



## Determinants of Self Non-disclosure to Sexual Partner Among Adult HIV-positive People Attending ART Center in Public Health Facilities of Dessie Town, Ethiopia, 2022: Case-control Study

**Bezawit Adane<sup>1\*</sup>, Bereket Kefale<sup>2</sup>, Yitayish Damtie<sup>6</sup>, Elisabeth Addisu<sup>2</sup>, Mastewal Arefaynie<sup>2</sup>, Yitbarek Wasihun<sup>3</sup>, Tezera Asfaw<sup>4</sup>, Kefale Mitiku<sup>5</sup> and Melaku Yalew<sup>6</sup>**

<sup>1</sup>Department of Epidemiology and Biostatistics, Department of Public Health, College of Medicine and Health Sciences, Injibara University, Injibara, Ethiopia

<sup>2</sup>Department of Reproductive and Family Health, School of Public Health, College of Medicine and Health Sciences, Wollo University, Dessie, Ethiopia

<sup>3</sup>Department of Health Education and Promotion, School of Public Health, College of Medicine and Health Sciences, Wollo University, Dessie, Ethiopia

<sup>4</sup>School of Medicine, College of Medicine and Health Sciences, Wollo University, Dessie, Ethiopia

<sup>5</sup>Department of Physiology, College of Medicine and Health Sciences, Injibara University, Injibara, Ethiopia

<sup>6</sup>Department of Epidemiology and Biostatistics, Department of Public Health, College of Medicine and Health Sciences, Injibara University, Injibara, Ethiopia

**\*Corresponding Author:** Bezawit Adane, Department of Epidemiology and Biostatistics, Department of Public Health, College of Medicine and Health Sciences, Injibara University, Injibara, Ethiopia.

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### Abstract

**Background:** Despite of different strategies being implemented to prevent and control HIV transmission and disclosure of HIV status is important to reduce HIV-related risk sexual behavior; still it is a major public health problem in Ethiopia. Articles published in this area are disclosure to family or friends, those studies were cross-sectional, and still, there is limited evidence on determinants of self-non-disclosure to a sexual partner in low-income countries like Ethiopia.

**Objective:** The aim of this study was to identify determinants of self-non-disclosure to sexual partners among adult HIV-positive people in public health facilities of Dessie town, Northeast Ethiopia, 2022.

**Method:** Facility-based unmatched case-control study design was conducted among adult HIV-infected people attending ART centers in public health facilities of Dessie town from March 1 to April 30, 2020. A total of 470 adult HIV-infected people were sampled and simple random sampling was employed for selecting study participants based on their average number of clients in a month. A pretested structured questionnaire was used for data collection and data were entered into Epi-data 3.1 version and were exported to STATA version 14 for analysis. Binary logistic regression analysis was used to identify factors associated with HIV results in self-non-disclosure. Odds ratio with a 95% confidence interval was used to declare statistical significance.

**Result:** Determinants of self non-disclosure of HIV status to their sexual partner were; Negative serostatus of the partner, AOR = 0.02 (95% CI : 0.00, 0.16), WHO clinical stage one, AOR = 10.97 (95%CI: 4.33, 27.81) and WHO clinical stage two, AOR = 20.14 (95% CI: 4.78, 84.83), having social support from their family or friends, AOR = 0.16 (95% CI: 0.06, 0.39), attend HIV counseling program, AOR = 0.07 (95% CI: 0.02, 0.18) and minimal depression, AOR = 8.69 (95%CI :3.62, 20.89).

**Conclusions:** Factors that have a significant association with non-disclosure of HIV status to their sexual partner were serostatus of sexual partner, WHO clinical stage, social support, attending HIV counseling, and depression. Continuous emphasis should be given to health care providers to encourage their counseling services for their customers with special attention given to patients whose partners were HIV negative.

