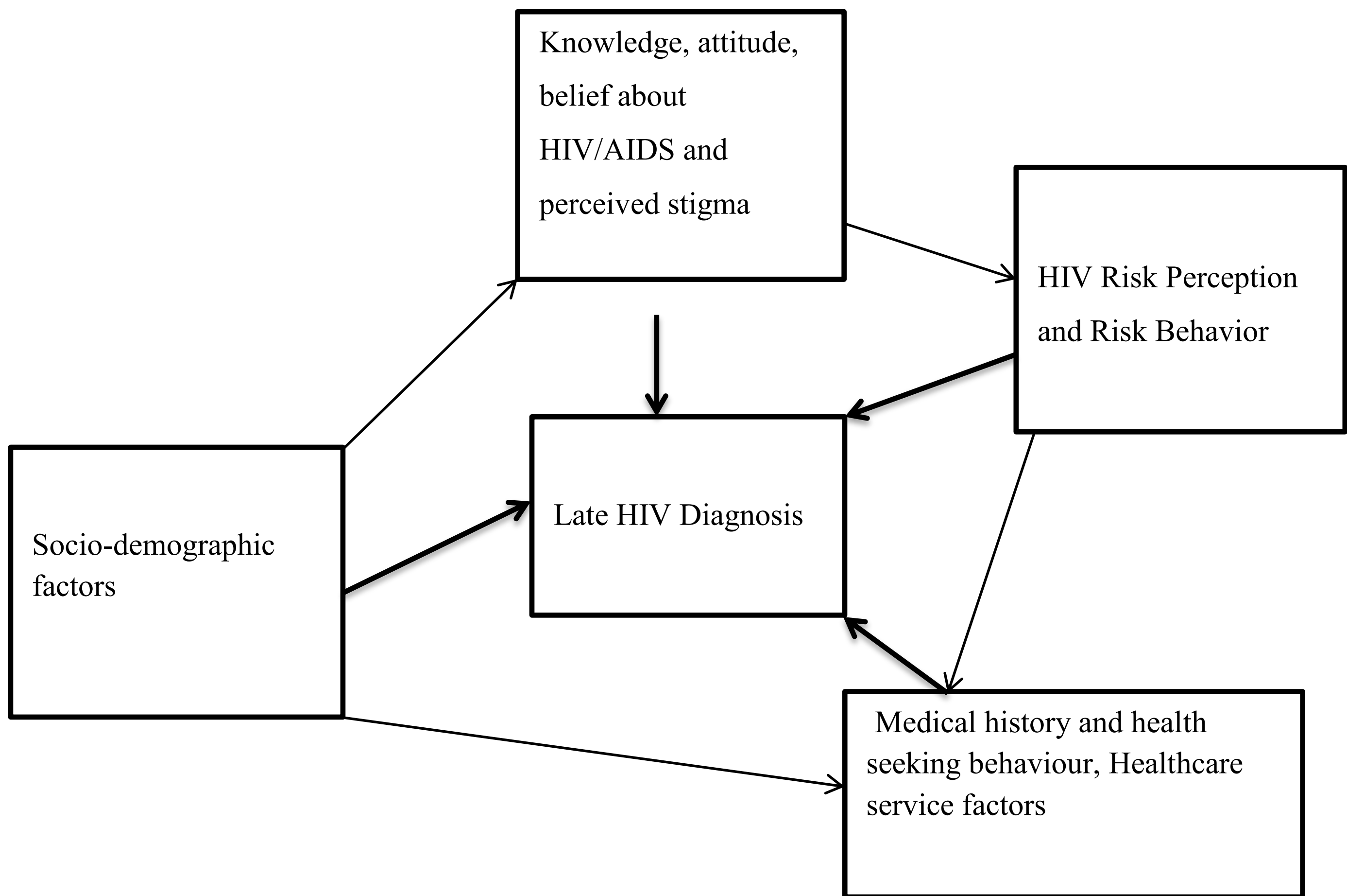

Figure 1: Conceptual framework for late HIV diagnosis based on the reviewed literatures

3. Objective

The objective of this study was to identify predictors of late HIV diagnosis among people living with HIV in Adare and Yirgalem general hospital, SNNPR, Ethiopia.

4. Method

4.1 Study design

Facility based unmatched case control study design was used.

4.2 Study Area and period

This study was conducted in Adare and Yirgalem general hospitals (public hospitals), SNNPR, Ethiopia. Adare hospital is found in Hawassa city, the capital of SNNPR. The city is found 274 km south of the capital Addis Ababa along Addis Abba- Moyale main road. Adare hospital has around 2457 clients on ART care service at the time of data collection. Whereas Yirgalem hospital, which is found in Yirgalem town, located 310 km south of Addis Ababa and 42 KM from Hawassa has a total of 5534 clients on ART care service. The study was conducted in the period ranging from 10th February to 16th April, 2014.

4.3 Source and Study Population

The source population:

All HIV/AIDS patients who visited the ART clinics of Adare and Yirgalem general hospitals

The study population:

HIV/AIDS patients who were diagnosed after September 2012 and visited the ART clinics of Adare and Yirgalem general hospitals during the data collection period

Cases: HIV positive individuals who have a CD4 cell count of $\leq$350/µl regardless of the clinical staging or WHO clinical stage III or IV regardless of their CD4 cell count at the time of diagnosis.

Controls: HIV positive individuals who have CD4 cell count of >350/µl and WHO clinical staging I or II.

Inclusion and exclusion criteria

Inclusion criteria: All people living with HIV, age 18 years and above, who were diagnosed at Adare and Yirgalem hospitals after September 2012 and visiting ART clinic of the respective Hospitals during data collection period were included in the study.

Exclusion Criteria: Patient's whose CD4 cell count unavailable at diagnosis; those who are unconscious and severely ill were excluded.

4.4 Sample size

The sample size is calculated using Statcalc of Epi info version 3.5.1 software package by considering the following assumptions: 17.2% of controls spend at least one hour travelling to testing center with odds ratio of 2 which is taken from previous study as an independent predictor for late HIV diagnosis which gives maximum sample size (18), 95% CL, 80% power and case to control ratio of 1:1. This gives a total sample size of 410 (205 cases and 205 controls). By taking 10% non response rate, the final sample size was about 452 (226 cases and 226 controls).

4.5 Sampling procedures

The total sample size was proportionally allocated to the two hospitals (Adare and Yirgalem general hospitals) based on the size of the ART clients in the hospitals who were diagnosed after September 2012 (2005 E.C). There were a total of 359 clients in Adare hospital and 275 clients in Yirgalem hospital who were diagnosed after September 2012 and registered on ART clinic at the start of data collection. After making a proportional allocation to the total number of ART clinic clients who were diagnosed after September 2012 of the respective hospitals, a total of 256 study subjects (128 cases and 128 controls) were recruited from Adare hospital and the rest 196 study subjects (98 cases and 98 controls) were recruited from Yirgalem hospital. With the aim of using systematic sampling technique the sampling interval was calculated to give (K= 1.4), therefore every consecutive visitors were recruited until the calculated sample size was achieved at both hospitals.

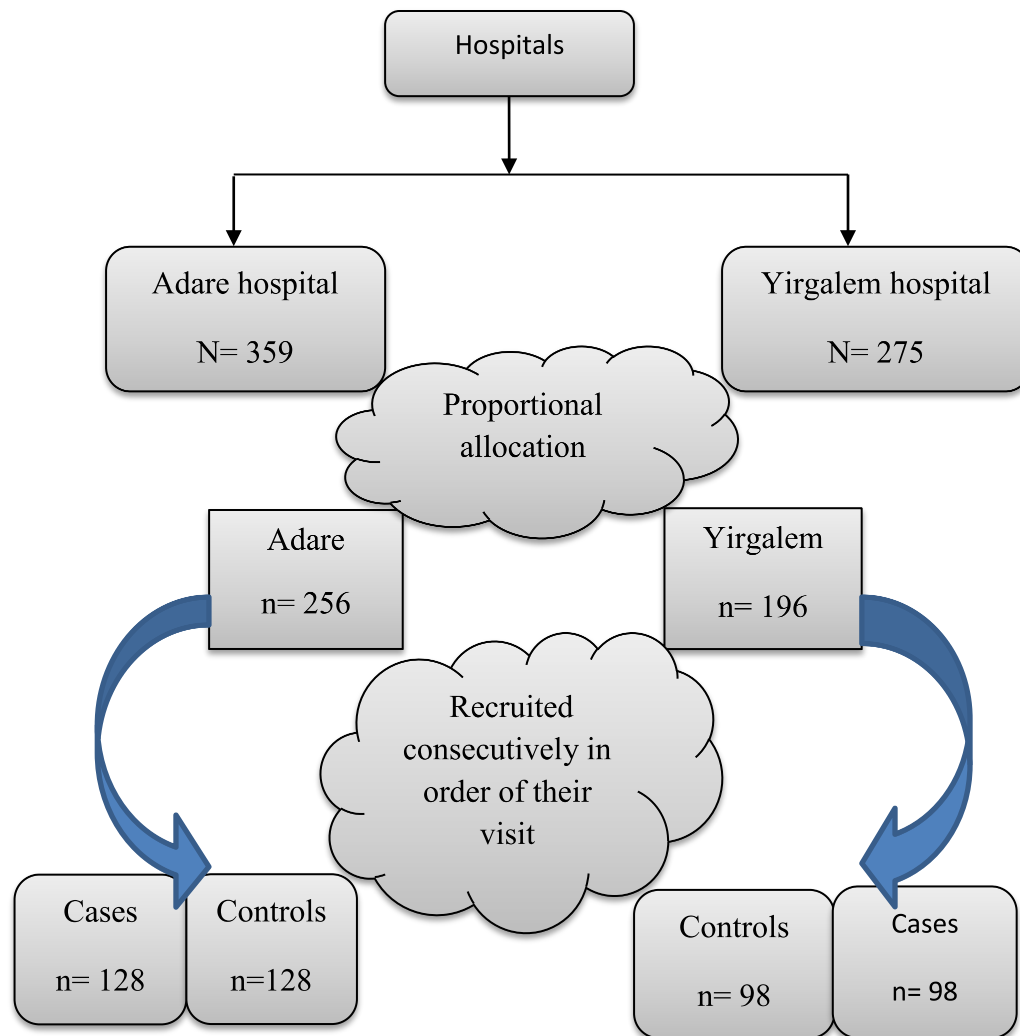

Figure 2: Schematic presentation of sampling technique and sample of cases and controls among people living with HIV from Adare and Yirgalem hospitals, 2014

