

# HIV incidence, knowledge, attitude and practices of HIV/AIDS and antiretroviral therapy use in HIV-infected patients at Debre Elias district, North West Ethiopia

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## Abstract

Due to hotspots as development schemes that attract mobile groups, HIV/AIDS infections are the biggest health issue in communities with low awareness and safe practice, especially in smaller towns. This study examined HIV/AIDS and Antiretroviral Therapy (ART) use-related knowledge, attitude, and practice in AIDS patients. Debre Elias Health Center conducted a cross-sectional study (N=384) from June 10 to January 20, 2021. Participants were selected using systematic random sampling and interviewed using a structured questionnaire. Logistic regression

calculated significance and association between dependent and independent variables. 236 (384) or 61.4% of 384 HIV patients on antiretroviral therapy were female. HIV rates increased from 2014 to 2019. Age difference was associated with patient knowledge of ART use ( $p=0.005$ ). Patients' attitudes towards HIV/AIDS and ART use were significantly correlated with age, residence, marital status, and education ( $p<0.001$ ). HIV patients 25-30 were 2.2 times more likely to know about ART use. HIV patients with a degree or higher were five times more likely to support ART. HIV patients aged 14-24 with a positive ART outlook were 94% protective. HIV prevalence is rising, especially among 15 to 24-year-old women. Public protection is needed to reduce HIV transmission.

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## Introduction

Human immunodeficiency virus (HIV) infection and acquired immunodeficiency syndrome (AIDS) have emerged as a formidable global public health crisis claiming 36.3 million lives as of year 2021.<sup>1</sup> The HIV/AIDS epidemic has brought about overwhelming threats to economically poor countries, about 95% are found in developing world, of which high infections were in Sub Saharan Africa.<sup>1</sup> Young people were the most affected. An estimated 10 million HIV/AIDS infections occur in young people aged 15-24 years and more than 6000 new cases of the virus every day. In general, above 50% of all new HIV incidences occur between 15 and 24 year-olds.<sup>2</sup>

HIV and AIDS have become a major health problem and the main cause of morbidity and mortality in all parts of the globe. For instance, people living with HIV, new HIV infections, and AIDS-related deaths were 37.9, 1.8, and 1 million respectively, in the world in 2018.<sup>1</sup>

Similarly, new HIV infections were highest among women, constituting more than half of all people living with HIV and AIDS-related illnesses. Young women (aged 15-24 years), and adolescent girls (aged 10-19 years) in particular, account for more than one-third of all people living with HIV/AIDS (PLWHA) which is a disproportionate number of new HIV infections.<sup>1,3</sup> Still, the disease continues to spread with no cure yet in sight. There is a need to fight the pandemic through evidence-based approaches that focus on reducing deficiency in knowledge, attitude, and response against the infection.<sup>4</sup>

Globally, most of the new HIV infections occur through sexual contact, and transmission occurs more commonly from persons unaware they have HIV.<sup>4</sup> The growth rates of HIV and other sexually transmitted infections are higher in Africa. Out of 37.9 million HIV infections in the world, 25.7 million were in Africa. It accounts for almost two-thirds of the total new HIV incidence.<sup>1</sup>

About 70% of the total HIV-infected people in Africa were from sub-Saharan Africa (SSA). In this region, most of the new

HIV infection occurs among people aged 15-24 years old.<sup>1</sup> Nearly 80% of the population in SSA is not aware of their infection. More than 90% do not know if their sexual partners are infected. Such situations invite the further spread of the epidemic.<sup>5</sup>

Discrimination against positive people can help the AIDS epidemic to spread - if people are fearful of being tested for HIV, and then they are more likely to pass the infection to someone else without knowing.<sup>6</sup> Experience in community counseling shows local communities can make healthy choices about preventing HIV and caring for those with AIDS.<sup>7</sup> When communities act for care and change, self-measure for progress, and transfer to other communities, we know they are competent and confident in their own future.<sup>8</sup>

HIV testing is the main gate for individualized HIV care and treatment, and undiagnosed HIV infections undermine the effectiveness of HIV programs. Early initiation of Antiretroviral Therapy (ART) reduces HIV transmission and is an essential component of comprehensive prevention strategies. Effective Antiretroviral (ARV) drugs can control the virus and help to prevent transmission so that people with HIV, and those at substantial risk, can enjoy healthy, long, and productive lives.<sup>4</sup> Since the introduction of the ART program in Cuba in 2001, deaths from AIDS have dramatically decreased.<sup>9</sup>

One of the basic reasons to analyze HIV/AIDS knowledge is to examine its direct linkage to improve the chances of self-protection (e.g., enhanced knowledge allows for consistent and proper use of condoms).<sup>10,11</sup> Recently due to the non-achievement of millennium goals on HIV/AIDS in different countries in the world especially in developing countries, the joint United Nations program on HIV/AIDS has fixed new objectives to overcome HIV infections by 2030.<sup>12</sup>

