

# HIV-Positive Status Disclosure to Sexual Partner and Associated Factors Among Adult HIV-Positive Patients in Debre Markos Town, 2019

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**Background:** Human immunodeficiency virus (HIV) positive status non-disclosure to a sexual partner is a public health problem where a high prevalence of HIV infection is reported in a region with poor partner disclosure status. This study aimed to assess HIV-positive status disclosure to sexual partners and associated factors among adult HIV clients at Debre Markos town, Amhara Regional State Ethiopia, in 2019.

**Methods:** A facility-based cross-sectional study was conducted among 406 adult HIV-positive clients in Debre Markos town from September 1 to 30, 2019. Epidata version 3.1 for data entry and SPSS version 25 for data analysis were used. Bivariable and multivariable logistic analyses at ( $p < 0.05$ ) were performed.

**Results:** From 421 study participants, 406 were participated giving response rate of 96.4%. The proportion of HIV status disclosure to sexual partner was 92.6%. Male sex (AOR = 2.863, 95% CI = 1.147–7.146), urban residence (AOR = 2.438, 95% CI = 1.032–5.759), knowing sexual partner's HIV status (AOR = 2.749, 95% CI = 1.015–7.441), good anti-retroviral medication adherence status (AOR = 2.445, 95% CI = 1.023–5.845), and being a member of an anti-HIV club (AOR = 3.07, 95% CI = 1.314–7.171) were factors significantly associated with HIV-positive status disclosure at  $p$  value  $< 0.05$ .

**Conclusions and Recommendation:** The proportion of HIV-positive status disclosure to sexual partners was high. This study recommended that it is better to promote antiretroviral treatment adherence counseling, mutual partner HIV testing, and membership of anti-HIV/acquired immune deficiency syndrome (AIDS) club through extensive health education with particular attention given to females and rural residents.

**Keywords:** human immunodeficiency virus; HIV, acquired immune deficiency syndrome; AIDS, disclosure status, sexual partner

## Introduction

The issue of human immunodeficiency virus (HIV) status disclosure is very important because of its potential effects for prevention and its relation to confidentiality as a human right. Disclosure status is a process of communicating potentially stigmatizing and hidden information to increase one's psychological well-being, and in the case of disclosure to sexual partners, to preserve the quality of relationships. It was found that the incidences and determinants of the disclosure have not been comprehensively reported, particularly in hyperendemic settings.<sup>1</sup> Efforts to promote disclosure status help to improve HIV prevention and control by encouraging safer sexual practice, initiating partners for HIV testing, and increasing. Studies found that higher HIV

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transmission risk is reported in a low HIV prevalence region with poor partner disclosure status as compared with lower HIV transmission risk in a high HIV prevalence region with better disclosure status to the sexual partner.<sup>2</sup> Knowing HIV-positive status along with disclosure has a significant implication in providing a gateway for ending up the HIV epidemic and treatment efforts as it allows access to treatment services, change behavior, and create awareness in the practice of safer sex behavior.<sup>1-3</sup> The World Health Organization has also recommended that all HIV-positive patients should immediately disclose their HIV-positive status to their prospective sexual partners.<sup>4</sup> Studies showed that HIV status non-disclosure to male partners increased the risk of infant HIV transmission and there was low transmission risk in a high HIV prevalence region with better partner HIV disclosure status.<sup>2</sup> In Ethiopia, lack of disclosure to a sexual partner had shown to limit women's ability to participate in the prevention of mother-to-child HIV transmission programs.<sup>5</sup> And a higher percentage of poor HAART adherences were reported among HIV-positive patients who did not disclose their HIV status.<sup>6</sup> Media and Anti-HIV clubs increased public awareness towards HIV/AIDS and helps as a contributor of HIV status disclosure.<sup>7</sup> Previous studies had recommended assessing disclosure status by including newly-diagnosed HIV-positive patients. To fill this gap, the current study aimed to assess factors affecting disclosure status to sexual partners by including those newly HIV-positive diagnosed patients.

