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Review

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Disclosure of HIV seropositivity to sexual partner in Ethiopia: A systematic review

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Abstract

Introduction: In Ethiopia, the burden of HIV/AIDS is a public health issue that requires significant control of transmission. Once an infection has been established, determinants influence people living with HIV to disclose or not their HIV-positive status to sexual partners. This study assessed the proportion and associated factors of people living with HIV's disclosure status to sexual partners.

Methods: CRD42020149092 is the protocol's registration number in the PROSPERO database. We searched PubMed, Scopus, African Journals Online, and Google Scholar databases. For the subjective and objective assessment of publication bias, we used a funnel plot and Egger's regression test, respectively. The I^2 statistic was used to assess variation across studies. Meta-analysis of weighted inverse variance random-effects model was used to estimate the pooled proportion. We conducted subgroup and sensitivity analyses to investigate the cause of heterogeneity and the impact of outliers on the overall estimation, respectively. A trend analysis was also performed to show the presence of time variation.

Results: The percentage of people living with HIV who disclosed their HIV-positive status to sexual partners was 76.03% (95% confidence interval: 68.78, 83.27). Being on antiretroviral therapy (adjusted odds ratio = 6.19; 95% confidence interval: 2.92, 9.49), cohabiting with partner (adjusted odds ratio = 4.48; 95% confidence interval: 1.24, 7.72), receiving HIV counseling (adjusted odds ratio = 3.94; 95% confidence interval: 2.08, 5.80), having discussion prior to HIV testing (adjusted odds ratio = 4.40; 95% confidence interval: 2.11, 6.69), being aware of partner's HIV status (adjusted odds ratio = 6.08; 95% confidence interval: 3.05, 9.10), positive relationship with partner (adjusted odds ratio = 4.44; 95% confidence interval:1.28, 7.61), and being member of HIV association (adjusted odds ratio = 3.70; 95% confidence interval: 2.20, 5.20) had positive association with HIV status disclosure.

Conclusion: In Ethiopia, more than one-fourth of adults living with HIV did not disclose their HIV-positive status to sexual partners. HIV-positive status disclosure was influenced by psychosocial factors. A multidimensional approach is required to increase seropositive disclosure in Ethiopia.

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Keywords
disclosure, Ethiopia, HIV/AIDS, psychosocial factors, sexual partner

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Introduction

From 2015 baseline data, the United Nations' sustainable development goal aims to reduce the incidence of human immunodeficiency virus (HIV) infection.[1] Acquired immunodeficiency virus syndrome (AIDS) is the global burden disease with the majority of cases occurring in Sub-Sahara African countries. By 2018, nearly 37.9 million people worldwide were living with HIV/AIDS. Of these people, 25.7 million were in Sub-Sahara African countries.[2] By 2017, an estimated 722,248 Ethiopians were living with HIV.[3]

Universal HIV testing, safe sexual intercourse, having sex with only one partner, and the initiation of antiretroviral therapy (ART) all contribute to the prevention and control HIV epidemic transmission.[4–6] In addition to these, HIV status disclosure to a sexual partner is an important strategy for preventing HIV transmission to a second or third person.[7] Partners who disclosed their HIV status were more likely to adhere to ART, improve retention in care, and had lower viral-loads.[8,9] Disclosing HIV-positive status is important to get social and psychological support from their partners though negative outcomes sometimes happen as a result of stressful reactions.[10]

Individual perception and psychosocial processes may be influenced by psychological intervention and all of its components. The disclosure status of people living with HIV can be influenced by psychological process, modified behaviors and lifestyles.[11] Unable to disclose HIV-positive status to a sexual partner is one of the risky behaviors of HIV/AIDS patients.[12] Living in the same house with a sexual partner, social supports, and counseling help HIV-infected individuals to improve self-esteem and confidence, perception to have emotional support, social integration, mental well-being, aspects of the social environment with a positive connotation, and no fear of negative outcomes of disclosure as a result.[13] As a result, an HIV-infected person takes the initiative to disclose his or her HIV-positive status to their sexual partner. Furthermore, having witnessed someone publicly disclosing their HIV-positive status and receiving financial and nutritional assistance reduces the fear of stigma and discrimination, thereby improving HIV disclosure.[14–16] Fear of parental resentment, fear of stigma, lack of employment, social exclusion, perception of negative public opinion, fear of losing relationships or getting divorced, and being unaware of a spouse/sexual partner's HIV status were negatively affect HIV-positive disclosure status of people living with HIV as from a previous study.[17]

Disclosure is thought to be an ongoing social and psychological process of sharing critical health and personal information with others.[18] Despite numerous supportive interventions, only 58.7% of HIV-seropositive pregnant women in South Africa disclose to their sexual partners.[19] Similarly, 50.9% of HIV-positive Nigerians disclose their HIV status to their sexual partner;[20] 50.5% of seropositive adults in HIV support groups in Kenya[21] and 66% of HIV-positive women attending care and treatment clinics in Tanzania.[22]

Although several individual studies reported the proportion of HIV status disclosure to sexual partners in Ethiopia, there are no data as to the country level. Therefore, the purpose of this systematic review and meta-analysis was to estimate the proportion of people living with HIV who disclosed their HIV-positive status to sexual partners and to identify associated factors in Ethiopia.