However, the HIV/AIDS epidemic is still the most serious challenge in Ethiopia, where the adult population between the ages of 15-49, which comprises the vast majority of the workforce, is the worst affected. Youth age ranges from 13-30 years are the most sexually active ages that are mainly exposed to HIV because of the strong influence of peer pressure and the development of their sexual and social identities which often lead to conducting sexual practice. As they are initiating sexual behavior, counseling for safe practice is vital.<sup>13,14</sup>

Hence the measures to raise awareness and combat HIV/AIDS are vital to increase awareness among communities about HIV/AIDS, in order to bring about a change in people's attitude and behavior which stimulates a sympathetic response towards people who are vulnerable to or affected by HIV.<sup>15</sup> This study described the prevalence and incidence of HIV and ART use-related knowledge, attitude, and good practices among people with HIV living in Debre Elias district, North West Ethiopia.

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## Materials and Methods

### Study area and study population

Debre Elias town is an administrative town in Debre Elias woreda (district). It is one of the 105<sup>th</sup> districts in Amhara Region and the 18<sup>th</sup> district from East Gojjam Zone which is located between 9°50'00"N-10°30'00"N and 37°10'00"E-37°30'00"E latitude and longitude respectively (generated from Ethio GIS data CSA, 2007). Debre Elias town is approximately 342 kilometers distant from the capital city of Ethiopia (Addis Ababa). The study subjects were HIV-positive people of ART users in Debre Elias

district. The district has a total population of about 100,797. From these, 50,842 are females and the remaining 49,955 are males. Debre Elias town has one health center, two private clinics, and one private drug store. It also has one Technical Vocational Education and Training college, one preparatory school, one secondary school, and two governmental primary schools (Debre Elias district communication office).

### Study design

The study used a health center-based cross-sectional study among people living with HIV (2014-2019) who had been on ART use for at least three months in Debre Elias Health Center.

The inclusion criteria were: all newly infected HIV-positive patients who registered in Debre Elias Health Center from 2014-2019 that use ART.

The exclusion criteria were: patients whose clinical records were not complete or missing, transferred out, or died.

### Sample size determination and sampling technique

A sample size was determined using Daniel's formula  $n = Z^2 P(1-P)/d^2$ .<sup>16</sup>  $P=50\%$ , since there was no previous study conducted around the Debre Elias district, where  $d$  was a 5% margin of error at a 95% confidence interval and  $Z$  was standard score corresponds to 1.96 with a none response rate of 5%. This would give a sample size of 403. To select the sample population, a systematic random sampling technique was used.

### Data collection

Retrospective data, 2014-2019 were collected from document analysis. Primary data was collected by using questionnaires and interviews. Two data collectors participated in this task and the principal investigator checked the completeness of the data.

### Data management and analysis

Following data collection, it was looked at for completeness and consistency, coded, and entered into Statistical Package for the Social Sciences version 20 program for analysis. Univariate and multivariate logistic regression was employed to measure associations of socio-demographic variables on knowledge, attitude, and practice (KAP) towards HIV/AIDS and ART use. Values were considered significant when  $P < 0.05$ .

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## Results

### Socio-demographic and clinical features of the study participants

During the study period, a total of 384 HIV/AIDS patients at Debre Elias Health Center, and 95.3% of the initial sample were successfully followed up. Among these, 236 (61.5%) were females and 148 (38.5%) were males (Table 1). HIV infection was most common in those aged 15 to 24, 124 (32.3%), followed by age 25 to 34, 98 (25.5%). The majority of 206 (53.7%) PLWHA were from rural areas. 71% had attained grades 1-12, and nearly 29% held certificates, diplomas, degrees, and above.

230 (60%) had good ART adherence. Of the study subjects, 175 (45.5%) were determined to be at WHO clinical stage III. About 169 (44.1%) of the participants had a CD4 count of 200-500 cells/mm<sup>3</sup>, 128 (33%) had a level of 500 or more, and 88 (22.9%) had a CD4 count of fewer than 200 cells/mm<sup>3</sup>.

### HIV/AIDS incidence and antiretroviral therapy use at Debre Elias district, 2014-2019

As shown in Table 1, the retrospective data from 2014 to 2019 showed 585 individuals were found to be newly infected HIV-positive individuals and ART users. The incidence of HIV gradually increased from 2014 to 2019 (Figure 1).

#### Distribution of HIV/AIDS incidence by age and sex

Out of the 585 HIV-positive individuals on ART, 226 (39%) were males and 359 (61%) were females, as seen in Figure 2. HIV/AIDS infections were higher in 15–24-year-olds (32.5%), followed by 25–34-year-olds (25.6%).