## Methods

### Study Design and Settings

A facility-based cross-sectional study was conducted from September 1–30/7/2019 in Debre Markos ART clinics. Debre Markos is the administrative city of East Gojjam Zone in the Amhara region in Ethiopia and located 300 km from Addis Ababa, the capital city of Ethiopia, and 265 km from Bahir-Dar, the capital city of Amhara Regional State. This town has 01 referral hospital, 04 governmental health centers. There were 5088 HIV-positive patients on ART follow-care during the study period.

### Source Population

All adult HIV-positive patients who had ART follow up care at Debre Markos town ART clinics during the study period.

## Study Population

All adult HIV-positive clients who were on ART follow-up care and who had a sexual partner during their HIV diagnosis and were available during the study period at Debre Markos town ART clinics.

### Inclusion Criteria

Aged  $\geq 18$  years; have a sexual partner during HIV diagnosis; and being on ART follow-up care for at least one-month's duration during the data collection period.

### Exclusion Criteria

The couple tested HIV-positive patients were excluded from the study.

## Sample Size Determination and Sampling Technique

The sample size was calculated by using single population proportion formula, which considers the proportion of HIV-positive status disclosure 52.6% from previous studies conducted in Ethiopia<sup>9</sup> with 5%, a marginal error and 5% level of significance at 95% confidence interval:

$$n = \frac{(Z\alpha/2)^2 p(1-p)}{d^2}$$

$$n = \frac{(1.96)^2 0.526(0.474)}{0.05^2} = 383$$

Where

$(Z\alpha/2)^2$  = level of significance at 95% confidence interval

P = the proportion of HIV-positive status disclosure = 0.526

d2 = a marginal error = 0.05. By adding 10% non-response rates, the final sample size was 421. The sample size was proportionally allocated to each RAT clinic based on their total numbers of ART users and a consecutive sampling technique was employed to select the study participants.

## Study Variables

### Dependent Variable

HIV-positive status disclosure to sexual partner

### Independent Variables

Socio-Demographic Related Factors: Age, sex, marital status, ethnicity, religion, residence, occupation, educational status, living with a sexual partner, and having children.

**Clinically Related Factors:** Health status at the time of HIV diagnosis (measured from self-reported), baseline World Health Organization's clinical stages of the disease, and duration on ART follow up care, type of HIV testing (taken from patients' card review)

**Partner Related Factors:** knowing the partner's HIV status, prior discussion about HIV testing, having risky sex before disclosure.

**Social Related Factors:** Being a member of the anti-HIV/AIDS club, see a public HIV seropositive status disclosure and use of substances.

## Operational Definition

**Sexual Partner:** Is someone's husband/wife, or someone's girlfriend or boyfriend.

**HIV-Positive Status Disclosure to Sexual Partner:** In this study, it is defined as when an HIV-positive person told all his/her sexual partners that he/she is HIV-positive. It was measured by asking yes or no questions.

**Delayed Disclosure:** In this study, it is defined when an HIV-positive person disclosed after one month their HIV-positive diagnosis to their sexual partner/s.

**Risky Sexual Practice:** defined as when an HIV-positive individual had unprotected sex (sex without condom) with a sexual partner before disclosing his/her HIV-positive status.

## Data Collection Tools and Procedure

Data were collected by a structured interviewer-administered questionnaire which was adapted from related studies conducted in Ethiopia.<sup>8,9</sup> The questionnaire was first prepared in English then translated into the local language (Amharic) and back to English to assure its consistency and the Amharic version was used for the data collection. Five ART trained, BSc nurses were recruited for data collection and 2 BSc. Nurses were recruited for supervision.