4.6 Study variables

Dependent variable

- Late HIV diagnosis

Independent variables

- Socio-demographic characteristics
  - Sex
  - Age
  - Place of residence
  - Religion
  - Marital status
  - Educational status
  - Living arrangement
  - Occupation
  - Ownership of living house
- Knowledge, Attitude and belief about HIV/AIDS
- Perceived HIV stigma
- HIV Risk Perception
- Reason for testing
- Mode of Acquisition
- HIV Risk Behavior
  - Medical history and Healthcare service factors
    - History of hospital admission
    - Presence of opportunistic and sexually transmitted illness
    - Source of medical care for past illness
    - Distance of living home from the health facility
    - Reported trust of confidentiality on HIV testing service in the health facility
    - Testing experience

Operational definitions

Late HIV diagnosis= an initial presentation for diagnosis with a CD4 cell count ≤350/µl or AIDS (WHO clinical stage 3 or stage 4 disease) (32, 33).

HIV risk perception= feelings about the chance that one have HIV.

HIV risk behavior= the habit of participants' frequent exposure to factors that increase unsafe sex and risk of HIV acquisition.

4.7 Data collection procedures

Instrument and personnel

A total of two supervisors and four ART nurses were recruited for data collection and pre tested structured questionnaire which was developed after reviewing relevant literatures on the issue was used. The questionnaire consists of socio-demographic factors, knowledge, attitude and belief about HIV/AIDS, perceived HIV stigma, HIV risk perception and risky behaviors, medical history, health seeking behaviour and factors related to Healthcare service. The questionnaire was at first prepared in English language and then was translated to Amharic and back translated to English to maintain consistency. The data was collected through face to face interview and record review (mainly for CD4 count at diagnosis, age and records of opportunistic infection at diagnosis).

4.8 Data quality management

Training was given for the data collectors about the objective of the study, method used and contents of the questionnaire by the principal investigator. Pretesting on 5 % of the total sample size was undergone in Hawassa referral hospital to identify potential problems that will arise during the actual data collection period and identified problems were amended accordingly. Completeness, accuracy and consistency of the collected data were checked during data collection by the supervisors and the principal investigator. Data were coded before data entry.

4.9 Data processing and analysis

All questionnaires were coded, entered in Epi Info version 3.5.1 software package and exported to SPSS version 21 software for cleaning and analysis.

Binary logistic regression analysis was done for each independent variable, and independent variables with a p-value ≤ 0.2 were included in the final model for multiple logistic regression analysis. Independent variables with a p-value < 0.05 in the final model were considered as independent and significant predictors for late HIV diagnosis and crude and adjusted odds ratio with 95% confidence interval was presented.

Knowledge, attitude, belief about HIV & AIDS and perceived HIV stigma was measured based on total scores of indicator questions (2, 34, 35), Comprehensive knowledge about HIV & AIDS was measured using five indicator questions and Participants who answered all of the five items correctly was considered as having comprehensive knowledge about HIV/AIDS, while, the rest was taken as not having it. Attitude about HIV & AIDS was assessed using four indicator questions and dichotomized based on the mean score as positive attitude for those scored greater than or equal to the mean score and negative attitude for those scored less than the mean score. Belief about HIV & AIDS was determined by five "yes/no" indicator questions. One point was given for "correct responses" and zero point for "incorrect one". Thus, the total score will range from [0-5]. Score less than the mean score of the study population was considered as having "poor" belief and score greater or equal to the mean was considered as having "good" belief. Perceived stigma was also measured using fourteen "yes/no" indicator questions and responses indicating presence of perceived stigma was given 1 point, while responses indicating absence of perceived stigma was given zero point. The total score of individual participants ranges from [0-14]. Score less than the mean score of the study population was categorized as having "low" perceived stigma and score greater than or equal to the mean was categorized as having "high" perceived stigma.

4.10 Ethical consideration

Ethical clearance was obtained from ethical review committee of Addis Ababa University College of Health Sciences, School of Public Health.

Permission letters was also taken from Hawassa city administration Health bureau and Yirgalem hospital medical director.

Data collectors were recruited only from staffs of ART clinic to avoid disclosure of their status to a 3rd person and interview was held in a separate free room near the ART clinic so as to keep their privacy. During the data collection process, the data collectors informed each study participant about the purpose, anticipated benefits and harms/discomforts of the research project and assured them that their name will not be used and confidentiality of information will be kept and participation in the study is absolutely based on their free willingness and as they have full right to refuse, withdraw at any time from their participation and finally their voluntariness to participate was asked. Then, written consent was obtained for their willingness for participation.

4.11 Dissemination of results

The result of the study will be submitted to School of Public Health, College of health sciences, Addis Ababa University. The study finding will also be disseminated to HIV prevention and control offices of the respective city/town. Presentations on national meetings and publication in scientific journal and online dissemination will be considered.

5. Results

5.1 Socio-demographic characteristics

Out of a total sample size of 452, 438 (216 cases and 222 controls) participated in this study making the response rate 97%.

One hundred seventeen (54.2%) of cases and 71 (32.0%) of controls were males. Thirty eight (17.6%) of cases and 56 (25.2%) of controls were with in an age interval of [18-24], 56 (25.9%) of cases and 77 (34.7%) of controls were with in an age interval of [25-29], 52 (24.1%) of cases and 50 (22.5%) of controls are with in an age interval of [30-34], 28 (13.0%) of cases and 20 (9.0%) of controls are with in an age interval of [35-39] and the rest 42 (19.4%) of cases and 19 (8.6%) of controls were forty (40) and above with the mean and standard deviation of age 31.87 ± 7.94 years among cases and 28.92 ± 7.27 years among controls.

Majority of study subjects, 175 (81.0%) of cases and 188 (84.7%) of controls were urban resident and the rest were rural residents. The religion of the study subjects showed that 118 (54.6%) of cases and 111 (50.0%) of controls were orthodox Christians and 75 (34.7%) of cases and 91 (41.0%) of controls were protestant Christians and others constitute the rest (Muslims and Catholics). The ethnic group of the study participants were Sidama, 38 (17.6%) among cases and 49 (22.1%) among controls; Wolayta, 53 (24.5%) among cases and 64 (28.8%) among controls; Amhara, 65 (30.1%) among cases and 57 (25.7%) among controls; Oromo, 26 (12.7%) among cases and 21 (9.5%) among controls and the rest, 34 (15.7%) among cases and 31 (14.0%) among controls were others (Gurage, Hadya, Kembata and Tigre).

Marital status of the study groups were married 102 (47.2%) among cases and 106 (47.7%) among controls, never married 40 (18.5%) among cases and 51 (23.0%) among controls, divorced/separated 43 (19.9%) among cases and 39 (17.6%) among controls, widowed 31 (14.4%) among cases and 26 (11.7%) among controls. Fifty three (24.5%) of cases and 47 (21.2%) of controls live with their family, 45 (20.8%) of cases and 63 (28.4%) of controls lives alone, 96 (44.4%) of cases and 92 (41.4%) of controls live with their Husband or wife, the rest live with others.

Thirty four (15.7%) of cases and 42 (18.9%) of controls have no formal education; 113 (52.3%) of cases and 120 (54.1%) of controls were in primary education; 36 (16.7%) of cases and 31

(14.0%) of controls were in secondary education; the rest 33 (15.3%) of cases and 29 (13.1%) of controls were in tertiary educational level. With regard to occupation 42 (19.4%) of cases and 43 (19.4%) of controls were unemployed, 53 (24.5%) of cases and 39 (17.6%) of controls were government employed, 50 (23.1%) of case and 45 (20.3%) of controls were merchants, 50 (23.1%) of cases and 63 (28.4%) of controls were daily laborers and the rest were others (farmers, students and drivers, CSW). Eighty eight (40.7%) of cases and 80 (36.0%) of controls own their living house and the rest lives in a rental house. (Table 1)

Table 1**:** The Socio-demographic characteristic of study participants, Adare and Yirgalem hospitals, 2014

Variables		Cases n (%)	Controls n (%)
Sex	Male	117 (54.2)	71 (32.0)
	Female	99 (45.8)	151 (68.0)
Age at first diagnosis			
	18-24	38 (17.6)	56 (25.2)
	25-29	56 (25.9)	77 (34.7)
	30-34	52 (24.1)	50 (22.5)
	35-39	28 (13.0)	20 (9.0)
	≥40	42 (19.4)	19 (8.6)
Place of residence			
	Urban	175 (81.0)	188 (84.7)
	Rural	41 (19.0)	34 (15.3)
Religion			
	Orthodox	118 (54.6)	111 (50.0)
	Protestant	75 (34.7)	91 (41.0)
	Others	23 (10.6)	20 (9.0)
Ethnicity			
	Sidama	38 (17.6)	49 (22.1)
	Wolayta	53 (24.5)	64 (28.8)
	Amhara	65 (30.1)	57 (25.7)
	Oromo	26 (12.0)	21 (9.5)
	Other	34 (15.7)	31 (14.0)
Marital status			
	Never married	40 (18.5)	51 (23.0)
	Married	102 (47.2)	106 (47.7)
	Divorced/separated	43 (19.9)	39 (17.6)
	Widowed	31 (14.4)	26 (11.7)
Living arrangement			
	Family	53(24.5)	47 (21.2)
	Alone	45(20.8)	63 (28.4)
	Husband/wife	96(44.4)	92 (41.4%)
	Other	22(10.2)	20 (9.0)
Educational status			
	No formal educ.	34 (15.7)	42 (18.9)
	Primary	113 (52.3)	120 (54.1)
	Secondary	36 (16.7)	31 (14.0)
	Tertiary	33 (15.3)	29 (13.1)
Occupational status			
	Unemployed	42 (19.4)	43 (19.4)
	Gov. employed	53 (24.5)	39 (17.6)
	Merchants	50 (23.1)	45 (20.3)
	Daily laborers	50 (23.1)	63 (28.4)
	Others	21 (9.7)	32 (14.4)