**Keywords:** Self Non-disclosure; Adult; HIV-Positive; Dessie; Ethiopia; Case-control Study

## Abbreviations

AIDS: Acquired Immunodeficiency Syndrome; AOR: Adjusted Odds Ratio; BSc: Bachelor of Science; CI: Confidence Interval; CD4: Cluster Differentiation 4; DHS: Demographic and Health Survey; EDHS; Ethiopian Demographic and Health Survey; EFMOH: Ethiopian Federal Minister of Health; GTP: Growth and Transformation Plan; HAART: Highly Active Anti-Retroviral Treatment; HIV: Human Immunodeficiency Virus; PMTCT: Prevention of Mother to Child Transmission; UN: United Nation; VCT: Voluntary Counseling and Testing; Sustainable Development Goals; WHO: World Health Organization

## Introduction

HIV/AIDS is a global public health problem affecting human beings irrespective of their age, sex, socioeconomic status and other factors. Globally, an estimated more than 36 million people were living with HIV in 2015, of which 65 to 70 % were in sub-Saharan African countries. So, HIV education and prevention efforts are needed to prevent new HIV infection [1]. The prevention and control of HIV infection depend on the success of strategies to prevent new infections and treat currently infected individuals [2].

Disclosure of HIV-positive serostatus has been defined as a process of communicating potentially stigmatizing information that had previously been kept hidden in order to increase one's psychological well-being, and in the case of disclosure to sexual partners, to preserve the quality of relationships [2,3]. Self-disclosure also means the process of sharing personal information with other people using verbal or nonverbal communication [4] whereas, non-Disclosing one's HIV status to a sexual partner is never talking honestly about one's sexual orientation, possible drug

use, and results of HIV testing [5]. It involves careful consideration of "to whom" and "when" and depends on preparation and a personal decision [3].

Although the disclosure has a number of benefits, disclosing one HIV-positive result even to a sexual partner makes the decision to disclose a dilemma for individuals infected with HIV [3,6]. An estimated 14 million peoples are unaware of their HIV-positive status. HIV partner notification is an approach that has the potential to improve HIV testing coverage, while also identifying people with undiagnosed HIV infection [7]. Several studies have revealed that up to one-third of individuals diagnosed with HIV infection continue to have unprotected sex, at times without informing their sexual partners, who may be of negative or unknown serostatus [8]. Worldwide, HIV status disclosure rates vary from 7% to 79%. The disclosure rate is notably lower in developing countries than in the developed world (17% vs. 86%, respectively) [5]. Among the studies that reported disclosure rates to current and/or steady partners the average rate of disclosure was 49%, considerably less than the average rate reported in studies conducted in the developed world (79%) [9]. In sub-Saharan Africa, disclosure rates among partners vary between 33% and 93%, depending on the country. The lowest rate was reported in Malawi [1]. A study at Jimma University hospital showed that 5.5% and 9.8% of respondents didn't disclose their serostatus to anyone else and to their sexual partner respectively and 11.9% of the respondents had HIV-negative sexual partners [6].

HIV status disclosure is an important component of HIV prevention as it may motivate partners also want to know their HIV status, reduce HIV-related risk sexual behavior and ultimately

reduce HIV transmission. Disclosure has been shown to result in better adherence to therapy, good clinical outcomes, strengthening of relationships, less anxiety, fewer symptoms of depression, and CD4 recovery following antiretroviral therapy (ART). A recent study showed that serostatus disclosure reduced the risk of HIV transmission by 17.9% to 40.6% relative to non-disclosure [6,10].

Furthermore, disclosure to sexual partners enables couples to make informed reproductive health choices that may lower the number of unintended pregnancies among HIV-positive couples, and even reduce the risk of HIV transmission from the mother to child (MTCT). Not only decreasing the transmission of HIV but it is also associated with improved access to HIV prevention and treatment programs and with better treatment outcomes via improving adherence to ART [10,11].

There is an unmet need for voluntary HIV testing and counseling (VCT) services oriented toward couples because most of these couples do not mutually know their HIV status. This in turn leads to lost opportunities for the prevention of new infections and for the ability of these women to access appropriate treatment, care, and support services where they are available [12].

Factors that determine disclosure or non-disclosure were sociodemographic factors (age, sex, marital status, level of education, occupation, etc.) [6,13-16], psychosocial, cognitive, and behavioral factors (serostatus of sexual partner, no of sexual partner in previous 12 months, WHO clinical staging, alcohol use, taking ART, type of sexual partner, condom use, etc.) [17-23] and client factors (Having attended in HIV counseling program or belonging to a support group, opportunistic infections, post-test counseling on disclosure, number of children, length of time since diagnosed and number of years in marriage/duration lived with the sexual partner) [24-31].