## Data Collection Procedure

First study participants were identified in terms of the inclusion and exclusion criteria by using both medical records and patient interview approach while they came to for their medical appointment. Then after providing adequate information about the purpose of the study, they were requested to participate in the study. Those that agreed to participate after written informed consent was obtained were interviewed on exit after they had received their treatment from the health care providers. For those

study participants who cannot read and write, a hand-signature method mark on the document was applied to take their consent form.

## Data Quality Assurance

A pre-test was done on 5% (21) of the sample size in Dejene health center ART clinic one week before the actual data collection and any ambiguity, confusion, difficult words, and differences in understanding were revised and corrected based on pre-test experience. Then training of data collectors and supervisors on objectives, questionnaires, and ways of collecting the data was given for one day before the actual data collection time. Before proceeding with the interviewing, client confidentiality was upheld and a private room was offered. Before entry, data were checked for completeness and coded.

## Data Processing and Analysis

Data entry was made using Epidata 3.1 Software and exported to the SPSS version 25 for analysis. Before the analysis, data were cleaned for possible errors. Model assumption of logistic regressions and Hosmer and Lemeshow goodness of model fitness was checked. The Bivariable analysis was carried out to identify candidate variables for multivariable analysis. Variables with p-value < 0.25 in Bivariable analysis were included in multivariable logistic regression. Then multiple logistic regression analysis using forward selection methods was performed and investigates independent predictors by controlling for possible confounders. AOR at 95% CI with p-value < 0.05 was estimated to identify the associated factors on multivariable logistic regression.

## Ethical Consideration

First, the ethical clearance letter was obtained from the Ethical Review Committee of the Debre Markos University, College of Health Science. A permission letter was obtained from each health facility administrative body and given to the respective ART unit. Before data collection the study participants were informed about the purpose of the study, written consent was taken from each study participant, and that this study was conducted following the Declaration of Helsinki. For those study participants who could not read and write the consent form was read to them and they signed with their fingertip. The privacy and confidentiality of the respondents were ensured by excluding their name on the questionnaire and interviewing them in a private room that was

free from any interruption and could not be observed or heard by other people within the facility environment.

## Result

### Socio-Demographic Characteristics

From the total study participants, 406 were participated giving a response rate of 96.4%. The median age of the study participants was 35 years. About 207 (51%) study

participants were females and 223 (54.9%) were urban residents. From the study participants, 131 (32.3%) were attended secondary school and above (Table 1).

### Clinical Condition, Partner and Social of Related Factors

From the study participants, 221 (54.4%) were sick at the time of diagnosis and 207 (51%) were on WHO's clinical

**Table 1** Sociodemographic Characteristics of Adult HIV-Positive Clients on Follow Up Care at ART Clinics in Debre Markos Town, in 2019 (n = 406)

| Variables                  | Category                 | No  | %    | X <sup>2</sup> test, P value    |
|----------------------------|--------------------------|-----|------|---------------------------------|
| Age                        | 18–27                    | 66  | 16.3 | –                               |
|                            | 28–37                    | 177 | 43.6 |                                 |
|                            | ≥ 38                     | 163 | 40.1 |                                 |
| Sex                        | Male                     | 199 | 49   | X <sup>2</sup> =0.013, p= 0.008 |
|                            | Female                   | 207 | 51   |                                 |
| Residence                  | Urban                    | 223 | 54.9 | X <sup>2</sup> =0.055, p=0.029  |
|                            | Rural                    | 183 | 45.1 |                                 |
| Religion                   | Orthodox                 | 383 | 94.3 | –                               |
|                            | Protestant               | 17  | 4.2  |                                 |
|                            | Muslim                   | 6   | 1.5  |                                 |
| Ethnicity                  | Amhara                   | 397 | 97.8 | –                               |
|                            | Oromo                    | 6   | 1.5  |                                 |
|                            | Tigre                    | 3   | 0.7  |                                 |
| Marital status             | Never married            | 58  | 14.3 | X <sup>2</sup> =0.056, p=0.048  |
|                            | Ever married             | 348 | 85.7 |                                 |
| Educational status         | Unable to read and write | 122 | 30   | –                               |
|                            | Able to read and write   | 51  | 12.6 |                                 |
|                            | Primary school           | 102 | 25.1 |                                 |
|                            | Secondary and above      | 131 | 32.3 |                                 |
| Occupations                | Unemployed               | 234 | 57.6 | X <sup>2</sup> =0.341, p=0.199  |
|                            | Employed                 | 172 | 42.4 |                                 |
| Has children               | No                       | 123 | 30.3 | X <sup>2</sup> =0.061, p=0.037  |
|                            | Yes                      | 285 | 69.7 |                                 |
| Living with sexual partner | No                       | 180 | 44.3 | X <sup>2</sup> =0.011, p=0.009  |
|                            | Yes                      | 226 | 55.7 |                                 |