Ownership of living house		
Owning	88 (40.7)	80 (36.0)
Renting	128 (59.3)	142 (64.0)

5.2 Knowledge, attitude and belief about HIV/AIDS and perceived stigma

Sixty two (28.7%) of cases and 75 (33.8%) of controls have comprehensive knowledge about HIV & AIDS. One hundred five (48.6%) of cases and 97 (43.7%) of controls have positive attitude towards HIV & AIDS. Poor belief about HIV & AIDS was 102 (47.2%) among cases and 100 (45.0%) among controls. One hundred six (49.1%) of cases and 120 (54.1%) of controls have low perceived stigma. (Table 2)

Table 2: The knowledge, attitude & belief about HIV & AIDS and perceived stigma of study participants, Adare and Yirgalem hospitals, 2014

Variables	Cases n (%)	Controls n (%)
Have comprehensive knowledge about HIV &AIDS		
Yes	62 (28.7)	75 (33.8)
No	154 (71.3)	147 (66.2)
Attitude about HIV&AIDS		
Positive	105 (48.6)	97 (43.7)
Negative	111 (51.4)	125 (56.3)
Belief about HIV&AIDS		
Poor	102 (47.2)	100 (45.0)
Good	114 (52.8)	122 (55.0)
Perceived stigma		
Low	106 (49.1)	120 (54.1)
High	110 (50.9)	102 (45.9)

5.3 Risk perception, reason for testing and risk behaviours

Majority of cases, 176 (81.5%), and controls, 160 (72.1%), have had no risk perception. When they are asked about reason for testing 23 (10.6%) of cases and 51 (23.0%) of controls were tested for screening; majority 161 (74.5%) of cases and 121 (54.5%) of controls were tested for having symptoms and the remaining 32 (14.8%) of cases and 50 (22.5%) of controls were tested for having risk exposure. One hundred eighty one (83.8%) of cases and 193 (86.9%) of controls claim heterosexual contact as the mode of acquisition, while the rest 35 (16.2%) of cases and 29 (13.1%) of controls claim sharing sharp material as their mode of acquisition.

Seventy nine (36.6%) of cases and 71 (32.0%) of controls claim to have one lifetime sexual partner, 69 (31.9%) of cases and 67 (30.2%) of controls claim to have two to three (2-3) life time sexual partner and 35 (16.2%) of cases and 36 (16.2%) of controls claim to have four to five (4-5) lifetime sexual partner while 20 (9.3%) of cases and 38 (17.1%) of controls have six and above life time sexual partners; the rest 13 (6.0%) of cases and 10 (4.5%) of controls have no sexual partners. Among those who have sexual partners, the type of relationship with latest partner in 112 (55.2%) of cases and 123 (58.0%) of controls were spouse; 52 (25.6%) of cases and 58 (27.4%) of controls were steady and the remaining 39 (19.2%) of cases and 31 (14.6%) of controls were causal/onetime. Twenty seven (13.3%) of cases and 31 (14.6%) of controls knows HIV status of their latest partner as negative and 32 (15.8%) of cases and 25 (11.8%) of controls knows HIV status of their latest partner as positive whereas the remaining majority of cases 144 (70.9%) and controls 156 (73.6%) did not know the HIV status of their latest partner. Majority of both study subjects 154 (75.9%) of cases and 168 (79.2%) of controls never discussed risk of HIV infection with their latest partner. Those who always use condom with their latest partner were 8 (3.9%) among cases and 11 (5.2%) among controls, 47 (23.2%) of cases and 55 (25.9%) among controls use sometimes and the rest 148 (72.9%) of cases and 146 (68.9%) of controls never used condom with their latest partner. Nine (4.4%) of cases and 11 (5.2%) of controls reported paid/being paid for sexual intercourse and those who reported drug use were 4 (1.9%) among cases and 3 (1.4%) among controls. Never drink alcohol was 133 (61.6%) among cases and 160 (72.1%) among controls, never khat chewing was 161 (74.5%) among cases and 173 (77.9%) among controls and never smoking was 188 (87.0%) among cases and 202 (91.0%) among controls. (Table 3)

Table 3: Risk perception, reason for testing and risk behaviours of study participants, Adare and Yirgalem hospitals, 2014

Variables	Cases n (%)	Controls n (%)
Risk perception		
Yes	40 (18.5)	62 (27.9)
No	176 (81.5)	160 (72.1)
Reason for testing		
Screening	23 (10.6)	51 (23.0)
Symptoms	161 (74.5)	121 (54.5)
Risk exposure	32 (14.8)	50 (22.5)
mode of HIV acquisition		
Heterosexual contact	181 (83.8)	193 (86.9)
Sharing sharp materials	35 (16.2)	29 (13.1)
No of life time sexual partners		
None	13 (6.0)	10 (4.5)
1	79 (36.6)	71 (32.0)
2-3	69 (31.9)	67 (30.2)
4-5	35 (16.2)	36 (16.2)
≥6	20 (9.3)	38 (17.1)
Type of r/ship with latest partner		
Spouse	112 (55.2)	123 (58.0)
steady partner	52 (25.6)	58 (27.4)
Casual/one time	39 (19.2)	31 (14.6)
HIV status of latest partner		
Negative	27 (13.3)	31 (14.6)
Positive	32 (15.8)	25 (11.8)
Don't know	144 (70.9)	156 (73.6)
Ever discussed risk of HIV infection with latest partner		
Yes	49 (24.1)	44 (20.8)
No	154 (75.9)	168 (79.2)
Condom use with latest partner		
Always	8 (3.9)	11 (5.2)
Sometimes	47 (23.2)	55 (25.9)
Never	148 (72.9)	146 (68.9)
Paid/being paid for sexual intercourse		
Yes	9 (4.4)	11 (5.2)
No	194 (95.6)	201 (94.8)
Drug use		
Yes	4 (1.9)	3 (1.4)
No	112 (98.1)	119 (98.6)
alcohol consumption		
Never	133 (61.6)	160 (72.1)
Sometimes	65 (30.1)	53 (23.9)
Always	18 (8.3)	9 (4.1)

Khat chewing		
Never	161 (74.5)	173 (77.9)
Sometimes	35 (16.2)	32 (14.4)
Always	20 (9.3)	17 (7.7)
Cigarette smoking		
Never	188 (87.0)	202 (91.0)
Sometimes	17 (7.9)	13 (5.9)
Always	11 (5.1)	7 (3.2)

5.4 Medical history, health seeking behaviour and healthcare service situation of the study participants

One hundred ninety one (88.4%) of cases and 200 (90.1%) of controls ever received treatment in a medical clinic. Majority 188 (87.0%) of cases and 201 (90.5%) of controls ever received treatment in a drug store/pharmacy. Ever received treatment by traditional healer were 31 (14.4%) among cases and 24 (10.8%) among controls. Ever admitted to hospital were 44 (20.4%) among cases and 42 (18.9%) among controls. Majority 147 (68.1%) of cases and 99 (44.6%) of controls had opportunistic infection at diagnosis. Ever infected with sexually transmitted diseases were 29 (13.4%) among cases and 36 (16.2%) among controls.

One hundred eighty four (85.2%) of cases and 32 (14.8%) of controls travel less than one hour to health care facility whereas 182 (82.0%) of cases and 40 (18.0%) of controls travel at least one hour to health care facility. Majority 153(70.8%) of cases and 161 (72.5%) of controls were aware of existence of HIV testing service and it's for free in public health facility, while 44 (20.4%) of cases and 50 (22.5%) of controls were aware of existence but not for free in public health facility. The remaining 19 (8.8%) of cases and 11 (5.0%) of controls were not aware of existence of HIV testing service in the health facility. Majority of the study participants, 197 (91.2%) of cases and 208 (93.7%) of controls had trust on confidentiality of testing site. Twenty five (11.6%) of cases and 38 (17.1%) of controls were tested for HIV before their diagnosis. (Table 4)

Table 4: Medical History, health seeking behaviour and healthcare service situation of study participants, Adare and Yirgalem hospitals, 2014

Variables	Cases n (%)	Controls n (%)
Received treatment in a medical clinic		
Yes	191 (88.4)	200 (90.1)
No	25 (11.6)	22 (9.9)
Received treatment in a drugstore/pharmacy		
Yes	188 (87.0)	201 (90.5)
No	28 (13.0)	21 (9.5)
Ever treated by traditional healer		
Yes	31 (14.4)	24 (10.8)
No	185 (85.6)	198 (89.2)
Ever admitted to a hospital		
Yes	44 (20.4)	42 (18.9)
No	172 (79.6)	180 (81.1)
Any Opportunistic Illness at diagnosis		
Yes	147 (68.1)	99 (44.6)
No	69 (31.9)	123 (55.4)
Infected with STDs		
Yes	29 (13.4)	36 (16.2)
No	187 (86.6)	186 (83.8)
Distance from home to health care facility.		
< 60 minutes	184 (85.2)	182 (82.0)
≥ 60 minutes	32 (14.8)	40 (18.0)
Awareness of HIV test		
Not aware of existence	19 (8.8)	11 (5.0)
Exists but not for free	44 (20.4)	50 (22.5)
Exists and for free	153 (70.8)	161 (72.5)
Trust on confidentiality of testing site		
Yes	197 (91.2)	208 (93.7)
No	19 (8.8)	14 (6.3)
History of HIV testing		
Yes	25 (11.6)	38 (17.1)
No	191 (88.4)	184 (82.9)