#### Knowledge, attitude and practice of respondents about HIV/AIDS and antiretroviral therapy use

##### Knowledge of patients towards HIV/AIDS and antiretroviral therapy use

Approximately 315 (82%) of HIV patients were aware of ART use and HIV/AIDS. 372 (96.9%) of the participants in total were

aware that AIDS is not a curable disease. Furthermore, 286 (74.5%) of the participants were aware that HIV transmission occurs through unsafe sex. Only 114 (29.7) of the patients were aware that HIV infection is not transmitted through sharing food, clothing, or restrooms. The majority of the participants, 337 (87.8%), correctly know that abstaining from sex is a very good preventive method for HIV/AIDS. Furthermore, 282 (73.4%) of participants also knew that proper condom use can protect against HIV/AIDS. 337 (87.8%) of patients did not believe that HIV-positive patients taking ART drugs cannot transmit HIV. Additionally, 299 (77.9%) and 317 (82.6%) of the respondents stated that ART does not consist of drugs to cure HIV/AIDS and missing ART doses can lead to disease progression respectively. Furthermore, 356 participants (92.7%) were aware that PLWHA require ART treatment for the duration of their lives (Table 2).

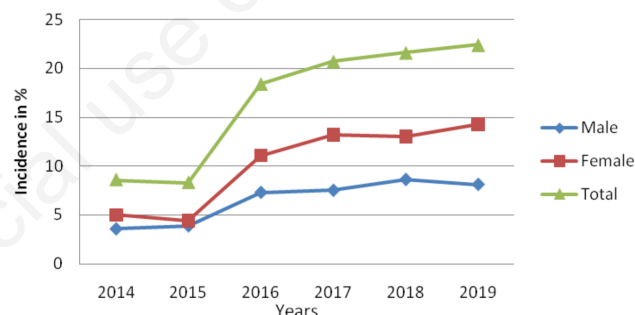
##### Attitude towards HIV/AIDS

Accordingly, 309 (80.5%) of the respondents had a positive attitude while 75 (19.5%) of participants were classified as having a negative outlook. The majority of participants, 304 (79.2%), had

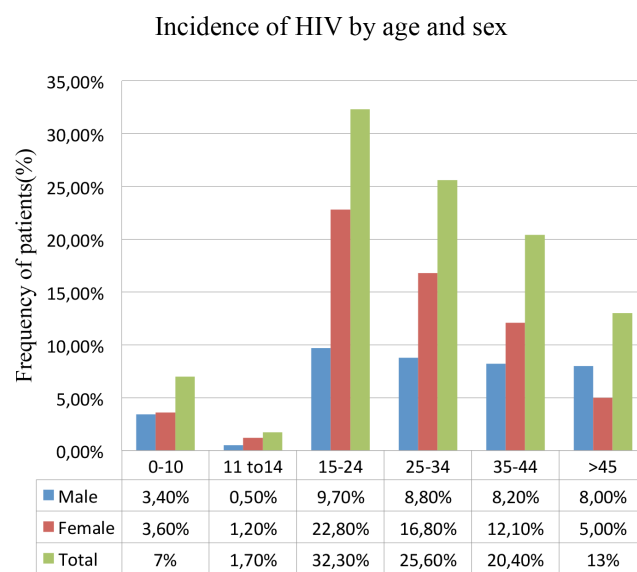
**Table 1.** Socio-demographic and clinical characteristics of people living with HIV/AIDS (n=384) at Debre-Elias district, Northwestern Ethiopia, 2014-2019.

Characteristics	Frequency	%
<b>Sex</b>		
Male	148	38.5
Female	236	61.5
<b>Age (years)</b>		
0-10	27	7
11-14	7	1.7
15-24	124	32.3
25-34	98	25.6
35-44	78	20.4
>45	50	13
<b>Marriage</b>		
Married	130	33.8
Single	254	66.2
<b>Residence</b>		
Urban	178	46.3
Rural	206	53.7
<b>Education</b>		
Grade 1-12	274	71.4
Certificate	18	4.7
Diploma	39	10.1
Degree and above	53	13.8
<b>ART adherence</b>		
Good	230	60
Fair	123	32
Poor	31	8
<b>WHO clinical stage</b>		
WHO stage I	74	19.3
WHO stage II	121	31.6
WHO stage III	175	45.5
WHO stage IV	14	3.6
<b>CD4 cell count</b>		
<200cell/mm <sup>3</sup>	88	22.9
200-500cell/mm <sup>3</sup>	169	44.1
Above 500cell/mm <sup>3</sup>	127	33

ART, antiretroviral therapy; WHO, World Health Organization. Source: adapted from the Health Center's Clinical Record Format.