stage III–IV of the disease. About 252 (67%) of the study participants disclosed their HIV-positive status to a sexual partner after beginning antiretroviral treatment. Similarly, the majority of the study participants (96.3% and 71.3%) did not use substances and had no history of risky sexual practice (Table 2).

## Proportion of HIV-Positive Status Disclosure to Sexual Partner

In this study, 376 (92.6%) of the study participants disclosed their HIV-positive status to a sexual partner; of

these, 301 (74.1%) disclosed after one month of their initial HIV diagnosis (Figure 1).

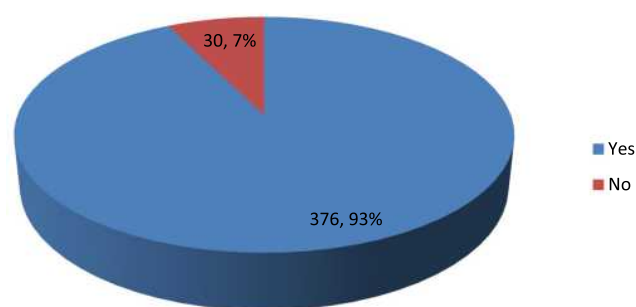
## Reasons Were Given by the Study Participants' to Disclose and Not to Disclose to Sexual Partner/s

In this study 126 (33.5%) participants had reported that not to transmit the disease was the main reason to disclose to their sexual partner/s. Similarly, the main reason not to disclose was fear of divorcing (18; 60%) (Table 3).

**Table 2** Clinical Condition, Partner and Social Related Factors of Adult HIV-Positive Clients on Follow Up Care at ART Clinic, in Debre markos Town Public, in 2019 (n = 406)

| Variables  | Category     | Frequency | Percentage | X <sup>2</sup> test, P value   |
|--|--------------|-----------|------------|--------------------------------|
| Health status at HIV diagnosis                                   | Sick         | 221       | 54.4       | X <sup>2</sup> =0.704, p=0.375 |
|  | Well         | 185       | 45.6       |                                |
| Baseline WHO stage of the disease                                | Stage I–II   | 199       | 49         | X <sup>2</sup> =0.450, p=0.248 |
|  | Stage III–IV | 207       | 51         |                                |
| Type HIV testing   | VCT          | 200       | 49.3       | X <sup>2</sup> =0.022, p=0.014 |
|  | PICT         | 206       | 50.7       |                                |
| Knowing partner HIV status                                       | No           | 241       | 59.4       | X <sup>2</sup> =0.020, p=0.012 |
|  | Yes          | 165       | 40.6       |                                |
| Having risky sexual practice before disclosure to sexual partner | No           | 268       | 71.3       | –                              |
|  | Yes          | 108       | 28.7       |                                |
| ART adherence status   | Poor         | 212       | 52.2       | X <sup>2</sup> =0.056, p=0.032 |
|  | Good         | 194       | 47.8       |                                |
| Duration of ART follow up care in months                         | 1–12 months  | 215       | 53         | –                              |
|  | 13–25 months | 96        | 23.6       |                                |
|  | ≥ 26 months  | 95        | 33.4       |                                |
| Prior discussion on HIV testing with partner                     | No           | 219       | 53.9       | X <sup>2</sup> =0.035, p=0.020 |
|  | Yes          | 187       | 46.1       |                                |
| See public HIV <sup>+</sup> status disclosure                    | No           | 190       | 46.5       | X <sup>2</sup> =0.183, p=0.094 |
|  | Yes          | 216       | 53.2       |                                |
| Being a member of anti- HIV/ADIS club                            | No           | 186       | 45.8       | X <sup>2</sup> =0.056, p=0.035 |
|  | Yes          | 220       | 54.2       |                                |
| Use of Substance   | No           | 391       | 96.3       | X <sup>2</sup> =0.913, P=0.694 |
|  | Yes          | 15        | 3.7        |                                |