Methods

Reporting

CRD42020149092 is the protocol's registration number in the PROSPERO database. This review is reported using the Preferred Reporting Items for Systematic Review and Meta-analysis guideline[23] (Supplementary file 1 in Supplemental material).

Search

We looked through PubMed, Scopus, African Journal Online, and Google Scholar databases. The authors also retrieved gray literature from Addis Ababa University's online research repository. The search terms and phrases were: HIV, Human immunodeficiency virus, AIDS, Acquired immunodeficiency syndrome, HIV/AIDS, HIV infection, HIV positive, HIV disclosure, reveal, expose, factors, predictors, determinant, reasons, Ethiopia.

To formulate the search string, we used AND/OR Boolean Operators. Search string applied for Scopus database was HIV OR human AND immunodeficiency AND virus OR AIDS OR acquired AND immunodeficiency AND syndrome AND disclosure OR reveal OR expose AND factors OR determinants OR risk AND factors OR associated AND factors AND of AND psychosocial AND factors OR predictors AND (LIMIT-TO (AFFILCOUNTRY, "Ethiopia")) AND (LIMIT-TO (LANGUAGE, "English")). PubMed search string was also ((HIV) OR Human immunodeficiency virus (MeSH Terms)) OR AIDS) OR Acquired

immunodeficiency syndrome) AND disclosure (MeSH Terms)) OR reveal (MeSH Terms)) OR expose (MeSH Terms)) AND factors) OR associated factors (MeSH Terms)) OR determinants (MeSH Terms)) OR risk factors (MeSH Terms)) OR psychosocial factors (MeSH Terms)) OR Predictors (MeSH Terms)) AND Ethiopia). The search was done from 1 October to 11 December 2019.

We used Endnote version x7 reference manager software to manage the articles collected through the searching process. After the first screening for duplications, the retrieved titles and abstracts were screened against the inclusion criteria. For studies that did not have the full-text results, we sent email text to the corresponding authors. For one published study with abstract only, we found the full-text unpublished format from Addis Ababa University research repository in Ethiopia.

Inclusion criteria

The articles included in this review were (1) primary studies that are done through either observational or interventional approach, (2) studies conducted among people living with HIV, (3) studies done in Ethiopia, and (4) studies conducted and/or published in the English language before 11 December 2019.

Population, intervention, comparison, and outcome (PICO)

The population considered was all HIV-positive adults who had sexual partners. Each variable included in primary studies was considered as exposure and comparison group. The outcome was HIV-positive disclosure status to their sexual partners. For the aim of this review, HIV disclosure is defined as the willingness of people to disclose seropositive status to their sexual partners.

Quality assessment

Articles were systematically appraised by using the Newcastle Ottawa quality assessment tool.[24] We evaluated the representativeness of the sample to the target population, adequacy of sample size, acceptability of response rate, reliability and validity of the tool, handling mechanism of confounding factors, outcome assessment mechanism, and appropriateness of statistical test. The third reviewer was involved to solve when disagreement between two reviewers arose. The average assessment score was 5.8.

Data extraction

Two of the authors extracted data independently using Microsoft Excel (version, 2010). The first author's name, year of publication, study setting, study design, study participants, sample size, reported proportion, adjusted odds ratio (AOR), and funding source were all extracted. For further analysis, the natural logarithm (LN), standard error, and uncertainty interval of proportion and AOR were calculated prior.

Data analysis

Extracted data were exported to STATA, version 14 for Windows (Stata Corp, 4905 Lake way Drive, College Station, Texas, USA) statistical software for analysis. To ensure the absence or presence of publication bias, we ran a funnel plot for subjective measurement and Sterne and Egger's[25] regression test for objective measurement. Variation across the studies was assessed using I^2 statistic with 25%, 50%, and 75% representing low, moderate, and high heterogeneity, respectively.[26] A weighted inverse variance random-effects model meta-analysis was carried out to estimate the pooled proportion.[27] We conducted subgroup and sensitivity analyses to investigate the cause of heterogeneity and outlier findings on the overall estimation, respectively.

Results

Search findings and study characteristics

The preliminary search yielded 1772 studies; from PubMed (n = 1,634), Scopus (n = 15), African Online Journals (n = 34), Google Scholar (n = 62), Addis Ababa University online research repository (n = 20), and by reviewing the reference lists of articles (n = 7). Finally, we found 18 studies that fulfilled the eligibility criteria for further quality assessment (Figure 1).

All of the included studies were cross-sectional. Even though the search was not limited to specific years, all studies we found were between 2012 and 2018. Three studies were conducted by the year 2012, two in 2016, and four in 2018. Only one study was done in each of the other years. The highest (91%) HIV-positive status disclosure to sexual partner was observed in 2017, with the lowest (57.4%) observed in 2015. While majority of studies (n = 12) included both men and women study participants,[28–39] the remaining studies (n = 6) included only women[40–45] (Table 1).

Publication bias and quality status

The p value for Egger's regression test was 0.870. Figure 2 shows the funnel plot distribution of original studies. We excluded one study[45] because it had a low quality status and a very small sample size for cross-sectional study design. The quality status of articles is shown in the Supplementary File 2 (Supplemental material).