5.5 Bivariate analysis of socio-demographic characteristics with late HIV diagnosis

Comparison of socio-demographic characteristics with cases and controls was made crudely and there was no difference among cases and controls in place of residence, religion, ethnicity, marital status, living arrangement, educational status, occupation and ownership of living house. However the likelihood to present late for diagnosis on males was 2.5 time higher compared to females (Crude OR= 2.513, 95% CI 1.704, 3.708) and compared to age group [18-24], there is a two fold increase risk of presenting late for diagnosis on age group [35-39] (Crude OR= 2.063, 95% CI 1.018, 4.181) and 3 fold increased risk on age group 40 and above (Crude OR= 3.258, 95% CI 1.649, 6.435). (Table 5)

Table 5: Bivariate analysis of socio-demographic characteristics with late HIV diagnosis among study participants, Adare and Yirgalem hospitals, 2014

Variables	Cases n (%)	Controls n (%)	Crude OR (95 % CI)
Sex			
Male	117 (54.2)	71 (32.0)	2.513 (1.704, 3.708)*
Female	99 (45.8)	151 (68.0)	1
Age at first diagnosis			
18-24	38 (17.6)	56 (25.2)	1
25-29	56 (25.9)	77 (34.7)	1.072 (0.627, 1.833)
30-34	52 (24.1)	50 (22.5)	1.533 (0.870, 2.699)
35-39	28 (13.0)	20 (9.0)	2.063 (1.018, 4.181)*
$\geq$40	42 (19.4)	19 (8.6)	3.258 (1.649, 6.435)*
Place of residence			
Urban	175 (81.0)	188 (84.7)	1
Rural	41 (19.0)	34 (15.3)	1.295 (0.786, 2.134)
Religion			
Orthodox	118 (54.6)	111 (50.0)	0.924 (0.481, 1.776)
Protestant	75 (34.7)	91 (41.0)	0.717 (0.366, 1.404)
Others	23 (10.6)	20 (9.0)	1
Ethnicity			
Sidama	38 (17.6)	49 (22.1)	0.707 (0.371, 1.348)
Wolayta	53 (24.5)	64 (28.8)	0.755 (0.411, 1.387)
Amhara	65 (30.1)	57 (25.7)	1.040 (0.569, 1.900)
Oromo	26 (12.0)	21 (9.5)	1.129 (0.531, 2.398)
Other	34 (15.7)	31 (14.0)	1
Marital status			
Never married	40 (18.5)	51 (23.0)	1
Married	102 (47.2)	106 (47.7)	1.227 (0.748, 2.013)
Divorced/separated	43 (19.9)	39 (17.6)	1.406 (0.771, 2.560)
Widowed	31 (14.4)	26 (11.7)	1.520 (0.781, 2.958)
Living arrangement			
Family	53 (24.5)	47 (21.2)	1.025 (0.498, 2.110)
Alone	45 (20.8)	63 (28.4)	0.649 (0.317, 1.329)
Husband/wife	96 (44.4)	92 (41.4)	0.949 (0.486, 1.853)
Other	22 (10.2)	20 (9.0)	1
Educational status			
No formal educ.	34 (15.7)	42 (18.9)	0.711 (0.363, 1.395)
Primary	113 (52.3)	120 (54.1)	0.828 (0.472, 1.450)
Secondary	36 (16.7)	31 (14.0)	1.021 (0.511, 2.040)
Tertiary	33 (15.3)	29 (13.1)	1
Occupational status			
Unemployed	42 (19.4)	43 (19.4)	1
Gov. employed	53 (24.5)	39 (17.6)	1.391 (0.769, 2.518)
Merchants	50 (23.1)	45 (20.3)	1.138 (0.633, 2.043)
Daily laborers	50 (23.1)	63 (28.4)	0.813 (0.462, 1.429)
Others	21 (9.7)	32 (14.4)	0.672 (0.335, 1.347)

Ownership of living house			
Owning	88 (40.7)	80 (36.0)	1
Renting	128 (59.3)	142 (64.0)	0.819 (0.557, 1.205)

* p-value <0.05

5.6 Bivariate analysis of knowledge, attitude, belief about HIV&AIDS and perceived stigma with late HIV diagnosis

Comparison of cases with controls was made on their comprehensive knowledge, attitude, belief about HIV& AIDS and perceived stigma crudely and none of them have shown significant difference. (Table 6)

Table 6: Bivariate analysis of knowledge, attitude, belief about HIV&AIDS and perceived stigma with late HIV diagnosis among study participants, Adare and Yirgalem hospitals, 2014

Variables	Cases n (%)	Controls n (%)	Crude OR (95 % CI)
Comprehensive knowledge about HIV & AIDS			
Yes	62 (28.7)	75 (33.8)	1
No	154 (71.3)	147 (66.2)	1.267 (0.845, 1.901)
Attitude about HIV& AIDS			
Positive	105 (48.6)	97 (43.7)	1
Negative	111 (51.4)	125 (56.3)	0.820 (0.563, 1.195)
Belief about HIV& AIDS			
Poor	102 (47.2)	100 (45.0)	1
Good	114 (52.8)	122 (55.0)	0.916 (0.629, 1.334)
Perceived stigma			
Low	106 (49.1)	120 (54.1)	1
High	110 (50.9)	102 (45.9)	1.221 (0.839, 1.777)

5.7 Bivariate analysis of risk perception, reason for testing and risk behaviours with late HIV diagnosis

Those who felt at risk of HIV infection were about 40% less likely to present late for diagnosis compared to those who felt no risk (crude OR= 0.587, 95% CI 0.373, 0.921). The odds of late diagnosis is almost 3 times higher among those who tested for illness/symptoms as testing reason than screening. (Crude OR= 2.950, 95 % CI 1.709, 5.093).

There is no significant difference among cases and controls in mode of acquisition, lifetime sexual partner, type of relationship with latest partner, HIV status of latest partner, ever discussed risk of HIV infection with latest partner, use of condom with latest partner, paid/being paid for sexual intercourse, history of khat chewing and cigarette smoking but there is a significant difference among cases and controls by alcohol consumption. Those who always drink alcohol were 2.4 times more likely to present late compared to those who never drink alcohol. (Crude OR= 2.406, 95 % CI 1.046, 5.532). (Table 7)

Table 7: Bivariate analysis of risk perception, reason for testing, and risk behaviours with late HIV diagnosis among study participants, Adare and Yirgalem hospitals, 2014

Variables	Cases n (%)	Controls n (%)	Crude OR (95 % CI)
Risk perception			
Yes	40 (18.5)	62 (27.9)	0.587 (0.373, 0.921)*
No	176 (81.5)	160 (72.1)	1
Reason for testing			
Screening	23 (10.6)	51(23.0)	1
Symptoms	161 (74.5)	121(54.5)	2.950 (1.709, 5.093)*
Risk exposure	32 (14.8)	50(22.5)	1.419 (0.731, 2.753)
mode of HIV acquisition			
Heterosexual contact	181 (83.8)	193 (86.9)	1
Sharing sharp materials	35 (16.2)	29 (13.1)	1.287 (0.756, 2.191)
No of life time sexual partners			
None	13 (6.0)	10 (4.5)	1
1	79 (36.6)	71 (32.0)	0.856 (0.353, 2.073)
2-3	69 (31.9)	67 (30.2)	0.792 (0.325, 1.930)
4-5	35 (16.2)	36 (16.2)	0.748 (0.290, 1.927)
≥6	20 (9.3)	38 (17.1)	0.405 (0.151, 1.086)**
Type of r/ship with latest partner			
Spouse			
steady partner	112(55.2)	123(58)	1
Casual/one time	52(25.6)	58(27.4)	0.985(0.626,1.550)
	39(19.2)	31(14.6)	1.382(0.808,2.363)
HIV status of latest partner			
Negative	27(13.3)	31(14.6)	0.944(0.537,1.658)
Positive	32(15.8)	25(11.8)	1.387(0.784,2.452)
Don't know	144(70.9)	156(73.6)	1
Ever discussed risk of HIV infection with latest partner			
Yes	49 (24.1)	44 (20.8)	1
No	154 (75.9)	168 (79.2)	0.823 (0.519, 1.307)
Condom use with latest partner			
Always	8 (3.9)	11 (5.2)	0.717 (0.281, 1.835)
Sometimes	47 (23.2)	55 (25.9)	0.843 (0.537, 1.324)
Never	148 (72.9)	146 (68.9)	1
Paid/being paid for sexual intercourse			
Yes	9 (4.4)	11 (5.2)	0.848 (0.344, 2.091)
No	194 (95.6)	201 (94.8)	1
Alcohol consumption			
Never	133 (61.6)	160 (72.1)	1
Sometimes	65 (30.1)	53 (23.9)	1.475(0.960, 2.267)
Always	18 (8.3)	9 (4.1)	2.406(1.046, 5.532)*
Khat chewing			

Never	161 (74.5)	173 (77.9)	1
Sometimes	35 (16.2)	32 (14.4)	1.175 (0.695, 1.987)
Always	20 (9.3)	17 (7.7)	1.264 (0.640, 2.498)
Cigarette smoking			
Never	188 (87)	202 (91)	1
Sometimes	17 (7.9)	13 (5.9)	1.405 (0.664, 2.971)
Always	11 (5.1)	7 (3.2)	1.688 (0.641, 4.446)

* p-value <0.05, ** p-value ≤0.2

5.9 Bivariate Analysis of medical history, health seeking behaviour and healthcare service facilities factors with late HIV diagnosis

There was no statistical significant difference among cases and controls on ever receiving treatment in a medical clinic, drugstore/pharmacy, and traditional healer, admitted to hospital and infected with sexually transmitted diseases; however opportunistic infection at diagnosis have shown a significant difference among cases and controls; the odds of late presentation for those who have opportunistic infection at diagnosis is 2.6 times higher than those who do not have opportunistic infection at diagnosis (crude OR= 2.647, 95 % CI 1.793, 3.908).