**Figure 1.** HIV/AIDS incidence from 2014-2019 among people living with HIV/AIDS in Debre Elias district.



**Figure 2.** Distribution of HIV/AIDS incidence by sex and age group in Debre Elias district, 2014-2019.

**Table 2.** Knowledge of study participants on HIV/AIDS and antiretroviral therapy use in Debre Elias district, 2019.

Knowledge question items	Responses N (%)
1. Is it possible to cure from AIDS?	
Yes	12 (3.1)
No	372 (96.9)
2. Is it HIV transmission mainly occurs through doing unsafe sex?	
Yes	286 (74.5)
No	98 (25.5)
3. HIV can be transmitted through sharing of meals, clothes and latrines	
Yes	270 (69.3)
No	114 (29.7)
4. Abstain from sex is a very good preventive method of HIV/AIDS transmission	
Correct	337 (87.8)
Incorrect	47 (12.2)
5. Can proper condom use be protective to HIV/AIDS transmission?	
Yes	282 (73.4)
No	102 (26.6)
6. HIV positive patients taking on ART drugs cannot transmit HIV?	
Correct	30 (12.2)
Incorrect	354 (87.8)
7. Can low ART therapeutic doses lead to disease progression	
Yes	296 (77.9)
No	88 (22.9)
8. Is it ART drugs curable to HIV/AIDS?	
Yes	67 (17.4)
No	317 (82.6)
9. ART should be taken throughout the life span of the patient?	
Yes	356 (92.7)
No	28 (7.3)
10. Over all knowledge status	
Knowledgeable	315 (82)
Not knowledgeable	69 (18)

ART, antiretroviral therapy. Note: the percentage of the respective characteristic is calculated from the total examined.

**Table 3.** Attitudes of people living with HIV/AIDS towards HIV/AIDS and antiretroviral therapy use in Debre Elias District, Ethiopia.

Attitude item questions	Responses N (%)
1. Should a person having HIV do sexual intercourse only with condom?	
Yes, agree	304 (79.2)
No, disagree	80 (20.8)
2. A person with HIV/AIDS is hopeless?	
Agree	139 (36.2)
Disagree	245 (63.8)
3. The presence of many sexual partners increase the chance of getting the virus	
Agree	370 (96.4)
Disagree	14 (3.6)
4. It is shameful for HIV/AIDS patients to take ART drugs?	
Agree	108 (28.1)
Disagree	276 (71.9)
5. ART gives more benefits than harm?	
Agree	258 (67.2)
Disagree	126 (32.8)
6. ART drug does not cure HIV patients, So its treatment is a waste of time.	
Agree	100 (26)
Disagree	284 (74)
7. An HIV patient takes ART drugs only when he feels sickness?	
Agree	11 (2.9)
Disagree	373 (97.1)
8. Overall attitude status	
Positive	309 (80.5)
Negative	75 (19.5)

ART, antiretroviral therapy. Note: the calculated percentage for the respective characteristic is from the total examined.

a positive attitude toward using condoms during sexual intercourse. Moreover, the majority of participants, 370 (96.4%), responded that the presence of multiple sexual partners can increase the chance of getting an HIV infection.

In terms of their attitudes towards ART use, 276 (71.9%) thought that it was beneficial for HIV/AIDS patients to use ART medications, and 258 (67.2%) agreed that ART improves health. Furthermore, 284 (74%) of the participants thought that taking ART medications was a good idea rather than a waste of time (Table 3).

### Practices of people living with HIV/AIDS towards HIV/AIDS and antiretroviral therapy use

In the current study, 215 (56%) of the PLWHA had good practices, while 169 (44%) had poor practices. Of them, 155 (40.4%) had never used a condom during sexual activity. Many of them, 267 (69.5%), had engaged in unprotected sexual intercourse. The majority of the 210 individuals (54.7%) had a consistent sexual partner. In terms of their practice towards ART use, the majority of respondents, 273 (71%), began as soon as they knew they were HIV carriers or patients. Table 4 shows that 268 (69.8%) of the individuals showed good adherence to using ART.

### Socio-demographic variables vs. knowledge, attitudes, and practices

Males outnumbered females in knowledge, 102 (82.9%), and good practice, 101 (81.2%), while females had a better attitude, 217 (83.1%), than males. The age group >30 had a good attitude, 172 (91.2%), and practice, 160 (84.7%), while PLWHA found in the 25-30 age group had almost positive knowledge, 349 (91%), and a good attitude, 325 (84.7%). Comparing PLWHA with married counterparts, the married group showed a better attitude (90.1%) and greater knowledge (87.4%). Good behavior was observed in lone PLWHA. Additionally, individuals who resided in urban areas knew, 144 (83.7%), regarding HIV and the use of ART,

but they also practiced it poorly, 61(35.5%), whereas those who lived in rural areas had a positive attitude, 185 (86.7%), and good practices, 108 (50.9%). With respect to educational attainment, the majority of participants with promising knowledge had a degree or above (92.5%), while 36 respondents with strong practice had a diploma (92.3%). Furthermore, PLWHA with grades 1-12 had a better practice 144 (52.5%) compared to their respective counterparts (Table 5).