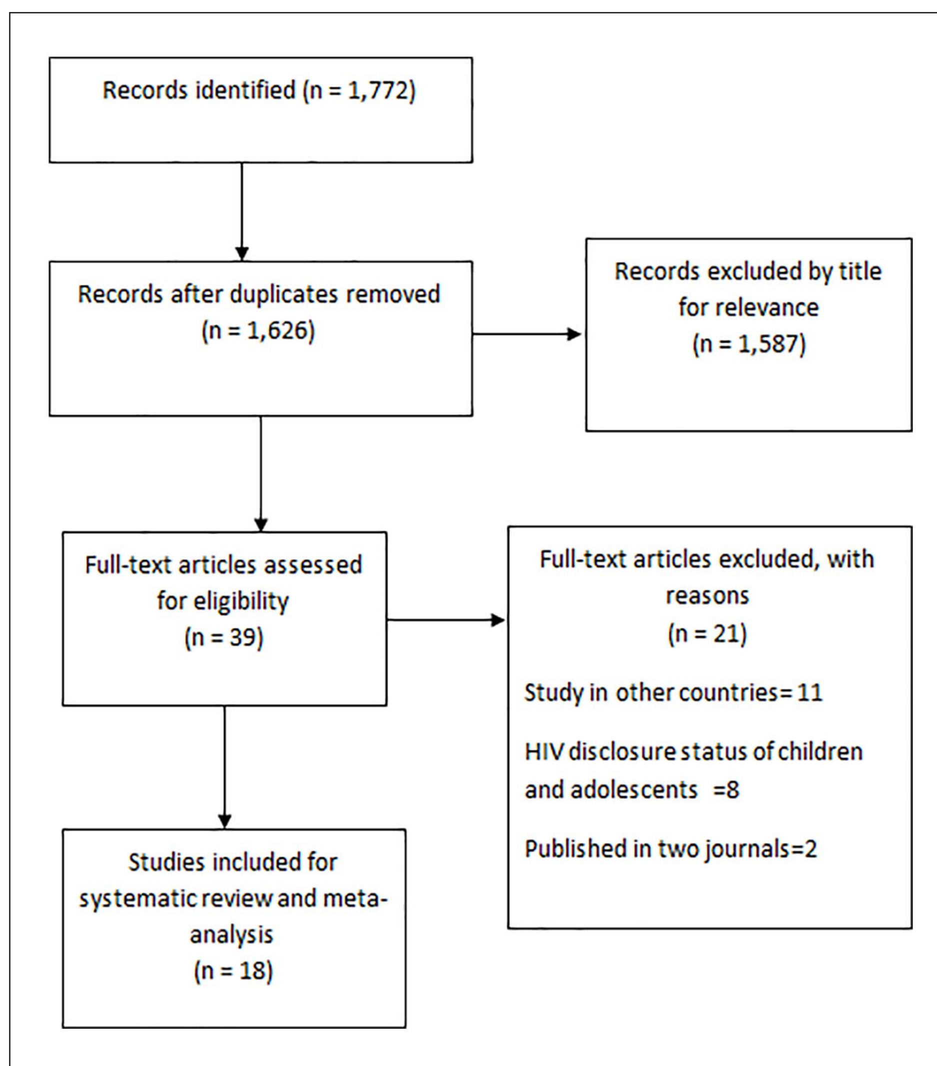

Figure 1. PRISMA flow chart displays the article selection process.

HIV-positive disclosure status

The smallest and largest sample size considered in the analysis was 107[41] and 1537,[38] respectively. Seventeen studies with a total of 8009 participants were included in the meta-analysis. The proportion of HIV-infected people who disclose their HIV-positive status to their sexual partner was 76.03% (95% confidence interval (CI): 68.78, 83.27) (Figure 3).

Subgroup analysis

According to the subgroup analysis, 75.70% of women and 76.16% of men who were infected with HIV disclosed their HIV-positive status to their sexual partners (Figure 4).

Sensitivity analysis

According to the sensitivity analysis, none of studies have significant change on the overall estimation (Table 2).

Trend analysis

The trend graph was formed by taking the year of publication in to account. The time course of HIV-status disclosure is depicted by the trend line (Figure 5).

Associated factors

Socio-demographic characteristics. According to a single-study report,[34] those study participants under the age of 39 were less likely (AOR = 0.014; 95% CI = 0.005, 0.037) to disclose their HIV status to sexual partner than those over the age of 39. Another study[35] revealed that people aged 40–44 (AOR = 0.52; 95% CI: 0.44, 0.61), 45 and older (AOR = 0.38; 95% CI: 0.22, 0.65) were less likely to disclose their HIV status to their sexual partner than people aged 25–29.

According to two studies, males (when females used as a reference, AOR = 3.039: 95% CI = 1.164, 7.935[34] and when males as reference, AOR = 0.25; 95% CI: 0.14,

Table 1. The characteristics of studies.