Distance from home to health care facility, awareness of HIV test and trust on confidentiality of testing site and history of HIV test have no significant difference among the cases and the controls. (Table 8)

Table 8: Bivariate analysis of medical history, health seeking behaviour and healthcare service facility factors with late HIV diagnosis among study participants, Adare and Yirgalem hospitals, 2014

Variables	Cases n (%)	Controls n (%)	Crude OR (95 % CI)
Ever received treatment in a medical clinic	191 (88.4)	200 (90.1)	1
Yes	25 (11.6)	22 (9.9)	1.190 (0.649, 2.182)
No			
Ever received treatment in drugstore/ pharmacy			
Yes	188 (87)	201 (90.5)	0.701 (0.385, 1.278)
No	28 (13)	21 (9.5)	1
Ever treated by traditional healer			
Yes	31 (14.4)	24 (10.8)	1.382 (0.782, 2.443)
No	185 (85.6)	198 (89.2)	1
Ever admitted to a hospital			
Yes	44 (20.4)	42 (18.9)	1
No	172 (79.6)	180 (81.1)	0.912 (0.569, 1.462)
Any opportunistic Illness at diagnosis			
Yes	147 (68.1)	99 (44.6)	2.647 (1.793, 3.908)*
No	69 (31.9)	123 (55.4)	1
Ever infected with STDs			
Yes	29 (13.4)	36 (16.2)	0.801 (0.472, 1.361)
No	187 (86.6)	186 (83.8)	1
Distance from home to health care facility.			
<60 minutes	184 (85.2)	182 (82)	1
≥60 minutes	32 (14.8)	40 (18)	0.791 (0.476, 1.315)
Awareness of HIV test			
Not aware of existence	19 (8.8)	11 (5)	1.818 (0.838, 3.945)**
Exists but not for free	44 (20.4)	50 (22.5)	0.926 (0.584, 1.469)
Exists and for free	153 (70.8)	161 (72.5)	1
Trust on confidentiality of testing site			
Yes			
No	197 (91.2)	208 (93.7)	1
	19 (8.8)	14 (6.3)	1.433 (0.699, 2.936)
History of HIV testing			
Yes	25 (11.6)	38 (17.1)	0.634 (0.368, 1.092)**
No	191 (88.4)	184 (82.9)	1

* p-value <0.05, ** p-value ≤0.2

5.10 Independent predictors associated with late HIV diagnosis

After adjusting for Variables to each other on multivariate analysis the result showed that sex, age, reason for testing, number of lifetime sexual partners, opportunistic illness at diagnosis have significant difference among cases and controls and risk perception, alcohol consumption, and awareness of HIV testing service and history of HIV testing showed no significant difference among the cases and controls.

Males were 1.9 times more likely to present late for diagnosis compared to females (Adjusted OR= 1.869, 95 % CI 1.159, 3.015). Older ages [≥ 40] were 2.7 times more likely to present late (Adjusted OR= 2.681, 95 % CI 1.203, 5.973) compared to age group [18-24]. Those who were tested for the reason of symptoms were 2 times more likely to present late for diagnosis compared to those who tested for screening (Adjusted OR= 2.019, 95 % CI 1.091, 3.735). Those who had life time sexual partner of six and above were 79% less likely to present late compared to those who had no sexual partner (Adjusted OR= 0.213, 95 % CI 0.068, 0.668) and those who have had opportunistic infection at diagnosis were 2.2 times more likely to present late compared to those who have not had opportunistic infection at diagnosis (Adjusted OR= 2.249, 95 % CI 1.448, 3.496). (Table 9)

Table 9: Multivariate analysis in identifying predictors related with late HIV diagnosis among study participants, Adare and Yirgalem hospitals, 2014

Variables	Case n (%)	Control n (%)	Crude OR (95 % CI)	Adjusted OR (95 % CI)
Sex				
Male	117 (54.2)	71 (32)	2.513 (1.704, 3.708)	1.869 (1.159, 3.015)*
Female	99 (45.8)	151 (68)	1	1
Age at first diagnosis				
18-24	38 (17.6)	56 (25.2)	1	1
25-29	56 (25.9)	77 (34.7)	1.072 (0.627, 1.833)	1.012 (0.528, 1.940)
30-34	52 (24.1)	50 (22.5)	1.533 (0.870, 2.699)	1.441 (0.724, 2.866)
35-39	28 (13.0)	20 (9.0)	2.063 (1.018, 4.181)	1.769 (0.763, 4.101)
≥40	42 (19.4)	19 (8.6)	3.258 (1.649, 6.435)	2.681 (1.203, 5.973)*
Risk perception				
Yes	40 (18.5)	62 (27.9)	0.587 (0.373, 0.921)	0.610 (0.371, 1.005)
No	176 (81.5)	160 (72.1)	1	1
Reason for testing				
Screening	23 (10.6)	51 (23)	1	1
Symptoms	161 (74.5)	121 (54.5)	2.950 (1.709, 5.093)	2.019 (1.091, 3.735)*
Risk exposure	32 (14.8)	50 (22.5)	1.419 (0.731, 2.753)	1.287 (0.622, 2.664)
No of life time sexual partners				
None	13 (6.0)	10 (4.5)	1	1
1	79 (36.6)	71 (32.0)	0.856 (0.353, 2.073)	0.431 (0.150, 1.242)
2-3	69 (31.9)	67 (30.2)	0.792 (0.325, 1.930)	0.477 (0.168, 1.353)
4-5	35 (16.2)	36 (16.2)	0.748 (0.290, 1.927)	0.489 (0.162, 1.475)
≥6	20 (9.3)	38 (17.1)	0.405 (0.151, 1.086)	0.213 (0.068, 0.668)*
Alcohol consumption				
Never	133 (61.6)	160 (72.1)	1	1
Sometimes	65 (30.1)	53 (23.9)	1.475 (0.960, 2.267)	1.191 (0.713, 1.991)
Always	18 (8.3)	9 (4.1)	2.406 (1.046, 5.532)	1.483 (0.570, 3.859)
Opportunistic illness at diagnosis				
Yes	147 (68.1)	99 (44.6)	2.647 (1.793, 3.908)	2.249 (1.448, 3.496)*
No	69 (31.9)	123 (55.4)	1	1
Awareness of HIV test				
Not aware of existence	19 (8.8)	11 (5.0)	1.818 (0.838, 3.945)	1.153 (0.479, 2.774)
Exists but not for free	44 (20.4)	50 (22.5)	0.926 (0.584, 1.469)	1.025 (0.601, 1.749)
Exists and for free	153 (70.8)	161 (72.5)	1	1
History of HIV testing				
Yes	25 (11.6)	38 (17.1)	0.634 (0.368, 1.092)	0.783, (0.424, 1.448)
No	191 (88.4)	184 (82.9)	1	1

* P< 0.05 where taken as significantly associated with late HIV diagnosis after adjusting for Sex, Age at first diagnosis, Risk perception, reason for testing, no of lifetime sexual partner, Alcohol consumption, Opportunistic infection at diagnosis, Awareness of HIV test and History of HV testing.

6. Discussion

The definition of late presentation for diagnosis has evolved with the change in guideline. Different studies done at different time across the world use different definitions for late presentation for diagnosis and the choice of the definition may affect the proportion of individuals who present late. In this study late presentation for diagnosis was defined based on the cutoff point to initiate ART according to the 2010 revised WHO recommendation (36), which Ethiopia has adopted in the year 2012; when clients present for diagnosis at the time they are supposed to be on ART. Similar definitions were used in different studies elsewhere (10, 15, 26, 28, 37).

This study has attempted to look at several factors like; socio-demographic, knowledge, attitude, belief about HIV & AIDS and perceived stigma, risk perception and risk behaviours, medical history, health seeking behaviour and healthcare service factors. The results have showed that male sex, older ages [≥ 40 years], tested for illness/symptom and opportunistic illness at diagnosis were independent predictors for late HIV diagnosis; while having lifetime sexual partner six and above (≥ 6) is associated with early presentation for diagnosis.

After controlling the effect of other variables in multiple regression model, this study have shown that the odds of late diagnosis was 1.9 times more likely to occur on males compared to females (Adjusted OR= 1.869 with 95 % CI, 1.159, 3.015). Other studies finding also consistently showed that males have higher likelihood of presenting late for diagnosis (14, 17, 20, 21). Routine offer of HIV testing during antenatal care may explain the lower likelihood of women presenting late for diagnosis.

With regard to age this study revealed that late presentation in older age groups [≥ 40 years] appear to be 2.7 times higher than younger age groups [18–24 years] (Adjusted OR= 2.681 with 95 % CI, 1.203, 5.973). The occurrence of such finding is consistent with study in Korea (16), Italy (15), Venezuela (20), Texas (14), moreover, the study which is conducted in Uganda also shows that the likelihood of late presentation in older age groups is higher than that of younger age groups (18). However, this is different from the study done in San Francisco which revealed an increased likelihood of late testing among younger age groups at the time of diagnosis (22). The possible explanation for the finding in this study is that either older individuals are less

likely to get tested regularly or may be more immunocompromised and more likely to develop AIDS once infected resulting in lower CD4 count at diagnosis.