## HIV positive status disclosure



**Figure 1** Proportion of HIV-positive status disclosure to sexual partner among adult ART clients at Debre Markos Town ART clinics, East Gojjam, Amhara Regional State, Ethiopia, 2019 (n = 406).

## Factors Associated with HIV-Positive Status Disclosure to Sexual Partner

Variables such as sex, marital status, residence, living with sexual partners, having children, ART medication adherence, type of HIV testing, prior discussion about HIV testing, knowing sexual partners HIV status, and being a member of the anti-HIV club were a candidate for multi-variable analysis. Variables that showed significant associated in the multiple logistic regression analysis were male sex (AOR = 2.863, 95% CI = 1.147–7.146), urban residence (AOR = 2.438, 95% CI = 1.032–5.759), knowing sexual partner's HIV status (AOR = 2.749, 95% CI, = 1.015–7.441), Good anti-retroviral medication adherence status (AOR = 2.445, 95% CI, = 1.023–5.845), and being

**Table 3** Showed Reasons Given to Disclose and Not to Disclose HIV-Positive Status to Sexual Partner/s by Adult HIV-Positive Clients on ART Follow Up Care at a Public ART Clinic in Debre Markos Town, 2019 (n = 376)

| Respondents Reason to Disclose      | No  | %    |
|-------------------------------------|-----|------|
| Not to transmit the disease         | 126 | 33.5 |
| To get support                      | 78  | 20.7 |
| To adhere to treatment              | 115 | 30.6 |
| Due to illness                      | 57  | 15.2 |
| Respondents reason not to disclose  | No  | %    |
| Fear of stigma                      | 4   | 13.3 |
| Fear of divorcing                   | 18  | 60   |
| Fear of breaking of confidentiality | 8   | 26.7 |

member of anti-HIV club (AOR = 3.07, 95% CI = 1.314–7.171).

Males were 2.9 times more likely than females to disclose HIV-positive status disclosure to the sexual partner. Study participants who lived in urban were 2.4 times more likely to disclose HIV seropositive status disclosure to sexual partner compared to these who lived in rural. The odds of HIV-positive status disclosure to sexual partners were 2.7 times higher among study participants who knew their sexual partner's HIV status when compared to those who did not know their sexual partner's HIV status. Study participants who have good anti-retroviral medication adherence status were 2.4 times more likely to disclose HIV-positive status disclosure to a sexual partner than study participants who have poor anti-retroviral medication adherence status. The odds of HIV-positive status disclosure to sexual partner was 3 times higher among study participants who were member of an anti-HIV club compared to these study participants who were not members of an anti-HIV club (Table 4).