Ref.	Study area	Study participant	Sample size	Response rate (%)	Source of fund
Alemayehu et al.[40]	Mekelle, Northern Ethiopia	Women	315	100	Sheba University College, Ethiopia
Sendo et al.[41]	Addis Ababa, Central Ethiopia	Women	107	95.5	Alkan University college and NUFU/ GEMESO Research Project on HIV/AIDS
Erku et al.[28]	Woldia, Northern Ethiopia	Both sex	334	100	University of Gondar, Ethiopia
Deribe et al.[29]	Jimma, Southwest Ethiopia	Both sex	705	99.9	Netherlands Government Multi-Country Support Program on Social Science Research in the field of HIV/AIDS
Deribe et al.[42]	Hawassa, Southern Ethiopia	Women	207	100	Not mentioned
Dessalegn et al.[30]	Addis Ababa, Central Ethiopia	Both sex	676	100	Australian Department of Foreign Affairs and Trade and Western Sydney Sexual Health Clinic
Gari et al.[43]	Hawassa, Southern Ethiopia	Women	384	100	EPHA-CDC project
Geremew et al.[31]	Bale, Southern Ethiopia	Both sex	411	100	Not mentioned
Genet et al.[32]	Mekelle, Northen Ethiopia	Both sex	324	100	Not mentioned
Seid et al.[33]	Kemissie, Northen Ethiopia	Both sex	360	100	Not mentioned
Tesfaye et al.[34]	Jimma, Southwest Ethiopia	Both sex	351	98.1	Jimma University, Ethiopia
Gadisa et al.[35]	Six HIV clinic in Central Ethiopia	Both sex	1,180	100	National Institutes of Health and President's Emergency Plan for AIDS Relief
Kassaye et al.[45]	Gore and Mettu, Southern Ethiopia	Women	42	100	Menschen fur Menschen foundation IIRDP
Alema et al.[36]	Axum, Northen Ethiopia	Both Sex	361	99.7	Bahir Dar University
Kassahun et al.[44]	Jimma, Southwest Ethiopia	Women	337	99.7	Jimma University
Natae and Negawo[37]	West Shewa, Central Ethiopia	Both sex	420	99.5	Not mentioned
Reda et al.[38]	Eastern Ethiopia	Both sex	1537	98.4	Not mentioned
Koyira[39]	Addis Ababa, Central Ethiopia	Both sex	341	100	Ethiopia Public Health Association-Disease Control and Prevention

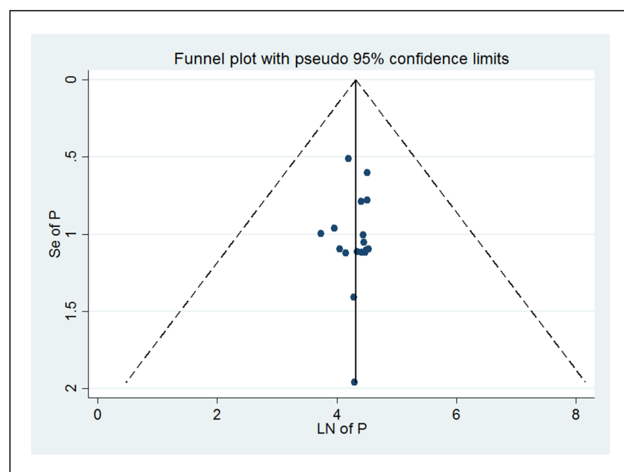

Figure 2. Funnel plot shows the symmetrical distribution of the prevalence of original studies; the x-axis shows the natural logarithm of prevalence (LN of P) and standard error of prevalence (Se of P) plotted on the Y-axis.

0.45[35]) were more likely than females to disclose their HIV status to their sexual partners.

As one study has shown, living in an urban area (AOR = 1.62; 95% CI = 1.0, 2.60)[31] was positively influence HIV-positive status disclosure.

One study[36] revealed a positive association between unmarried status (AOR = 3.71; 95% CI = 1.21, 11.39) and disclosure status, while another study[37] found a negative association (AOR = 0.12; 95% CI = 0.036–0.39). Those who had children (AOR = 9.89; 95% CI = 2.68, 36.36)[42] were more likely to disclose their HIV-positive status to sexual partners as reported from a single study.

Well-educated study participants (AOR = 0.4; 95% CI = 0.17–0.92)[28] and those completed secondary education (AOR = 0.6: 95% CI = 0.39, 0.92)[35] were less likely to disclose their HIV-positive status than uneducated people as evidenced each from one study. Those study participants who had took the position of control over household assets were less likely (AOR = 0.21; 95% CI = 0.12, 0.36)

First Author	P (95% CI)	% Weight
Alemayehu M et al	63.80 (61.60, 66.00)	5.88
Sendo EG et al	73.00 (69.16, 76.84)	5.82
Erku TA et al	76.70 (74.51, 78.89)	5.88
Deribe K et al	90.80 (89.27, 92.33)	5.90
Derbie B et al	72.90 (70.14, 75.66)	5.86
Dessalegn NG et al	82.50 (80.95, 84.05)	5.90
Gari T et al	85.70 (83.64, 87.76)	5.88
Geremew TD et al	52.60 (50.71, 54.49)	5.89
Genet M et al	57.40 (55.25, 59.55)	5.88
Seid M et al	93.10 (90.95, 95.25)	5.88
Tesfaye T et al	88.60 (86.43, 90.77)	5.88
Gadisa T et al	91.00 (89.82, 92.18)	5.90
Alema HB et al	41.80 (39.84, 43.76)	5.89
Kassahun G et al	83.00 (80.81, 85.19)	5.88
Natae et al	84.90 (82.93, 86.87)	5.89
Reda AA et al	66.30 (65.30, 67.30)	5.91
Koyira A	88.27 (86.07, 90.47)	5.88
Overall (I-squared = 99.6%, p <0.001)	76.03 (68.78, 83.27)	100.00