The association between late diagnosis of HIV and reason for testing showed that those who were tested for the reason of illness/symptoms have two fold increased probability of presenting late compared to those who tested for the reason of screening and proofed to be statistically significant after controlling for other variables. (Adjusted OR=2.019, with 95 % CI, 1.091, 3.735). A study done in Singapore also reveals Persons detected in the course of medical care had higher likelihood of presenting at late stage of infection that those detected through screening (23). Further more, similar study done in South Korea showed the proportion of individuals with a late diagnosis was higher in individuals tested due to clinical symptoms compared to general health check-up (16). The possible explanation for this result may be that most people go to health facility and seek testing after the progression of disease results in health problems.

Compared to having no sexual partner, those who have had six and above (≥ 6) sexual partners have about 79 % less likely to present late for HIV diagnosis (Adjusted OR= 0.213, with 95 % CI 0.068, 0.668). Similar study done in France showed that late presentation was less likely among individuals with large number of sexual partners (30). This finding is can be explained by that, the more the person have sexual partners, their may be feeling of being at risk and seek for testing and Risk perception was indicated as motivator of testing in studies done in Venezuela (20), Botswana, (25) and Zimbabwe (27). This study also indicated that the proportion of those who felt at risk were 18.5 % among cases and 27.9 % among controls, which showed a protective significant difference on bivariate analysis even though the majority of both study groups have had no feeling of being at risk.

This study also revealed that opportunistic infection has relation with late HIV diagnosis. There was a higher likelihood of late presentation on those having opportunistic infection at the time of diagnosis compared to those who did not have opportunistic infection at the time of diagnosis (Adjusted OR= 2.249, with 95 % CI, 1.448, 3.496) . Similarly study done in San Francisco showed consistent finding that persons whose AIDS diagnosis included an opportunistic illness were more likely to be late testers (22). This can be explained by the fact that the occurrence of

opportunistic infections is an indication of weakened immune system due to the attack of immune cells by the HIV virus resulting in lower CD4 count and it could imply presentation after progression of the disease.

Strengths and limitations of the study

Strength of the study

- ✓ The use of case control study design to assess factors associated with late diagnosis could be a good aspect of the study.

Limitations of the study

- ✓ The use different definition across different studies could affect the comparability.
- ✓ Most of the data was based on self-report and most questions related to the time before or at diagnosis, thus subjected to recall bias.
- ✓ Social desirability bias.
- ✓ The analyses of late presentation for diagnosis may not represent the characteristics of HIV positives who did not attend ART clinic.

7. Conclusion and Recommendation

The findings of this study indicated that males and older age ($\geq$ 40 years) at high risk of presenting late for diagnosis indicating a gap on HCT on this population groups. Tested for illness/symptom and opportunistic illness at diagnosis were also independent predictors for late HIV diagnosis; while having lifetime sexual partner 6 and above ($\geq$ 6) is associated with early presentation for diagnosis.

Based on these findings the following recommendation can be forwarded:

1. Governmental and non governmental organizations working on prevention and control of HIV and AIDS should target prevention efforts and HIV testing programs, in males as well as older age groups.
2. Promoting routine HIV testing as part of regular medical care may contribute to the reduction of late HIV testing.
3. Further large scale study should be done which includes patients who did not attend ART clinic and those visiting health facilities for other reasons with unknown HIV status.

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Annexes

Annex 1. Consent form (English)

Good morning/ good afternoon. My name is ___________________________. I am the staff of the hospital and working as a data collector in this research project. I am interviewing among people living with HIV who visit this ART clinic about factors associated with late HIV diagnosis. The information you are going to provide will help the investigator to identify those factors of late HIV diagnosis which will then help different action takers to promote early diagnosis and timely presentation of those with the virus for care. You are selected by chance and I am going to ask you some questions which are not difficult to answer. The questions are related to your socio-demographic, knowledge, attitude and belief about HIVAIDS, perceived stigma, medical history, issues related to healthcare facilities and HIV testing experiences before your diagnosis.

Your name will not be written in this form and will never be used in connection with any information you tell me. All information you will give will be kept strictly confidential. Your participation is voluntary and you are not obligated to answer any question which you do not wish to answer. The interview will take about 20 minutes and if you fill discomfort, please be free to skip questions or withdraw from participation at any time you want. If you have any unclear question, you can ask me. If you have no question and if it is clear, could I obtain your permission to continue?

1. Yes, (say thanks & obtain her/his signature to continue)

   Signature: _____________ date: ____ /_____/_____

2. No, (say “thanks and you can go”)

Annex 2. Questionnaire (English)

Instruction 1: Before the interview, ask the client if his/her first HIV positive diagnosis is after September, 2012 (2005 E.C) and then get his/her chart. After permission is obtained, fill the following information from the chart.

Hospital ___________________________

Year (E.C) of first HIV positive diagnosis___________________

CD4 cell count of first HIV diagnosis (cell/μl) ________________ (case / control)

WHO clinical stage of first HIV diagnosis __________________

Instruction 2: During interview, remember that all the questions you are going to ask are about conditions of the participant before his/her first diagnosis and circle the number that contains his/her choice of response.

1. Socio-demographic characteristics

Code no.	Questions	Response	Skip
101	Sex	1. Male 2. Female	
102	Age at first diagnosis (from chart)	-----------------years	
103	Place of residence	1. Urban 2. Rural	
104	Religion	1. Orthodox 3. Protestant 2. Muslim 4. Catholic 5. Other/specify --------------	
105	Ethnicity	1. Sidama 3. Kambata 2. Wolayta 4. Amara 5. Oromo 6. Gurage 7. Other/specify -----------	
106	Marital status	1. Never married 3. Divorced/separated 2. Married 4. Widowed	
107	With whom you were living with? (Living arrangement)	1. Family 3. Husband/wife 2. Alone 4. Others/specify-----	
108	Educational status	1. Can't read/write 3. Primary (1-8) 2. Read/write 4. Secondary (9-12) 5. Tertiary (TVET/college/university)	
109	Occupation	1. Unemployed 5. Daily laborer 2. Government employed 6. Driver 3. Farmer 7. Student 4. Merchant 8. Commercial sex worker 9. Others/specify_________	

110	Monthly income	1. ___________________	
111	Ownership of living house	2. Owning 2. Renting	

2. **Knowledge about HIV/AIDS**

Code no.	Questions	Response	Remark
201	Had you ever heard about HIV/AIDS?	1. Yes 2. No	If no, stop here
202	Did you know HIV can be prevented by using condom?	1. Yes 2. No	
203	Did you know HIV can be prevented by limiting sexual partners to 1 which is uninfected and faithful?	1. Yes 2. No	
204	Did you know a healthy looking person can have HIV?	1. Yes 2. No	
205	Did you know HIV cannot be transmitted by supernatural means?	1. Yes 2. No	
206	Did you know HIV cannot be transmitted by mosquitoes that have bitten someone with HIV?	1. Yes 2. No	

3. **Attitude towards HIV/AIDS**

Code no.	Questions	Response
301	Do you think that you were willing to care for a family member in your home with HIV/AIDS?	1. Yes 2. No
302	Would you buy fresh vegetables from HIV positive shopkeeper?	1. Yes 2. No
303	Did you think a female teacher who was HIV positive but not sick should be allowed to continue teaching?	1. Yes 2. No
304	Would you want not to keep secret if your family member got infected with HIV?	1. Yes 2. No

4. **Belief about HIV/AIDS**

Code no.	Questions	Response
401	Did you believe AIDS is a curable disease?	1. Yes 2. No
402	Did you believe that HIV/AIDS is a punishment for our immoral behavior?	1. Yes 2. No
403	Did you believe that having HIV is the end of one's life	1. Yes 2. No
404	Did you believe that a person with HIV can not get married and have children?	1. Yes 2. No
405	Did you believe that a person with HIV can not equally achieve a job as compared with a person without HIV?	1. Yes 2. No

5. **HIV Risk Perception (a) and Risky Behaviors (b)**

Code no.	Questions	Response categories	Skip
501a	What was your feeling about the chance that you already have HIV?	1. Would not happen 2. Could happen 3. Had no feeling	
502a	What was your main reason for wanting to test?	1. Screening (marriage, travel) 2. Symptoms (getting sick) 3. Risk exposure (Death/illness of partner, sharp materials) 4. Other/specify--------------	
503a	What do you think the mode of your HIV acquisition?	1. Heterosexual contact 2. Sharing sharp materials 3. Intravenous drug use 4. Blood transfusion 5. Others/specify--------	
501b	How many life time sexual partners did you have?	______________________	If no partner go to 506b
502b	What was the type of relationship with your latest partner?	1. Spouse 3. Casual/one time 2. Boy/girl friend	
503b	What was the HIV status of your latest partner?	1. Negative 2. Positive 3. Didn't know	
504b	Had you ever discussed risk of HIV infection with your latest partner?	1. Yes 2. No	
	How often did you use condom with your	1. always	

	latest partner?	2.sometimes 3. never	
505b	Had you ever paid/being paid for sexual intercourse?	1. Yes 2. No	
506b	Had you ever used drugs	1. Yes 2. No	
507b	How was your alcohol consumption history?	1. Never 2. Sometimes 3. Always	
508b	How often did you smoke cigarette?	1. Never 2. Sometimes 3. Always	
509b	How often did you chew khat?	1. Never 2. Sometimes 3. Always	

6. **Perceived HIV Stigma**

If you yourself and other people know you had HIV, what could happen? (Read every question for the participant to get his/her response)

Code no.	Questions	Response
601	I would feel guilty.	1. Yes 2. No
602	My friends would not want to continue their friendship with me.	1. Yes 2. No
603	My families would neglect me	1. Yes 2. No
604	My partner would break our marriage/relationship	1. Yes 2. No
605	People would gossip about me	1. Yes 2. No
606	I would be verbally harassed by people	1. Yes 2. No
607	I would be physically abused by my family	1. Yes 2. No
608	I would be physically abused by my partner	1. Yes 2. No
609	People would exclude me from social gatherings or activities	1. Yes 2. No
610	People would consider me as cursed	1. Yes 2. No
611	people would not respect me as before	1. Yes 2. No
612	People would fear for casual transmission (such as sharing a meal) and refusal of contact with me	1. Yes 2. No
613	I would be fired from my work	1. Yes 2. No
614	I would not be treated as equal as people without HIV in healthcare facilities	1. Yes 2. No