The use of KAP in multivariate analysis, the associations between various PLWHA characteristics, and ART use were examined (Table 6). Compared to female HIV-positive patients, male patients were shown to be 5.0 times more likely to practice excellent ART use. When compared to other individuals in their age group, PLWHA between the ages of 25 and 30 were shown to be 2.2 times more likely to have superior knowledge of ART use. When compared to people at lower grade levels, PLWHA with educational standing (degree and above) were found to be five times more likely to have a positive attitude toward using ART. In addition, PLWHA of urban residents were shown to have a 1.73-fold higher likelihood of having good experience in using ART than occupants of rural areas.

PLWHA in the 14-24 age range who were aware were shown to be 69% less likely to have poor ART adherence. PLWHA in the 14-24 age range who had a favorable prognosis for using ART were shown to be 65% less likely to have poor adherence to their treatment regimen. 94% of PLWHA in the 25-30 age group who had a positive attitude toward ART use were found to be protective. 84% of PLWHA in the 25-30 age group who practiced well were found to be protective. 50% of married PLWHA with strong comprehension and abilities were found to be protective. Married PLWHA with a positive prognosis were shown to be 65% less likely to experience poor ART adherence. Urban inhabitants of PLWHA with a good attitude were found to be protected by 65% from bad adherence to ART use. Study participants with educational status with a degree and above were found to be protected by

**Table 4.** Practices in people living with HIV/AIDS towards HIV/AIDS and antiretroviral therapy use, in Debre Elias district, Ethiopia, 2019.

Practice question items	Responses N (%)
1. Have you ever used condom?	
Yes	155 (40.4)
No	229 (59.6)
2. Have you practiced unprotected sex?	
Yes	267 (69.5)
No	117 (30.5)
3. Do you have Constant sexual partner	
Yes	210 (54.7)
No	174 (45.3)
4. Have you started ART As soon as you know with HIV?	
Yes	273 (71)
No	111 (29)
5. Have you dropped ART after starting use?	
Yes	55 (14.3)
No	329 (85.7)
6. Do you have good Adherence to ART?	
Yes	268 (69.8)
No	116 (30.2)
7. Overall practice	
Good	215 (56)
Poor	169 (44)

ART, antiretroviral therapy. Note: for the respective characteristics, the percentage is calculated from the total examined.

74% compared to other lower grade levels from bad adherence to ART use. PLWHA with educational status with diplomas having good practice were found to be protected by 69% from bad adherence of ART use (Table 6).

## Discussion

The incidence and prevalence of HIV/AIDS and ART use for the present study populations showed some differences as compared to earlier reports from different regions of Ethiopia. This

might be due to the differences in the knowledge of HIV/AIDS prevention and ART use in different localities such as rural and urban areas, and small and big towns of the communities. Other investigators also reported that the prevalence of HIV/AIDS incidence and ART use varies in different regions of Ethiopia.<sup>16,17</sup> These inconsistencies are due to comprehensive knowledge of HIV/AIDS that were subject to differences in time, place and conditions. On the other hand, knowledge of how the virus is spread will help people escape from the virus.

Trends of HIV/AIDS incidence and ART use gradually increased between the years 2014 to 2019; this might be due to the

**Table 5.** Effect of socio-demographic factors on knowledge, attitude and practices towards HIV infection and antiretroviral therapy use in Debre Elias district, Northwestern Ethiopia, 2019.

Variables, N (%)	Knowledge		Attitude		Practice	
	Knowledgeable	Not knowledgeable	Positive	Negative	Good	Poor
Sex						
Male	102 (82.9)	21 (17.1)	92 (74.8)	31 (25.2)	101 (82.1)	22 (17.9)
Female	213 (81.6)	48 (18.4)	217 (83.1)	44 (16.5)	114 (43.7)	147 (56.3)
Age						
14-24	97 (78.9)	26 (21.1)	79 (64.2)	44 (35.8)	56 (45.5)	67 (54.5)
25-30	172 (91)	17 (9)	160(84.7)	29 (15.3)	98 (51.9)	91 (48.1)
>30	46 (63.9)	26 (36.1)	70 (97.2)	2 (2.8)	61 (84.7)	11 (15.3)
Marital status						
Single	218 (79.9)	55 (20.1)	209 (76.6)	64 (23.4)	148 (54.2)	125 (45.8)
Married	97 (87.4)	14 (12.6)	100 (90.1)	11 (9.9)	67 (60.4)	44 (39.6)
Residence						
Urban	144 (83.7)	28 (16.3)	124 (72.1)	48 (27.9)	111(64.5)	61 (35.5)
Rural	171 (80.7)	41 (19.3)	185 (87.3)	27 (12.7)	104 (49.1)	108 (50.9)
Educational status						
Grade 1-12	218 (79.6)	56 (20.4)	219 (80)	55 (20)	130 (47.4)	144 (52.5)
Certificate	15 (83.3)	3 (16.7)	8 (44.4)	10 (55.6)	12 (66.7)	6 (33.3)
Diploma	33 (84.6)	6 (15.4)	36 (92.3)	3 (7.7)	32 (82.1)	7 (17.9)
Degree and above	49 (92.5)	4 (7.5)	46 (86.8)	7 (13.2)	41 (77.4)	12 (22.6)

Note: the calculated percentage for the respective characteristic is from the total examined.