Sustainable Development Goal 3.3 aims to end the epidemics of AIDS by the end of the year 2030 [10,32]. There are different strategies tried so far in order to increase the disclosure rate of HIV-infected people in Ethiopia (Voluntary Counseling and Testing and Provider initiated testing and counseling which are entry points). Extensive post-test counseling, involving them in income-generating activities plays a critical role in prevention

and treatment. Within those programs, emphasis is placed on the importance of HIV status disclosure among HIV-infected clients, particularly to their sexual partners [33].

Even though it was little investigated, the need for context-specific data to drive interventions becomes crucial and previous studies were cross-sectional. This is lacking in Ethiopia, especially in Dessie. As a result, the aim of this study is to identify determinants of self-non-disclosure to sexual partners among adult HIV-infected people in public health facilities of Dessie town.

## Methods and Materials

### Study setting, study design, and population

The study was conducted in public health facilities of Dessie town, Amhara Regional State, Ethiopia from March 1 to April 30, 2022. Dessie is the capital city of South Wollo Zone including its town administration, which is located 401 kilometers to the North of Addis Ababa. According to the town administrative health office report the town had 10 urban and 6 rural kebeles and the estimated population size was 218,471 of which, 102,378 (46.86%) are males and 116,093 (53.14%) are females. An institution-based unmatched case-control study design was conducted.

All adult ART attendants people who don't disclose their HIV status to their sexual partner and are available during the study period were the study population for cases.

### Inclusion and exclusion criteria

#### Inclusion criteria

- **For cases:** All HIV-positive people who were registered in the ART logbook and did not disclose their HIV status to their sexual partners were included in the study.
- **For controls:** All HIV-positive people who were registered in the ART logbook and disclosed their HIV status to their sexual partners were included in the study.

#### Exclusion criteria

- **For cases and controls:** All HIV-positive people who were registered in the ART logbook but, aged less than 18 years and those who interrupt their treatment will be excluded from the study.

### Sample size determination and sampling procedure

The sample size was calculated by considering different factors studied in different parts of Ethiopia as well as other countries. The largest sample size was obtained from the variable “use condom regularly”, which was 427. Therefore, by adding a 10% non-response rate the final sample size was 470 [12]. The study participants were selected by simple random sampling until reaching the final sample size. In order to identify cases and controls preliminary survey was conducted and during the survey, the participants’ medical registration number was recorded and used as the sampling frame.

### Variable measurement

The dependent variable for this study was HIV status Self non-disclosure (Yes/No).

- **Cases:** Those HIV-infected people who don’t disclose his/her HIV status to his/her sexual partner irrespective of the time since HIV infection [10,13].
- **Controls:** Those HIV-infected people who disclose his/her HIV status to his/her sexual partner irrespective of the time since HIV infection [10,13].
- **Depression status of a patient:** It was measured as “no depression”: If Patient Health Questionnaire (PHQ-9) scores less than five, “Minimal depression”: If PHQ-9 score ranges 5-9, “mild depression”: If PHQ-9 score ranges 10-14, “moderately severe depression”: If PHQ-9 score ranges 15-19 and “Severe depression”: If PHQ-9 scores  $\geq$  20 [34].
- **Have perceived stigma:** If respondents answer to perceived stigma questions < the median value and; No perceived stigma: If respondents answer to perceived stigma questions at the median value [35].

### Data collection tools, procedures and quality control

Data were collected through an interviewer-administered questionnaire. The participants were asked for their valuable information after they have finished their follow-up or appointment in a separate room and the data were filled in the questionnaire. Some of the questionnaires were also filled by observing their ART individual folder/card. Two Public Health Officer Supervisors and eight BSc nurses who were currently doing in another health facility were employed as data collectors. The questionnaire was developed in English language and translated to Amharic again back-translated to English to check its consistency. Supervisors and data collectors were trained on the objective of the study, and

how to approach participants and take informed consent. The tool was pre-tested on 5% of the sample in Kombolcha health center coming for the same service. The necessary modification was done according to the result of the pretest and supervisors and principal investigators checked the data.

### Data processing and analysis

After collecting the data, it was checked, coded, cleaned, and entered in Epi data 3.1 and exported to STATA version 14 for analysis. The results were presented using texts, frequency, and percentage. Summary measures were computed for a description of the study population. A binary logistic regression model was used to identify the association between each independent variable and outcome variable and statistical significance was determined using odds ratios with the corresponding p-value.