NOTE: Weights are from random effects analysis

0 75 100

Figure 3. Forest plot of the proportion (P) of HIV-positive people who disclosed HIV-positive status to their sexual partner and its 95% CI, the midpoint of each line illustrates the prevalence rate estimated in each study. The diamond shows the pooled prevalence.

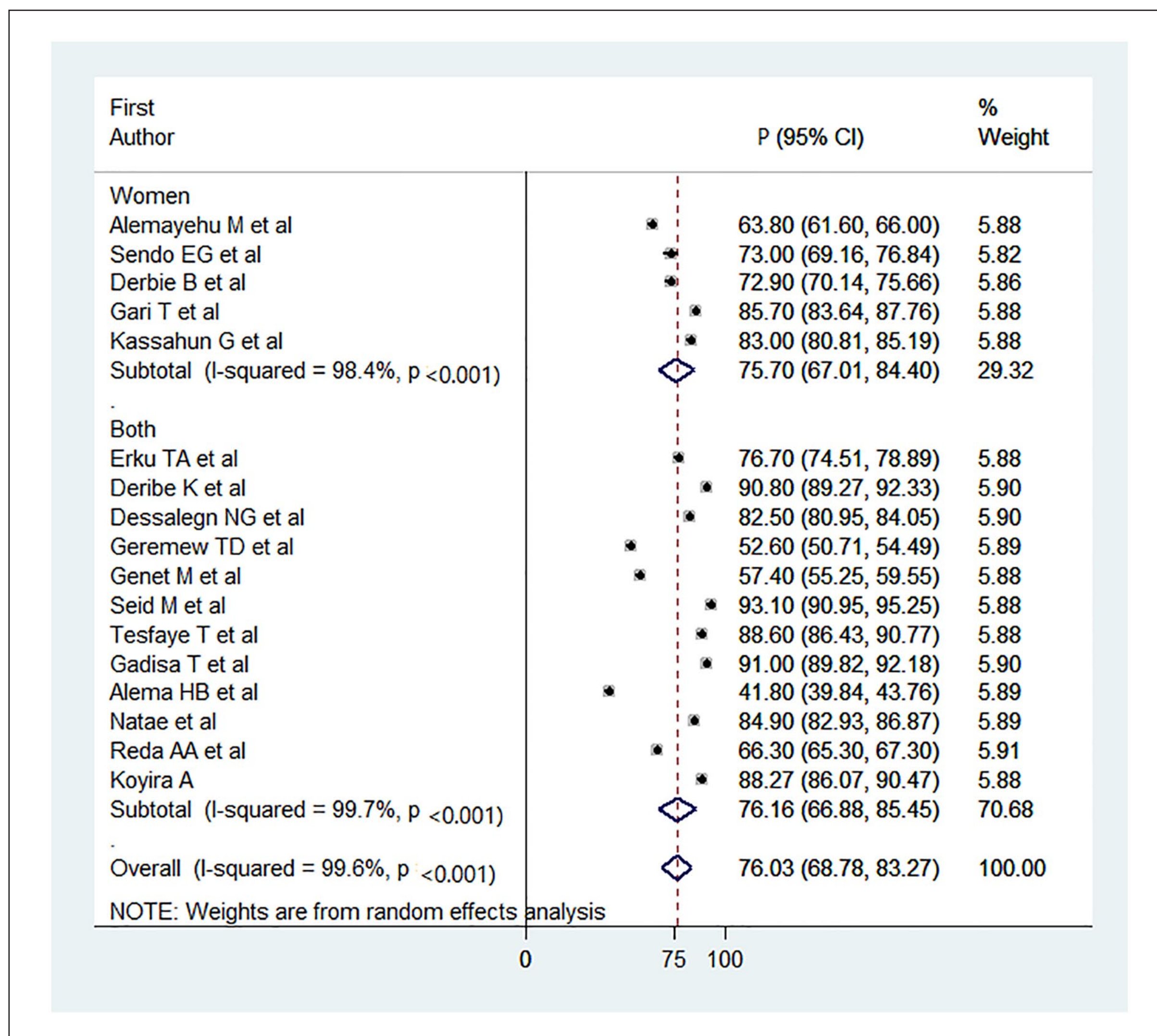

Figure 4. Subgroup analysis based on the study participant included in the original study.

to disclose their HIV-positive status when compared to their counterparts.[35]

Medical-related factors. The presence of comorbid medical illness (AOR = 2.5; 95% CI = 1.5, 4.2)[34] and having any clinical symptoms for HIV (AOR = 2.98; 95% CI = 1.72, 5.15)[34] were associated with a higher likelihood of disclosing HIV-positive status to a sexual partner. Non-disclosure status was associated with advanced stage HIV disease at the time of enrollment to care (AOR = 3.26; 95% CI = 1.76–6.04).[35] The other study[29] found that those who were on the WHO clinical stages I and II less likely (AOR = 0.22; 95% CI = 0.10–0.55) to disclose their HIV status. In contrast, another study found being on the WHO stage I and II were more likely (AOR = 2.77; 95% CI = 1.32–5.79) to disclose their HIV status.[34] The WHO stage is a clinical diagnosis of people living with HIV based on the list of clinical features.