**Table 6.** Association of knowledge, attitude, and practices of patients towards antiretroviral therapy use in Debre Elias district, Northwestern Ethiopia, 2019.

Variables, N (%)	Knowledge		Attitude		Practice	
	AOR (CI)	p-value	AOR (CI)	p-value	AOR (CI)	p-value
Sex						
Male	1.503 (0.815-2.773)	0.192	0.606 (0.336-1.090)	0.095	5.013 (2.868-8.763)	<0.001
Female	1		1		1	
Age						
14-24	0.317 (0.160-0.628)	0.001	0.352 (0.198-0.629)	<0.001	0.696 (0.418-1.160)	0.165
25-30	2.213 (1.120-4.372)	0.022	0.062 (0.014-0.274)	<0.001	0.164 (0.074-0.362)	<0.001
>30	1		1		1	
Marital status						
Married	0.503 (0.258-0.978)	0.043	0.350 (0.168-0.729)	0.005	0.811 (0.486-1.354)	0.423
Single	1		1		1	
Residence						
Urban	1.344 (0.757-2.386)	0.312	0.466 (0.263-0.826)	0.009	1.725 (1.072-2.775)	0.025
Rural	1		1		1	
Education						
Grade 1-12	1		1		1	
Certificate	0.556 (0.211-1.465)	0.235	0.351 (0.097-1.264)	0.109	0.228 (0.090 - 0.578)	0.002
Diploma	0.268 (0.090-0.805)	0.19	0.478 (0.192-1.187)	0.112	0.307 (0.146- 0.648)	0.002
Degree and above	0.262(0.08-0.6)	0.001	5.13 (1.698-15.514)	0.004	0.408(0.20-0.621)	0.001

AOR, adjusted odds ratio; CI, confidence interval. Note: the percentage for the respective characteristics is calculated from the total examined.

Debre Elias district having good agricultural land for sesame oil seed cultivation and there is an increment of new investments that attract high numbers of labor migrants who are young and sexually active from the surrounding districts to the town in search of job opportunities that might contribute to the increase of HIV transmission. A study on ART in Ethiopia depicted a substantial expansion of access to HIV counseling and testing in Ethiopia.<sup>18</sup> This increase is attributed to the integration work of health extension workers, non-governmental organizations, and other stakeholders who play a crucial role in HIV testing and education through different approaches, such as campaigns.

The uppermost incidences of HIV/AIDS were identified in 15-24-year-olds, followed by 25-34 years of age; this could be due to the fact that it is the most sexually active age group. It is reported that worldwide, almost half of all new infections with HIV are in people aged 15-24 years.<sup>19</sup> Data from Debre Elias Social Affairs Office showed that most of the migrants were dominantly young age groups. People within these age groups may have unprotected sex with more than one sexual partner which might contribute to the increase in HIV infection. This study was supported by a study.<sup>20</sup>

HIV/AIDS infections were higher in females (61.4%) than males (38.6%), giving a male-to-female ratio of 1:1.6. Gender differences in HIV/AIDS infection prevalence obtained in the present study showed a similar pattern to two studies,<sup>21,22</sup> in which HIV prevalence rate for adult women was almost double that for male, which represent female to male ratio of 2:1. A study done by the Ethiopia Demographic and Health Survey indicated HIV/AIDS prevalence in adults was of 1.9% in females and to 1.0% in males.<sup>23</sup>

This is due to greater biological susceptibility in females to HIV infection through heterosexual intercourse than in males. Females' greater biological susceptibility is due to the presence of more exposed surface areas in the female genital tract than males, the presence of HIV is higher in seminal fluids than vaginal fluids at the time of sexual intercourse, the greater amount of semen exchange than vaginal fluid, and the wall vaginal cell during intercourse for women was highly injured compared to men.<sup>24</sup>

KAP studies are very useful tools prior to any intervention to assess the extent to which individuals or communities are ready to adopt risk-free behaviors and valid KAP about HIV/AIDS and ART use are important in light of the increasing epidemic. This study was the first study on HIV/AIDS and ART use-related KAP among patients in Debre Elias town. The majority of HIV/AIDS patients in the Debre Elias Health Center have good knowledge, positive attitude and good practices towards HIV/AIDS and ART use. Similarly, studies conducted in Africa (*e.g.*, Ghana and Ethiopia) show that level of knowledge regarding HIV/AIDS among sexually active community members are high.<sup>25,26</sup> People's new knowledge of HIV and AIDS led them to use condoms more often, and fewer sex workers got HIV.<sup>27</sup>