First Bivariable analysis was done for each independent variable to the outcome variable and those variables resulting p-value less than 0.25 were entered into a multiple logistic regression model. Multi-collinearity between independent variables was checked using variance inflation factor as well as standard error and Hosmer- Lemeshow test was used to check model fitness. In the final model, those variables with a p-value less than 0.05 were considered statistically significant and were presented on the odds ratio (OR), with a 95% confidence interval (CI) to show the strength and direction of the association.

### Ethical approval

The actual data collection was carried out after getting ethical approval from the Ethical review committee of Wollo University, College of Medicine and Health Sciences. In addition, the official letter of cooperation was submitted to selected health facilities, and informed verbal consent was obtained from each respondent prior to enrollment. Each participant was informed about the aim and anyone who is not willing to participate in the study will not be enforced and had the full right to refuse or even withdraw from the study. They were also informed that all data obtained from them would be kept confidential by assigned codes instead of using their name and other personal identifiers and the information is used only for the purpose of the study.

## Results

### Socio-demographic characteristics of respondents

A total of 458 (94 cases and 364 controls) women participated in the study, making the response rate 97.4%. The mean age of

respondents was 35.44 years ( $\pm 6.92$ ). Fifty-nine (62.77%) cases and 259 (71.15%) controls resided in urban area. Forty-nine 49 (52.13%) cases and 178 (48.90%) controls were female. All cases (94) and 245 (67.31%) controls were currently married. Sixty-three (67.02%) cases and 144 (39.56%) controls were Muslim in religion and 84 (89.36%) cases and 262 (71.98%) controls were Amhara in ethnicity. Thirty-nine (41.49%) cases and 77 (21.15%) controls cannot read and write. Regarding occupation, 36 (38.60%) cases and 112 (30.77%) controls were government employees (Table 1).

Variable	Category	Cases (n = 94)	Controls (n = 364)
Sex	Male	45 (47.87)	186 (51.10)
	Female	49 (52.13)	178 (48.90)
Residence	Urban	59 (62.77)	259 (71.15)
	Rural	35 (37.23)	105 (28.85)
Marital status	Married	94 (100.00)	245 (67.31)
	Not married	0 (0.00)	119 (32.69)
Religion	Orthodox	31 (32.38)	192 (52.75)
	Muslim	63 (67.02)	144 (39.56)
	Protestant/catholic	0 (0.00)	28 (7.69)
Ethnicity	Amhara	84 (89.36)	262 (71.98)
	Oromo	0 (0.00)	49 (13.46)
	Tigray	10 (10.64)	53 (14.56)
Educational status	Not read and write	39 (41.49)	77 (21.15)
	Only read and write	15 (15.96)	155 (42.58)
	Grade 1-8	36 (38.3)	86 (23.36)
	Grade 9-12	2 (2.13)	34 (9.34)
	College and above	2 (2.13)	12 (3.30)
Occupation	Governmental employee	36 (38.60)	112 (30.77)
	Merchant	44 (46.81)	89 (24.45)
	Housewife	104 (28.57)	0(0.00)
	Private	59 (16.21)	11 (4.7)

**Table 1:** Sociodemographic characteristics of adult HIV positive people attending ART center in public health facilities of Dessie town, Ethiopia, 2022 (n = 458).

**Psychosocial, cognitive and behavioral characteristics of respondents**

Ninety-two (97.87%) cases and 310 (85.16%) controls had positive sexual partners. Seventy-three (77.66%) cases and 226 (62.09%) controls had one sexual partner. Eleven (11.70%) cases and 30 (8.24%) controls were WHO stage three. Thirty –four (36.17%) cases and 75 (20.60%) controls take alcohol less than once per week. Eighty-four (89.36%) cases and 270 (74.18%) controls did not smoke a cigarette. Twenty-eight (29.79%) cases and 228 (62.64%) controls had minimal depression. In addition, 94 (100%) cases and 334 (91.76%) controls had good knowledge about HIV. Ninety-four (100%) cases and 364 (100%) controls are on HAART. Forty-one (43.62%) cases and 173 (47.53%) controls use condoms during sex. Finally, 68 (72.34%) cases and 304 (83.52%) controls have a regular sexual partner (Table 2).