The pooled effect of two studies[28,44] showed that being on ART was positively associated with HIV status disclosure (Table 3).

Psychosocial-related factors. Having open discussions about safer sex with partner,[44] using condoms always (AOR = 6.20; 95% CI = 2.52–15.25),[30] having greater social support (AOR = 2.98; 95% CI = 1.09, 8.14),[30] being the members of close-knit social groups (AOR = 2.78; 95% CI = 1.1, 6.7),[35] being peer counselor,[44] and low physical-domain-related quality of life (AOR = 3.83; 95% CI = 2.01, 7.32)[34] were more likely to disclose HIV status to their partner. Those who had high social-domain-related quality of life (AOR = 0.053, 95% CI = 0.022, 0.125)[34] and low negative self-image (AOR = 0.03; 95% CI = 0.04, 0.70)[29] were negatively affect people living with HIV to disclose HIV-positive status as showed each with single study. One of the categories of quality-of-life

dimensions is social well-being. Thus, social-domain-quality of life refers to "an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns."

Those who had a chance of seeing people living with HIV who disclose their HIV status to the community (AOR=2.1, 95% CI: 1.08, 4.01)[40] and knew other people living with HIV (AOR=4.76; 95% CI=2.63, 9.09)[35] were supportive factors to disclose HIV-positive status to sexual partners.

The pooled effects of cohabiting with partner, having a positive relationship with the partner, getting HIV counseling, having a prior discussion with a partner about HIV/AIDS and HIV testing, knowing partner's HIV status, and being a member of HIV association are illustrated on Table 3.

Table 2. The proportion (P) with 95% CI of HIV sero-disclosure practice to sexual partner when one study omitted from the analysis a step at a time.

Study emitted	Estimate	[93% Conf.]	Interval
Alemayehu et al.	76.789291	69.266319	84.312263
Sendo et al.	76.212303	68.692101	83. 732513
Erku et al.	75.98317	68.338295	83.628036
Deribe et al.	75.099609	67.615433	82. 583786
Derbie et al.	76.220047	68.647545	83.792549
Dessalegn et al.	75.619568	67.858932	83.380196
Gari et al.	75.420479	67.826332	83.014626
Geremew et al.	77.492012	70.396034	84.58799
Genet et al.	77.189674	69.826508	84.552849
Seid et al.	74.958412	67.524956	82.391869
Tesfaye et al.	75.239609	67.704475	82.774742
Gadisa et al.	75.086029	67.688049	82.484016
Alema et al.	78.168549	71.721474	84. 615623
Kassahun et al.	75.589554	67.977776	83.201332
Natae et al.	75.47023	67.851295	83.089172
Reda et al.	76.635452	68.866798	84.404099
Koyira	75.260345	67.720932	82. 799759
Combined	76.025496	68.780943	83.27005

Discussion

Although disclosing one's HIV-seropositive status to sexual partner can be frustrating, it has contributions on the HIV-prevention methods.[18] Evidence about HIV disclosure status to their sexual partner is critical to prevent HIV transmission in Ethiopia, which aims to end HIV epidemic by the end of 2030. This systematic review investigates HIV status disclosure and associated factors among people living with HIV in Ethiopia.

In the current meta-analysis, 76.03% of people living with HIV disclosed their HIV-positive status to sexual partner. This finding is higher than a study done in Tanzania (66%),[22] Togo (60.9%),[46] and Nigeria (50.4%),[47] and it is comparable to Uganda (81%)[48] and South Africa (80%).[49] On the other hand, the current meta-analysis result is lower than that of a Zimbabwean study (89.3%).[50] Despite the fact that all of these countries, including Ethiopia, are WHO-listed and follow WHO HIV guidelines, sociodemographic differences may contribute to this disparity.

In Ethiopia, the disclosure of HIV serostatus to sexual partners is decreasing over time. This could be due to a variety of factors, including a lack of public awareness of the seriousness of HIV on the multi-aspects of the country. This could be because Ethiopia is a developing