Knowledge, attitude and perceptions of 185 HIV/AIDS patients were assessed in Maiduguri (north-east Nigeria). Of these, 78% of respondents had good knowledge of the causative agents of HIV/AIDS and 90% had good knowledge of HIV transmission.<sup>28</sup> As indicated in the present study, 73.4% of study participants responded that proper use of condoms is protective for HIV transmission. This is supported by a similar study;<sup>29</sup> 82.1% of the study participants agreed that proper use of condoms can protect from HIV/AIDS transmission.

Another study that was carried out in Yola, Nigeria, showed good knowledge of the use of condoms for HIV prevention, and transmission was 88.1% to prevent the spread of HIV/AIDS.

Furthermore, 87.8% of participants believed that abstaining from sex is a very good preventive method of HIV/AIDS transmission.<sup>30</sup> Survey data obtained from 18 African countries showed that sexual abstinence and the use of condoms are important components to restrict the spread of HIV infection in developing countries.<sup>31</sup>

Many people in Ethiopia are aware of HIV and AIDS. However, the change of behavior that should have resulted from such awareness is regrettably not there. This is partly because of a lack of proper community facilitation. Knowledge about a development issue does not always result in taking action. Knowledge is only likely to change our behavior when the right level of motivation is created through good facilitation. That funding didn't influence the number of sex partners that people had, the age at which they started having sex, or teenage pregnancy rates.<sup>32</sup>

As shown in this study, most of the respondents had good knowledge about ART. The majority of participants (87.7%) believed that HIV/AIDS patients taking ART drugs can transmit HIV, and ARTs are not drugs to cure HIV/AIDS (82.6%). Moreover, 88% of them stated that taking ART on a therapeutic level can lead to a disease progression and the majority of participants (92.7%) believed that ART medication should be taken throughout the patient's life. This was comparable to a study done in a Nigerian treatment clinic.<sup>29</sup> In contrast to this, some of the study participants had an opposing attitude towards ART medication. For instance, 32.8% of the study participants were not convinced by ART benefits and 28.1% of respondents believed that it is shameful for HIV/AIDS patients to take ART drugs. Moreover, 26% of them agreed that ART treatment is not for curing medications to HIV infection, and this led to a negative attitude towards ART adherence. So, effective counseling and follow-up are required to ensure ART therapy for HIV/AIDS as intended.<sup>29</sup> Therefore, by lowering viral load in sexually active individuals, HIV transmission in the community may decrease and the availability of ARV may encourage voluntary counseling and thus, help change sexual attitudes and practices.

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## Conclusions

This study investigates the incidence of HIV/AIDS and ART use among patients in the Debre Elias district. It can be concluded that HIV incidence is increasing every year, and females and the age group 15-24 are more disposed to HIV infections. Even though there are a large number of efforts to disseminate the basic concept to prevent and control HIV/AIDS incidence and ART use, the transmission of the disease is still increasing. Therefore, continued awareness creation programs are required to bring the desired behavioral changes and to correct misconceptions.

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## References

1. World Health Organization. HIV/AIDS. 2021. Available from: <https://www.who.int/news-room/fact-sheets/detail/hiv-aids>
2. Wang H, Wolock T, Carter A, et al. Estimates of global, regional and national incidence, prevalence and mortality of HIV;1980-2015. *Lancet HIV* 2016;3:361-87.
3. UNICEF. Children, HIV and AIDS. UNICEF. 2018.
4. Fishbein M. The role of theory in HIV prevention. *AIDS Care* 2000;12:273-8.
5. Christian H, Juergen R. HIV/AIDS. 2015/2016, Medizin Fokusverlag, Hamburg. 3rd edition, 2015/2016;276-315.