Variable	Category	Cases (n = 94)	Controls (n = 364)
Serostatus of husband	Positive	92 (97.87)	310 (85.16)
	Negative	2 (2.13)	54 (14.84)
No of sexual partner	0	0 (0.00)	70 (19.23)
	1	73 (77.66)	226 (62.09)
	2	21 (22.34)	49 (13.46)
	3	0 (0.00)	19 (5.22)
WHO stage	Stage 1	64 (68.09)	141(38.74)
	Stage 2	19 (20.21)	193 (53.02)
	Stage 3	11 (11.70)	30 (8.24)
Frequency of alcohol intake	Daily	6 (6.38)	37 (10.16)
	5-6 days/ week	5 (5.32)	23 (6.32)
	1-4 days/ week	26 (27.66)	25 (6.87)
	1-3 days/ week	8 (8.51)	77 (21.15)
	Less than 1 per week	34 (36.17)	75 (20.60)
	Never at all	15 (15.96)	127 (34.89)
No of cigarette per day	0	84 (89.36)	270 (74.18)
	1-3	10 (10.64)	74 (20.33)
	4-5	20 (5.49)	0 (0.00)
Depression	No depression	66 (70.21)	136 (37.36)
	Minimal depression	28 (29.79)	228 (62.64)

Perceived stigma	No	42 (44.68)	176 (48.35)
	Yes	52 (55.32)	188 (51.65)
Knowledge	Poor knowledge	0 (0.00)	30(8.24)
	Good knowledge	94 (100.00)	334 (91.76)
On HAART	No	0 (0.00)	0 (0.00)
	Yes	94 (100.000)	364 (100.00)
Use condom during sex	No	53 (56.38)	191 (52.47)
	Yes	41 (43.62)	173 (47.53)
Social support from family, friend or other	No	46 (63.46)	231 (48.94)
	Yes	48 (51.06)	133 (36.54)
Type of sexual partner	Regular	68 (72.34)	304 (83.52)
	Causal	26 (27.66)	60 (16.48)

**Table 2:** Psychosocial, cognitive, and behavioral characteristics of Sociodemographic characteristics of adult HIV positive people attending ART center in public health facilities of Dessie town, Ethiopia, 2022 (n = 458).

**Client related characteristics**

Eighty-two (87.23%) cases and 232 (63.74%) controls have a number of children 1 to 4. Seventy-seven (81.91%) cases and 293 (80.49) controls live with HIV for about 1-5 years. Looking at the length of stay with a sexual partner 146 (40.11%) cases and 36 (38.30%) controls lived six-ten years. Sixty-four (68.09%) cases and 244 (76.03%) controls have other opportunistic infections. In addition, 76 (80.85%) cases and 138 (37.91%) controls attend counseling programs about HIV. Moreover, 70 (74.47%) cases and 248 (68.13%) controls did not disclose their HIV status to people other than their sexual partners. Ninety-four (100%) cases and controls 252 (69.235) live with their sexual partner (Table 3).

**Determinants of self non-disclosure**

Bivariable and multivariable binary logistic regression analyses were performed to identify determinants of non-disclosure. Variables with a p-value of less than 0.25 in the Bivariable binary logistic regression were entered into multivariable binary logistic

Variable	Category	Cases (n = 94)	Controls (n = 364)
No of child you have	0	0 (0.00)	24 (6.59)
	1-4	82 (87.23)	232 (63.74)
	> = 5	12 (12.77)	108 (29.67)
Years lived with HIV	1-5	77 (81.91)	293 (80.49)
	6-10	13 (13.83)	68 (18.68)
	11-15	0 (0.00)	3 (0.82)
	16-20	4 (4.26)	0 (0.00)
Length of stay with partner	1-5	41 (43.62)	96 (26.37)
	6-10	146 (40.11)	36 (38.30)
	11-15	17 (18.09)	74 (20.33)
	16-20	0 (0.00)	48 (13.19)
Opportunistic Infection	No	30 (31.91)	120 (32.97)
	Yes	64 (68.09)	244 (76.03)
Attend HIV counseling program	No	76 (80.85)	138 (37.91)
	Yes	18 (19.15)	226 (62.09)
Provider told about disclosure	No	33 (35.11)	140 (38.46)
	Yes	61 (64.89)	224 (61.54)
Disclose your HIV status to other than partner	No	70 (74.47)	248 (68.13)
	Yes	116 (31.87)	24 (25.53)
Living with your sexual partner	No	0 (0.00)	112 (30.77)
	Yes	94 (100)	252 (9.23)