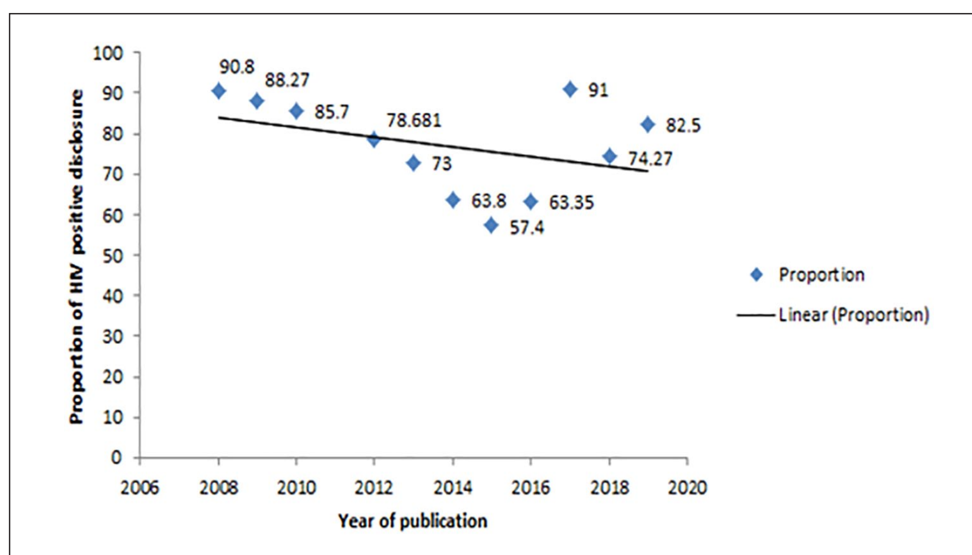

Figure 5. Trend analysis exhibits the proportion of HIV sero-disclosure practice from the year 2008–2019 in Ethiopia.

Table 3. List of variables with their pooled AOR (95% CI) and I-square percentage with its p value.

Variables	AOR (95% CI)	I-squared with p value
Being on ART[28,44]	6.19 (2.92, 9.49)	84.5%, 0.011
Cohabiting with partner[29,30]	4.48 (1.24, 7.72)	0.0%, 0.454
Getting counseling[28,31,40,42]	3.94 (2.08, 5.80)	23.9%, 0.268
Had discussion prior to HIV testing[29,32,37,40,41]	4.40 (2.11, 6.69)	0.0%, 0.972
Knowing partner's HIV status[28,30–32,36,37,40]	6.08 (3.05, 9.10)	27.3%, 0.220
Positive relationship with partner[30,34]	4.44 (1.28, 7.61)	0.0%, 0.616
Being member of HIV association[36,44]	3.70 (2.20, 5.20)	28.9%, 0.236

AOR: adjusted odds ratio; CI: confidence interval; ART: antiretroviral therapy; HIV: human immunodeficiency virus.

country with many health-related assets that rely on the support of non-governmental organizations. Because of the paradigm shift of developed countries from communicable disease to non-communicable disease, many HIV-related volunteer organizations are either phasing-out or shifting their thematic areas toward the emerging non-communicable chronic diseases. Similarly, while infectious diseases such as HIV are silently spreading in Ethiopia, the government's focus has shifted to non-communicable diseases, as it does in developed countries. Furthermore, there is no legal concern in Ethiopia about HIV disclosure status. In some other developed countries, however, disclosure of HIV-positive status is regarded as social and legal responsibility for people living with HIV. Since 1987, when the first prosecutions were initiated and HIV-specific criminal statutes enacted in the United States,[51] an increasing number of countries around the world have applied existing criminal laws and/or created HIV-specific criminal statutes to prosecute people living with HIV who are suspected of put others at risk of acquiring HIV.[52] People living with HIV who are stigmatized or discriminated against are less likely to disclose their HIV-positive status.

Based on this review, being on ART, cohabiting with partner, receiving HIV counseling, having discussion prior to HIV testing, being aware of partner's HIV status, having positive relationship with partner, and being member of HIV association were identified as determinants of HIV-positive status disclosure.

Being on ART increased the likelihood of disclosing HIV status to sexual partner. Evidence from Uganda support this finding.[16] One possible explanation is that starting ART is a step toward convincing the patient to live with HIV as a healthy individual. Moreover, as a result of receiving ART, their knowledge and attitude toward HIV prevention and treatment may improve so that they easily disclosed their status to sexual partner.

HIV infection has an impact on the physical, psychological, social, and spiritual well-being of people living with HIV and their partners.[53] Thinking about disclosing one's own HIV-positive status causes psychosocial conflict and problems. There are psychosocial issues that support disclosure experiences by stabilizing psychological well-being. Thus, cohabiting with a partner, having a positive relationship with the partner, receiving HIV counseling, having a discussion prior to HIV testing with a partner, knowing partner's HIV status, and being a member of HIV association were all considered psychosocial related factors of HIV-positive status disclosure practice. All these factors would help in the enhancement of problem-solving skills, lifestyle changes, assisting the patient in identifying choices, evaluating the value and consequences of alternatives, connecting the patient to spiritual and psychological support.