## Discussion

The current study revealed that the proportion of HIV-positive status disclosure to a sexual partner was 92.6% (95% CI = 90–95%) which is almost consistent with the study finding in Zimbabwe (93%),<sup>10</sup> higher than study findings in China (51%) and Uganda (57%).<sup>11,12</sup> This discrepancy might be due to differences in sample size and study population characteristics. When compared with a study conducted in Ethiopia, it is higher than a study finding in Michelle Hospital (57.4%),<sup>9</sup> in Bale Zone Hospitals (52.6%),<sup>8</sup> in Woldia Hospital (76.6%),<sup>13</sup> and Hawassa University Referral Hospital (85.7%).<sup>14</sup> The possible explanation for such a difference might be the difference in the time of the study. It is expected that with time there will be a progressive improvement in disclosure counseling service which increase disclosure status. The study also found that variables such as male sex, urban residence, knowing partner's HIV status, Good ART adherence status, and being a member of the anti-HIV club were independent factors associated with HIV-positive status disclosure to sexual partner/s. Males were 2.9 times more likely than females to disclose HIV-positive status to a sexual partner. This finding is supported by studies done in South Africa and Tanzania.<sup>15,16</sup> This indicated that males are dominant over females which affects females' disclosure ability due to fear of partner's negative reaction. Urban residents were 2.4 times more



**Table 4** Bivariate and Multivariate Analysis of Factors Associated with HIV Status Disclosure to Sexual Partner Among Adult HIV-Positive Clients on ART Follow Up Care at a Public ART Clinic in Debre Markos Town, 2019 (n = 406)

| Variables                     |               | HIV Status Disclosure |    | COR (95% CI)        | AOR (95% CI)        | P value |
|-------------------------------|---------------|-----------------------|----|---------------------|---------------------|---------|
|                               |               | Yes                   | No |                     |                     |         |
| Sex                           | Male          | 191                   | 8  | 2.839 (1.233–6.538) | 2.863 (1.147–7.146) | 0.024*  |
|                               | Female        | 185                   | 22 | 1.00                | 1.00                |         |
| Marital status                | Ever married  | 50                    | 8  | 2.371 (1.001–5.615) | 1.799 (0.667–4.853) | 0.246   |
|                               | Never married | 326                   | 22 | 1.00                | 1.00                |         |
| Residence                     | Urban         | 212                   | 11 | 2.233 (1.034–4.823) | 2.438 (1.032–5.759) | 0.042*  |
|                               | Rural         | 164                   | 19 | 1.00                | 1.00                |         |
| Living with sexual partner    | Yes           | 216                   | 10 | 2.70 (1.230–5.926)  | 2.16 (0.912–5.114)  | 0.800   |
|                               | No            | 160                   | 20 | 1.00                | 1.00                |         |
| Knows partners HIV status     | Yes           | 159                   | 6  | 2.931 (1.171–7.337) | 2.749 (1.015–7.441) | 0.047*  |
|                               | No            | 217                   | 24 | 1.00                | 1.00                |         |
| Has children                  | Yes           | 267                   | 16 | 2.143 (1.011–4.541) | 2.152 (0.937–4.945) | 0.071   |
|                               | No            | 109                   | 14 | 1.00                | 1.00                |         |
| ART adherence status          | Good          | 185                   | 9  | 2.26 (1.009–5.063)  | 2.445 (1.023–5.845) | 0.044*  |
|                               | Poor          | 191                   | 21 | 1.00                | 1.00                |         |
| Type of HIV test              | PICT          | 179                   | 21 | 2.568 (1.146–5.753) | 2.359 (0.977–5.692) | 0.056   |
|                               | VCT           | 197                   | 9  | 1.00                | 1.00                |         |
| Prior discussion of HIV test  | Yes           | 179                   | 8  | 2.499 (1.085–5.754) | 2.386 (0.966–5.893) | 0.059   |
|                               | No            | 197                   | 22 | 1.00                | 1.00                |         |
| Being member of anti-HIV club | Yes           | 209                   | 11 | 2.162 (1.001–4.668) | 3.07 (1.314–7.171)  | 0.010*  |
|                               | No            | 167                   | 19 | 1.00                | 1.00                |         |

**Note:** NB:\* Stands for variables that showed significant association in the multiple logistic analyses.

likely to disclose sexual partners than rural residents which is also supported by a study done in Uganda.<sup>12</sup> This might be that urban residents will have adequate access to HIV related information than rural residents. Similarly, disclosure to sexual partner/s was 2.4 times more likely among HIV-positive patients who had good medication adherence status compared to those having poor medication adherence status which is supported by a study done in Togo.<sup>17</sup> This could be respondents received adequate information and encouragement from care givers to create favorable psychological conditions.