**Table 3:** Client-related characteristics of adult HIV positive people attending ART center in public health facilities of Dessie town, Ethiopia, 2022 (n = 458).

regression. Variables eligible for multivariable analysis include the place of residence, serostatus of husband, WHO clinical stage, social support, type of sexual partner, opportunistic infection, attend HIV counseling program, health provider told to disclose, disclose to other than a sexual partner, depression, and perceived stigma. In the final multivariable binary logistic regression analysis, serostatus of partner, social support, WHO clinical stage, attending HIV counseling, and depression had a statistically significant association with non-disclosure of their status to a sexual partner.

The odds of non-disclosure of HIV status to their sexual partner among patients whose partner was negative were 2% lower as compared to those whose husband was positive, AOR = 0.02 (95% CI: 0.00, 0.16). Patients who had WHO clinical stage one were 10.97 times more likely to non-disclosed their status to their sexual partner as compared to patients whose WHO clinical stage was three, AOR = 10.97 (95%CI: 4.33, 27.81). Similarly, Patients who had WHO clinical stage two were 20 times more likely to non-disclosed their status to their sexual partner as compared to patients whose WHO clinical stage was three, AOR = 20.14 (95% CI: 4.78, 84.83). Patients who had social support from their family

or friends had 16% less likely to non-disclosed their status to their sexual partner as compared to patients who had no sexual support, AOR = 0.16 (95% CI: 0.06, 0.39). Patients who attend HIV counseling programs were 7% less likely to non-disclosed their status to their sexual partner as compared to those who did not attend HIV counseling programs, AOR = 0.07 (95% CI: 0.02, 0.18). Patients who had minimal depression were 8.69 times more likely to non-disclosed their status to their sexual partner as compared to patients who had no depression, AOR = 8.69 (95%CI:3.62, 20.89) (Table 4).

Variable	Category	COR (95 % CI)	AOR (95 % CI)
Residence	Rural	1	1
	Urban	0.68 (0.42, 1.09)	0.69 (0.33-1.46)
Serostatus of partner	Positive	1	1
	Negative	0.12 (0.03, 0.52)*	0.02 (0.00, 0.16)*
WHO clinical stage	Stage1	4.6 (2.64, 8.04)*	10.97 (4.33, 27.81)*
	Stage2	3.72 (2.64, 8.04)*	20.14 (4.78, 84.83)*
	Stage3	1	1
Social support	Yes	0.55 (0.35, 0.87)*	0.16 (0.06, 0.39)*
	No	1	1
Type of sexual partner	Regular	1	1
	Causal	0.52 (0.30, 0.87)*	2.40 (0.87, 6.61)
Opportunistic infection	Yes	1.05 (0.64, 1.70)*	0.36 (0.12, 1.14)
	No	1	1
Attend HIV counseling program	Yes	0.14 (0.08, 0.25)*	0.07 (0.02, 0.18)*
	No	1	1
HP told you to disclose	Yes	1.15 (0.72, 1.85)	1.27 (0.64, 2.52)
	No	1	1
Disclose to other than sexual partner	Yes	0.73 (0.44, 1.22)	0.60 (0.27, 1.30)
	No	1	1
Depression	Minimal	3.95 (2.42, 6.45)*	8.69 (3.62, 20.89)*
	No	1	1
Perceived stigma	Yes	1.15 (0.73, 1.83)	0.88 (0.41, 1.92)
	No	1	1

HP (Health Provider), COR (Crude Odds Ratio), AOR (Adjusted Odds Ratio); \*Significant (P < 0.05) in Bivariable and multivariable analysis

**Table 4:** Bivariable and multivariable regression of adult HIV positive people attending ART center in public health facilities of Dessie town, Ethiopia, 2022 (n = 458).

## Discussion

Factors that have a significant association with non-disclosure of HIV status to their sexual partner were serostatus of sexual partner, WHO clinical stage, social support, attending HIV counseling, and depression.