7. **Medical history**

Code No.	Questions	Response
701	Had you ever received treatment in a medical clinic?	1. Yes 2. No
702	Had you ever received treatment in a drugstore/pharmacy?	1. Yes 2. No
703	Have you ever been treated by traditional healer?	2. Yes 2. No
704	Have you ever been admitted to a hospital?	3. Yes 2. No
705	Was there any Opportunistic Illness? (from chart)	4. Yes 2. No
706	Had you ever been infected with sexually transmitted disease?	1. Yes 2. No

8. **Factors related to Healthcare service facilities and HIV testing**

Code no.	Questions	Response	Skip
801	What was the time taken of the nearest healthcare facility from your home?	--------- minutes	
802	Do you Know the presence of HIV testing service in the health facility?	1. Yes 2. No	
803	Did you know HIV testing service is free of charge in public health facilities?	1. Yes 2. No	
804	Did you have trust on the confidentiality of HIV testing service given in the health facility?	1. Yes 2. No	
805	Had you been tested for HIV before?	1. Yes 2. No	

Annex 4: የስምምነት ዉል ቅጽ

ሰላም እደምን አሉ? ስሜ --- እባላለሁ፡፡ የሆስፒታሉ ሰራተኛ ስሆን በዚህ ለሚደረገው ጥናት መረጃ እየሰበሰብሁ ነው፡፡ የጥናቱ አላማም ይህን የጸረ-ኤችአይቪ ክሊኒክ የሚጎበኙ ከቫይረሱ ጋር የሚኖሩ ሰወች ዘግይቶ የኤችአይቪ ምርመራ ማድረግ ምክንያቶችን መለየት ነው፡፡ እርስዎ የሚሰጡኝ ትክክለኛ መረጃ ተመራማሪው ዘግይቶ የመመርመርን ምክንያቶች በትክክል ለመለየት ይረዳዋል፡፡ በመቀጠልም የተለያዩ እርምጃ የሚወስዱ አካላት ቫይረሱ ያለባቸው ሰወች ቶሎ መመርመርን ለማሻሻልና በጊዜ የህክምናና እንክብካቤ አገልግሎት እዲያገኙ የሚያደረርጉትን ጥረት ያግዛል፡፡ እርስዎ የተመረጡት በእድል ሲሆን የተወሰኑ ለመመለስ የማይከብዱ ጥያቄዎችን እጠይቅዎታለሁ፡፡ ጥያቄዎችም ለመጀመሪያ ጊዜ ቫይረሱ እንዳለብወት ከማወቅዎ በፊት የነበረዎትን የኤችአይቪ/ኤድስ እና ጸረ-ኤችአይቪ ህክምና እውቀት፣ አመለካከትና እምነት፣ የመገለል ግምትዎን፣ የህክምና ታሪክዎን፣ ከጤና አጠባበቅ ተቋም ጋር ተዛማጅ ጉዳዮችንና የኤችአይቪ ምርመራ ተሞክሮዎትን ይሆናል፡፡

ስምዎት በቅጹ ላይ የማይጻፍና ከሚሰጡኝ ምንም አይነት መረጃ ጋር አይያያዝም፡፡ የሚሰጡኝ መረጃ በጥብቅ ሚስጥር ይቀመጣል፡፡ በጥናቱ የሚሳተፉት በፈቃድዎ ሲሆን መመለስ የማይፈልጉትን ማንኛውም ጥያቄ አንዲመልሱ አይገደዱም፡፡ ቃለ-መጠይቁ 20 ደቂቃወች ያህል የሚወስድ ሲሆን በማንኛውም ጊዜ አለመመቸት ከተሰማወት የማይፈልጉትን ጥያቄ ለማለፍና ተሳትፎዎትን በፈለጉ ጊዜ ለማቋረጥ እባክወትን ነጻነት ይሰማዎት፡፡

ግልጽ ያልሆነ ማንኛውም ጥያቄ ካለወት በማንኛውም ጊዜ መጠየቅ ይችላሉ፡፡ ጥያቄ ከሌለዎትና ግልጽ ከሆነ እባክዎትን ፈቃደኝነትዎትን ማግኘት እችላለሁ?

1. ይቻላል፡፡ (አመሰግናለሁ በል/ይ እና ፊርማቸውን ተቀበል/ይ)
   ፊርማ________________ቀን____/____/____

2. አይቻልም፡፡ ("አመሰግናለሁ መሄድ ይችላሉ" በል/ይ)

Annex 5: መጠይቅ፡

መመሪያ 1: ከቃለ-መጠይቁ በፊት ታካሚው/ዋ መጀመሪያ ኤችአይቪ አለብወት የተባሉት መስከረም 2005 ዓ.ም እና ከዚያ ወዲህ መሆኑን ያረጋግጡ:: ለመሳተፍ ፈቃደኝነታቸው ከተገኝ በኋላ የታካሚውን የህክምና መዝገብ ይፈልጉና የሚከተሉትን መረጃወች ከመዝገቡ ይሙሉ::

መጀመሪያ ኤችአይቪ አለብወት የተባሉበት ዓ.ም-------------------

መጀመሪያ ኤችአይቪ አለብወት በተባሉ ወቅት የነበረው CD4 ቁጥር ---------------

በአለም የጤና ድርጅት የበሽታው ደረጃ -------------------------------

መመሪያ 2: በቃለ-መጠይቁ ወቅት ከህክምና መዝገብ ላይ ከሚሞሏቸው ጥያቄዎች ወይም "ከመዝገብ" ከሚሉት በስተቀር ሌሎች ሁሉም ተሳታፊውን የሚጠይቋቸው ጥያቄች ተሳታፊው ኤችአይቪ እንዳለበት ከማወቁ በፊት ስለነበረው ሁኔታ መሆናቸውን ያሰታውሱ:: ከዚያም የተሳታፊውን መልስ የያዘውን ቁጥር ያክብቡ::

1. **የተሳታፊው ግለሰባዊና ማህበራዊ መረጃወች**			
ኮድ ቁጥር	**ጥያቄ**	**መልስ**	**እለፍ**
101	ጾታ	1. ወንድ 2. ሴት	
102	በምርመራ ወቅት እድሜ (ከካርድ ይሞላ)	-----------------(በአመት)	
103	የመኖሪያ ቦታ	1. ከተማ 2. ገጠር	
104	ሀይማኖት	1. ኦርቶዶክስ 3. ፕሮቴስታንት 2. ሙስሊም 4. ካቶሊክ 5. ሌላ/ይገለጽ-----	
105	ብሔር	1. ሲዳማ 4. አማራ 2. ዎላይታ 5. ኦሮሞ 3. ከምባታ 6. ጉራጌ 7. ሌላ/ይገለጽ-------	
106	የጋብቻ ሁኔታ	1. ያላገባ/ች 3. የተፋታ/ች 2. ያገባ/ች 4. በሞት የተለያየ	
107	ከማን ጋር ይኖሩ ነበር?	1. ከቤተሰብ ጋር 3. ከባለቤቴ ጋር 2. ብቻዬን 4. ሌላ ካለ ይገለጽ---------	
108	የትምህርት ደረጃ	1. ማንበብ መፃፍ የማይችል/ትችል	

		2. ማንበብ መፃፍ የሚችል/የምትችል 3. የመጀመሪያ ደረጃ ትምህርት(1-8) 4. የሁለተኛ ደረጃ ትምህርት(9-12) 5. ሶስተኛ ደረጃ(ሙያናቴክኒክ/ኮሌጅ/ዩኒቨርሲቲ)	
109	ስራ	1. ስራ የሌለው 6. ተማሪ 2. የመንግስት ሰራተኛ 7. አሽከርካሪ 3. ግብርና 8. ሴተኛ አዳሪ 4. ነጋዴ 9. ሌላ ካለ ይገለጽ------- 5. የቀን ሰራተኛ	
110	ወራዊ ገቢ	1. ----------------------	
111	የመኖሪያ ቤት ባለቤትነት	1. የራስ/ የግል/ የቤተሰብ 2. የኪራይ	

2. ተሳታፊው ስለ ኤችአይቪ የነበራቸው እውቀት			
ኮድ ቁጥር	**ጥያቄ**	**መልስ**	**እለፍ**
201	ስለኤች አይቪ ሰምተው ያወቁ ነበር?	1. አዎ 2. አላውቅም	አላውቅም ከሆነ ከዚህ ያቁሙ
202	ኤችአይቪን ኮንዶም በመጠቀም መከላከል እንደሚቻል ያውቁ ነበር?	1. አዎ 2. አላውቅም	
203	ኤችአይቪን አንድ ነጻና ታማኝ የግብረ ስጋ ጓደኛ በመያዝ መከላከል እንደሚቻል ያውቁ ነበር?	1. አዎ 2. አላውቅም	
204	ሲያዩት ጤነኛ የሚመስል ሰው ኤችአይቪ ሊኖረው እንደሚችል ያውቁ ነበር?	1. አዎ 2. አላውቅም	
205	ኤችአይቪ ከሰብዓዊ ባህሪ ውጭ በሆኑ መንገዶች እንደማይተላለፍ ያውቁ ነበር?	1. አዎ 2. አላውቅም	
206	ቫይረሱ ያለበትን ሰው በነደፈች የወባ ትንኝ ኤችአይቪ እንደማይተላለፍ ያውቁ ነበር?	1. አዎ 2. አላውቅም	