6. Bicego G. Estimating adult mortality rates in the context of the AIDS epidemic in sub-Saharan Africa: analysis of DHS sibling histories. *Health Transit Rev* 1997;7:7-22.
7. Campbell ID, Rader AD. HIV counselling in developing countries: the link from individual to community counselling for support and change. *Br J Guid Counc* 1995;23:33-43.
8. Campbell I. Human capacity development for response to HIV. Plenary presentation at the 2008 PEPFAR HIV/AIDS Implementers' Meeting, Kampala, Uganda. 2008. Available from: [https://www.affirmfacilitators.org/docs/Ian\\_Campbell\\_Speaker\\_Notes\\_with\\_Slides\\_4June2008\\_HCD.pdf](https://www.affirmfacilitators.org/docs/Ian_Campbell_Speaker_Notes_with_Slides_4June2008_HCD.pdf)
9. Pérez J, Pérez D, Gonzales I, et al., Approaches to the management of HIV/AIDS in Cuba. World Health Organization, 2004.
10. Moreno R, Nababan HY, Ota E, et al. Structural and community-level interventions for increasing condom use to prevent the transmission of HIV and other sexually transmitted infections. *Cochrane Database Syst Rev* 2014;2014.
11. Vian T, Semrau K, Hamer DH, et al. HIV/AIDS-related knowledge and behaviors among most-at-risk populations in Vietnam. *he Open AIDS J* 2012;6:259-65.
12. UNAIDS. UNAIDS Strategy. 2017. Available from: <http://www.unaids.org/en/goals/unaidsstrategy>
13. Federal HIV/AIDS Prevention and Control Office. HIV prevention in Ethiopia. National road map 2018-2020. Addis Ababa, Ethiopia; 2018;1-52. Available from: [https://ethiopia.unfpa.org/sites/default/files/pub-pdf/HIV%20Prevention%20in%20Ethiopia%20National%20Road%20Map%202018%20-%202020%20FINAL\\_FINAL.pdf](https://ethiopia.unfpa.org/sites/default/files/pub-pdf/HIV%20Prevention%20in%20Ethiopia%20National%20Road%20Map%202018%20-%202020%20FINAL_FINAL.pdf)
14. Federal HIV/AIDS Prevention and Control Office. Guidelines for HIV counseling and testing in Ethiopia. FMOH, Addis Ababa, Ethiopia; 2007.
15. Sida-Amhara Rural Development Programme. Building Ethiopia's future: the Sida-Amhara rural development programme. Bahir Dar, Ethiopia; 2010.
16. Daniel WW. Biostatistics: A foundation for analysis in the health science. 7th ed. New York, USA, John Wiley and Sons; 1999:155.
17. Central Statistical Agency (CSA) [Ethiopia] and ICF. Ethiopia Demographic and Health Survey 2016. Addis Ababa, Ethiopia, and Rockville, Maryland, USA; 2016.
18. Assefa Y, Jerene D, Lulseged S, et al. Rapid scale-up of antiretroviral treatment in Ethiopia: Successes and system-wide effects. *PLoS Med* 2009;6: e1000056.
19. Marston C, King E. Factors that shape young people's sexual behaviour; a systematic review. *Lancet* 2006; 368:1581-6.
20. Olaniran O, Hassan-Olajokun M, Oyovwevotu R, Agunlejika M. Prevalence of tuberculosis among HIV/AIDS patients Obafemi Awolowo University Teaching Hospital. *Int J Bio Med Res* 2011; 2:874-77.
21. Kenya National Bureau of Statistics. Kenya demographic and health survey, 2008-2009. KNBS 2010.
22. Sintayehu F, Wondu T, Getnet A. Prevalence and determinants of TB and HIV co-infected patients in South Ethiopia. *JIDC* 2015;9:898-904.
23. Ethiopia Demographic and Health Survey. HIV/AIDS in Ethiopia. CSA, Addis Ababa, Ethiopia; 2011.
24. Amare D. Tuberculosis and HIV Coinfection among patients on tuberculosis treatment at Fenote Selam Hospital, North west Ethiopia. *Global J Med Res* 2015;15:1.
25. Abruquah HH, Bio FY. HIV/AIDS: knowledge, attitude and practice of school adolescents in the Kwaebibirem district of Ghana. *J Sci Technol* 2008;28:10-8.
26. Andargie G, Kassu A, Moges F, et al. Low prevalence of HIV infection, and knowledge, attitude and practice on HIV/AIDS among high school students in Gondar, Northwest Ethiopia. *Ethiop J Health Dev* 2007;21:179-82.
27. Cohen PT, Sande MA, Volberding PA (eds). The AIDS knowledge base. Waltham, Mass.: Medical Publishing Group; 1990.
28. Ajayi B, Moses A, Gashau W, Omotara B. Assessment of knowledge, perception and attitude of PLWHA towards HIV/AIDS in Maiduguri, North east Nigeria. *Int J Infect Dis* 2013;12:1382-90.
29. Olowookere S, Fatiregun A, Adewole L. Knowledge and attitudes to HIV/AIDS and Antiretroviral Therapy among patients at Nigerian treatment clinic. *JIDC* 2012;6:809-16.
30. Olutayo F, Martins L, Lekhraj R, et al. Knowledge and attitudes of adult HIV positive patients to HIV/AIDS in Yola, Nigeria. *J Pub Health Epi* 2015;7:241-8.
31. Cleland J, Ali MM. Sexual abstinence, contraception, and condom use by young African women: a secondary analysis of survey data. *Lancet* 2006;368:1788-93.
32. Lo N, Lowe A, Bendavid E. Abstinence funding was not associated with reductions in HIV risk behavior in sub-Saharan Africa. *Health Affairs* 2016;35.