Respondents who knew their sexual partner's HIV status were 2.7 times more likely to disclose than those who did not know their partner's HIV status. This finding is supported by studies conducted in Woldia and Bale zone hospital, in Ethiopia<sup>8,13</sup> and studies done in Nigeria and in Togo.<sup>17,18</sup> The possible explanation for this might be explained by aware of sexual partner's HIV status may encourage partners to disclose to prevent the transmission and to support each other. The odds of HIV disclosure to a sexual partner is 3.1 times more likely among study participants who are members of an anti-HIV clubs than

these who are not, which is also supported by a study conducted in Ethiopia at Woldia hospital.<sup>13</sup>

## Limitation of the Study

The reported nature of the data collection approach could be affected by social desirability bias which is an important issue with regards to a sensitive topic such as HIV-positive status disclosure. Another limitation of this study is it does not address variables like health service and provider-related factors.

## Conclusion

The study revealed that the proportion of HIV-positive status disclosure to sexual partners was high. Variables such as male sex, urban resident, knowing partners HIV status, good ART adherence status, and being a member of anti-HIV/AIDS club were significant association with HIV-positive status disclosure to a sexual partner.

## Recommendation

Health care providers should promote ongoing antiretroviral treatment adherence counseling services and be a member of an anti-HIV/AIDS club through extensive health education particularly, for females and rural residents. Moreover, health education programs should be focused on promoting mutual partner HIV testing to increase the awareness of partner's HIV status. Government and other relevant stakeholders should focus on promoting HIV disclosure status for the planning of future interventions among women and rural residents and to encourage mutual partner HIV testing widely. It is better to carry out further studies to address variables such as health service and provider-related factors.

## Abbreviations

AIDS, Acquired Immune Deficiency Syndrome; ART, Antiretroviral Treatment; DMHC, Debre Markos Health Center; DMRH, Debre Markos Referral Hospital; EDHS, Ethiopian Demographic and Health Survey; HAART, Highly Active Antiretroviral Treatment; HDH, Hidase Health Center; HIV, Human Immunodeficiency Virus; PITC, provider-initiated HIV testing and counseling; PLWAHIV, People Living with HIV/AIDS; PMTCT, Prevention of Mother-to-Child Transmission; UNAIDS, Joint United Nations Program on HIV/AIDS; VCT, Voluntary Counseling and Testing; WHC, Wuseta Health Center.

## Data Sharing Statement

The data can be accessed from the corresponding author through the following address mengistubinayew7@gmail.com. The data might be accessed if and only if for research purposes.

## Ethics Approval and Consent to Participate

First, the ethical clearance letter was obtained from the Ethical Review Committee of the Debre Markos University, College of health science. A permission letter was obtained from each health facility administrative body and given to the respective ART unit. The Data collection was made after written consent was taken from each study participant. The privacy and confidentiality of the respondents were ensured by excluding the name on the questionnaire and interviewed them in a private space that is free from interruption and cannot be observed or heard by other people within the facility environment.

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## Author Contributions

Mr. Mengistu Benayew has contributed in the ideal conception, study design, execution, data acquisition, analysis, interpretation, drafting, critical revision, drafting and critically reviewed the manuscript. Except in the ideal conception, Mr. Muluken Teshome, Mr. Haymanot Zeleke, and Mr. Agumas Fentahun were participated in study design, execution, data acquisition, analysis, interpretation, drafting, and critical revision. Moreover, all of authors have reviewed and agreed in all versions of the article before to be summated in this journal and to take responsibility and accountability for the contents of the article.

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## Disclosure

The authors declare that they have no competing interests.



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