3. ስለኤቻይቪ የነበረዎትን አመለካከት በተመለከተ		
ኮድ ቁጥር	**ጥያቄ**	**መልስ**
301	ኤቻይቪ ኤድስ ያለበት የቤተሰብዎን አባል ለመንከባከብ ፈቃደኛ ነበርኩ ብለው ያስባሉ?	1. አዎ 2. አላስብም
302	ኤችአይቪ ካለበት ባለሱቅ አትክልት ልገዙ ይችሉ ነበር?	1. አዎ 2. አልችልም
303	ኤችአይቪ የነበረባት ግን ያልታመመች ሴት አስተማሪ ማስተማሯን መቀጠል አለባት ብለው ያስቡ ነበር?	1. አዎ 2. አላስብም
304	በቫይረሱ የተጠቃ የቤተሰብዎ አባል ቢኖር ሚስጥር እንዳይሆን ይፈልጉ ነበር?	1. አዎ 2. አልፈልግም

4. ስለ ኤችአይቪ የነበረዎትን እምነት በተመለከተ		
ኮድ ቁጥር	**ጥያቄ**	**መልስ**
401	ኢድስ የሚድን በሽታ ነው ብለው ያምኑ ነበር?	1.አዎ 2. አላምንም
402	ኤችአይቪ ኢድስ ከግብረ ገብነት ውጭ ለሆነ ምግባራችን ቅጣት ነው ብለው ያምኑ ነበር?	1.አዎ 2. አላምንም
403	በኤችአይቪ መያዝ የህይወት መጨረሽ ነው ብለው ያምኑ ነበር?	1.አዎ 2. አላምንም
404	ኤችአይቪ ያለበት ሰው ማግባት እንደማይችልና ልጆች እንደማይወልድ ያምኑ ነበር?	1.አዎ 2. አላምንም
405	ኤችአይቪ ያለበት ሰው ከሌለበት ሰሙ ጋር በስራ ቢወዳደር በእኩል መጨረስ አይችልም ብለው ያምኑ ነበር?	1.አዎ 2. አላምንም

5. ለኤችአይቪ ተጋላጭነትን መለየትና አጋላጭ ፀባዮች		
ኮድ ቁጥር	**ጥያቄ**	**መልስ**
501	በኤችአይቪ ተይዤ ይሆናል ብለው አስበው ነበር?	1. አዎ 2. አልነበረም
502	ለመመርመር የመፈለግዎ ዋና ምክንያት ምንድን ነበር?	1. ለማጣራት (ለቅድመ ጋብቻ ዝግጅት፣ ውጭ ሀገር ለመሄድ) 2. ምልክቶች በማየት (በመታመሜ ሀኪም እንድመረመር አዝዞኝ) 3. ለበሽታው በመጋለጤ (የፍቅር

		ጎደኛየ/ባለቤቴ መታመም/መሞት ለስለታማ ነገሮች በመጋለጤ) 4. ሌለ ካለ ይገለጽ-----------------
503	ኤቻይቪ የያዘብዎት መንገድ ምንድን ነው ብለው ያስባሉ?	1. የተቀራኒ ጾታ ግብረ ስጋ ግንኙነት 2. ስለታማ ነገሮችን መጋራት 3. በመርፌ መዳኒት መውሰድ 4. በደም ልገሳ 5. ሌላ ካለ ይገለጽ -----------------
504	በህይወት ዘመንዎ ስንት የግብረስጋ ግንኙነት ጓደኛ ነበሩዎት?	---------------------, የለም ከሆነ ወደ 510 ይለፉ
505	ከመጨረሻ ጓደኛዎት ጋር የነበረዎት ግንኙነት ምን አይነት ነበር?	1. ባለቤቴ 3. ጊዜአዊ/የአንድ ጊዜ 2. የፍቅር ገደኛ 4. ሌላ ካለ ይገለጽ--------
506	የመጨረሻ ጓደኛዎ የኤችይቪ ሁኔታ ምንድን ነበር?	1. አልነበረበትም 2. ነበረበት 3. አላወኩም
507	ከመጨረሻ ጓደኛዎት ጋር ስለኤቻይቪ ተጋላጭነት ተወያይተው ያውቁ ነበር?	1. አዎ 2. አላውቅም
508	ከመጨረሻ ጓደኛዎ ጋር ኮንዶም በምን ያህል ጌዜ ይጠቀሙ ነበር?	1. ሁሌ 2. አንዳንዴ 3. ተጠቅመን አናውቅም
509	ለግብረ ስጋ ግንኙነት ከፍለው/ተከፍልዎት ያውቃሉ?	1. አዎ 2. አላውቅም
510	አደንዛዥ ዕፅ ተጠቅመው ያውቃሉ?	1. አዎ 2. አላውቅም
511	አልኮል የመጠቀም ታሪክዎ እንዴት ነበር?	1. ጠጥቼ አላውቅም 2. አንዳንዴ 3. ሁሌ
512	ጫት በምን ያህል ጊዜ ይቅሙ ነበር?	1. ቅሜ አላዉቅም 2. አንዳንዴ 3. ሁሌ
513	ሲጋራ በምን ያህል ጊዜ ያጨሱ ነበር?	1. አጭሼ አላዉቅም 2. አንዳንዴ 3. ሁሌ

6. **ኤቻይቪ በመያዘዎ ምክንያት የሚገምቱት መገለል** እርስዎ እራስዎ እና ሌሎች ኤቻይቪ እንዳለብዎት ቢያውቁ ምን ይፈጥራል		
ኮድ ቁጥር	**ጥያቄ**	**መልስ**
601	ጥፍተኛ እነደሆንኩ ይሰማኛል	1. አዎ 2. አይሰማኝም
602	ጓደኞቼ ከእኔ ጋር ጓደኝነታቸውን ላይቀጥሉ ይችላሉ?	1. አዎ 2. አያቋርጡም
603	ቤተሰቦቼ ችላ ሊሉኝ ይችላሉ	1. አዎ 2. አይሉኝም
604	ሰዎች ስለ እኔ አሉባልታ ያወራሉ	1. አዎ 2. አያወሩም
605	የትዳር/የፍቅር ጓደኛዬ ትዳራችንን/ግንኙነታችንን ሊያቋርጥ/ልታቋርጥ ይችላል/ትችላለች	1. አዎ 2. አያቋርጥም/አታቋርጥም
606	ሰዎች በቃል ይዘልፉኛል	1. አዎ 2. አይዘልፉኝም
607	ቤተሰቦቼ አካላዊ ጥቃት ሊያደርሱብኝ ይችላሉ	1. አዎ 2. አያደርሱብኝም
608	የትዳር አጋሬ/የፍቅር ጓደኛዬ አካላዊ ጥቃት ሊያደርስብኝ ይችላል	1. አዎ 2. አያደርስብኝም
609	ሰዎች በማህበራዊ ስብሰባዎች ወይም እንቅስቃሴዎች ያገሉኛል	1. አዎ 2. አያገሉኝም
610	ሰዎች እንደተረገምኩ ሊቆጥሩኝ ይችላል	1. አዎ 2. አይቆጥሩኝም
611	ሰዎች እንደድሮው አያከብሩኝም	1. አዎ 2. ያከብሩኛል
612	ሰዎች በድንገት እንዳላስተላልፍባቸው ይፈራሉ፣ምግብ አብሮ በመብላት ከእኔ ጋር መነካካትን አይፈልጉም	1. አዎ 2. አይፈሩኝም
613	ከስራዬ ልባረር እችላለሁ	1. አዎ 2. አልባረርም
614	በጤና ተቋማት ኤችአይቪ ከሌለባቸው ሰዎች እኩል ላልታከም እችላለሁ	1. አዎ 2. እታከማለሁ

7. **የህክምና ታሪክ**		
ኮድ ቁጥር	**ጥያቄ**	**መልስ**
701	በህክምና ክሊኒክ ታክመው ያውቁ ነበር	1. አዎ 2. አላውቅም
702	ከመድሀኒት ቤት መድሀኒት ወስደው ያውቁ ነበር	1. አዎ 2. አላውቅም
703	በባህል ሀኪም ታክመው ያውቁ ነበር	1. አዎ 2. አላውቅም
704	ሆስፒታል ተኝተው ታክመው ያውቁ ነበር	1. አዎ 2. አላውቅም

705	ተጓዳኝ በሽታ ነበርብዎት (ከመዝገቡ ይሞላ)	1. አዎ 2. አልነበረም
706	በአባላዘር በሽታ ተይዘው ያውቁ ነበር	1. አዎ 2. አላውቅም

8. ከጤና እንክብካቤ አገልግሎት ሰጭ ተቋም እና ከኤችአይቪ ምረመራ ጋር የተያያዙ ምክንያቶች			
ኮድ ቁጥር	**ጥያቄ**	**መልስ**	**እለፍ**
801	በቅርብ የሚገኘው የጤና እንክብካቤ አገልግሎት ሰጭ ተቋም ከመኖሪያ ቤትዎ ያለው የሚፈጀው ጊዜ ምን ያህል ነበር?	-------ሰዓት	
802	በጤና ተቋማት የኤችአይቪ ምርመራ አገልግሎት እንዳለ ያቁ ነበር?	1. አዎ 2. አልነበረም	
803	የኤችአይቪ ምርመራ አገልግሎት በመንግስት ጤና ተቋማት ከክፍያ ነጻ እንደሆነ ያውቁ ነበር?	1. አዎ 2. አላውቅም	
804	በጤና ተቋሙ በሚሰጠው የኤችአይቪ ምርመራ አገልግሎት እምነት ነበረዎት?	1. አዎ 2. አልነበረኝም	
805	የኤችአይቪ ምርመራ አድርገው ያውቁ ነበር?	1. አዎ 2. አላውቅም	

ስለ ጊዜዎት ከልብ አመሰግናለሁ!

Declaration

I, the under signed, declare that this thesis is my original work, has not been presented for a degree in any other university and that all resources of material used for this thesis have been fully acknowledged.

Name: Akalewold Alemayehu

Signature_____________

Date ________________

Place: Addis Ababa University

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

Dr. Alemayehu Worku Signature ___________ Date ____________