The odds of self-non-disclosure of HIV status to their sexual partner among patients whose partner was negative were lower as compared to those whose partner was positive. This finding is in line with a study conducted in Dire Dawa, Ethiopia [5]. In addition, there was a similar report from a study done in Iran [9]. The possible reason for this might be in order to prevent or protect their partner from HIV by taking care of themselves.

Patients who had WHO clinical stage one were 10.97 times more likely to non-disclosed their status to their sexual partner as compared to patients whose WHO clinical stage was three. Similarly, Patients who had WHO clinical stage two were 20 times more likely to non-disclose their status to their sexual partner as compared to patients those WHO clinical stage three. This finding is similar to studies conducted in North Shewa, Ethiopia, and Jimma Ethiopia [3,4]. The possible justification for this might be as the disease becomes severe and worth they become worried about their partner and obliged to disclose it. In addition, this could be due to the fact that clinical-stage one patients could not be experiencing physical symptoms as compared with clinical-stage four. Due to this reason, they may not be disclosed to sexual partners [3].

Patients who had social support from their family or friends had 16% less likely to non-disclosed their status to their sexual partner as compared to patients who had no social support. This result is in line with a study conducted in Addis Ababa, Ethiopia [6]. The possible reason for this might be patients who have social support will have a positive feeling about themselves and they will think they can live and perform their day-to-day activities as every other individual.

Patients who attend HIV counseling programs were 7% less likely to non-disclosed their status to their sexual partner as compared to those who did not attend HIV counseling programs. There is a similar finding from a systematic review and meta-analysis conducted in Ethiopia [7] and another study conducted in Butajira, Ethiopia [36]. In addition, a study conducted in USA

revealed the same result [37]. The possible justification for this may be receiving HIV counseling helps to improve psychological preparation, reduce stress, and inform the benefits of disclosure. During counseling interactions, there are dealing with painful emotional issues, expressing thoughts, and emotions, and feeling good about themselves and their behaviors. Furthermore, it improves their ability to accept HIV-positive results, increases their knowledge of the HIV disease process and medication, and reduces their fear of disclosing their HIV status. Receiving alternative information from health professionals assists in the development of self-confidence and self-esteem. As a result, those who received counseling were more likely to develop positive attitudes toward their HIV infection and disclose their status to a partner [7].

Patients who had minimal depression were 8.69 times more likely to non-disclosed their status to their sexual partner as compared to patients who had no depression. There is no study that had a significant association between depression and self-no-disclosure.

## Conclusions

Non-disclosure of HIV serostatus is a public health concern with serious implications for efforts toward HIV epidemic control. Factors that have a significant association with non-disclosure of HIV status to their sexual partner were serostatus of sexual partner, WHO clinical stage, social support, attending HIV counseling, and depression. Continuous emphasis should be given to health care providers to encourage their counseling services for their customers with special attention given to patients whose partners were HIV-negative and to work hard on their clients to decrease the occurrence of depression. In addition, health care providers should initiate their clients to bring their sexual partners to the service delivery area for counseling and testing. In addition, society should be motivated to give support to HIV-positive individuals in different social events and make them feel equal with other people. Community-based research is better to be conducted to address those patients who did not start HAART.

## Ethical Approval

The actual data collection was carried out after getting ethical approval from the Ethical review committee of Wollo University, College of Medicine and Health Sciences. In addition, the official



letter of cooperation was submitted to selected health facilities, and informed verbal consent was obtained from each respondent prior to enrollment. Each participant was informed about the aim and anyone who is not willing to participate in the study will not be enforced and had the full right to refuse or even withdraw from the study. They were also informed that all data obtained from them would be kept confidential by assigned codes instead of using their name and other personal identifiers and the information is used only for the purpose of the study.

Ethical clearance identification number for this study was CMHS-536/013/2012.

### Competing Interests

All the authors declared that they have no competing interest.

### Authors' Contributions

BA, BK and MY: Raised the research topic, wrote the proposal and collected the data; BA and BK analyzed the data and wrote the result; BA, BK, MY, and YD drafted the manuscript; YD, MY, MA, TA, KM and YW revised and edited the manuscript: All the authors read and approved the final manuscript.

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### Availability of Data and Materials

All the data used and analyzed during this study will be attached on reasonable request.

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### Supporting Information

S1 Table: STROBE 2007 (v4) Statement—Checklist of items that should be included in reports of observational studies.

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