People who live with a partner were more likely to disclose their HIV status to sexual partners. Living together usually entails sexual activities and worries about HIV transmission. It also improves one's sense of well-being and helps in the development of empathy between couples. Moreover, this could be because the relationship is more trusting and the couple feels an intrinsic need for social support.[54]

In the HIV status disclosure process, the quality of partner's relationship may act as either a risk or a resilience factor.[55] Similarly, those who had positive relationships with their partners were more likely to disclose their HIV status to their sexual partner, according to this study. This could be because those who have a positive relationship with their partner are more likely to share a secret. If the relationship is positive, there will be less fear of stigma, violence, and separation, and thus, disclosure of HIV-positive status is more likely to happen. This evidence is supported by a study conducted in China found that disclosing HIV status to partners was significantly related to a better quality of relationships with partners as well as open and effective family communication.[56]

Counseling is essential for determining the presence of risky behavior, facilitating the expression of their concerns and worries, educating the patient on the risks of non-disclosure, bringing about behavioral change, and preventing and reducing psychological morbidity.[57] Besides, 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, emotions, and behaviors, feeling good about themselves, and achieving

specified desired results.[58] 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. Similarly, this review revealed that people living with HIV who had received counseling were more likely to disclose their HIV status to sexual partners. A study from Uganda also found the same attributes.[16]

HIV association working on HIV prevention is a group of people who share common beliefs and values that encourage HIV disclosure. The current meta-analysis revealed that those HIV-positive people who were members of HIV association were more likely to disclose their HIV-positive status to sexual partner. Being a member of HIV association helps to minimize negative myths and misinformation about HIV, promotes better interpersonal relationships, and develops a stronger sense of self and community that enables people living with HIV to receive emotional and functional support.[59] It further allows being members of a peer-support system that helps to mutually give and receive help from other, building on the key principles of respect, shared responsibility, and learn about healthy decision making. The effectiveness of this group comes from understanding another's situation and demonstrating empathy through shared experiences of emotional and psychological pain. Furthermore, it assists HIV-positive people in dealing with a wide range of concerns that come with their HIV-positive diagnosis, and they are important allies in the fight against stigma and discrimination, allowing them to easily disclose their HIV-positive status.

According to this review, people living with HIV who had a prior discussion about HIV and HIV testing were more likely to disclose their HIV status than their counterparts. This could be due to prior discussion with partner avoids the fear of negative reactions from parents, and the likelihood of accepting the positive result is higher if they have discussion prior to HIV testing. Furthermore, knowing partner's HIV status makes it easier to disclose their HIV status to sexual partner. This finding was supported by a study conducted in South Africa,[19] which found that disclosure was higher among pregnant women who knew their partner's HIV status.

Reaching the partners of people living with HIV is critical in achieving the goals of 90% of people know their HIV status and 90% of those knowing their status start ART that further to achieve zero HIV infection by the end of 2035. The findings of this meta-analysis will help governmental and non-governmental organizations to improve activities focused on HIV prevention and control in Ethiopia.

Strength and limitation

To the best of our knowledge, this is the first review that has pooled the national experiences and identified comprehensive determinants.

In terms of limitations, despite the fact that all of the studies were conducted in Ethiopia, used similar study design, a similar measurement tool, and performed subgroup analysis, the statistical heterogeneity value was high. In some cases, I^2 is not an absolute measure of heterogeneity; this heterogeneity may be due to the command we used ("Metan"). Because of the cross-sectional nature of the study, the associated factors may not have a cause-effect relationship as they do in interventional or follow-up studies. The search was restricted to the English language only. From Ethiopian Universities, we only searched Addis Ababa University's online repository library for gray literature.

Conclusion

In Ethiopia, still more than a quarter of people living with HIV adults did not disclose their HIV status to sexual partners. Being on ART, cohabiting with a partner, having a positive relationship with a partner, getting HIV counseling, having a discussion prior to HIV testing, knowing partner's HIV status, and being a member of an HIV association were all factors that fostered the disclosure of HIV-positive status. To further reduce the transmission rate of HIV in Ethiopia, behavioral changes to disclose seropositivity to sexual partner are urgently needed, with a focus on the country's health and education sectors.

Author contributions

AE conceived and designed the study. AE and DG established the search strategy. AE, BAD, HB, and TD wrote the draft manuscript. AE, YA, AB, WA, TD and RW revised the manuscript. All the authors read and approved the final manuscript.

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Supplemental material

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References

1. Bekker L-G, Alleyne G, Baral S, et al. Advancing global health and strengthening the HIV response in the era of the Sustainable Development Goals: the International AIDS Society-Lancet Commission. *Lancet* 2018; 392(10144): 312–358.
2. World Health Organization (WHO). HIV/AIDS data and statistics. Report, WHO, Geneva, 13 November 2019.
3. Ethiopian Public Health Institute (EPHI). *HIV related estimates and projections for Ethiopia–2017*. Addis Ababa: EPHI, 2017.
4. Jamison DT, Breman JG, Measham AR, et al. *Disease control priorities in developing countries*. Washington, DC: The World Bank, 2006.
5. Bunnell R, Mermin J and De Cock KM. HIV prevention for a threatened continent: implementing positive prevention in Africa. *JAMA* 2006; 296(7): 855–858.
6. Varghese B, Maher JE, Peterman TA, et al. Reducing the risk of sexual HIV transmission: quantifying the per-act risk for HIV on the basis of choice of partner, sex act, and condom use. *Sex Transm Dis* 2002; 29(1): 38–43.
7. O'Connell AA, Reed SJ and Serovich JA. The efficacy of serostatus disclosure for HIV transmission risk reduction. *AIDS Behav* 2015; 19(2): 283–290.
8. Dessie G, Wagnew F, Mulugeta H, et al. The effect of disclosure on adherence to antiretroviral therapy among adults living with HIV in Ethiopia: a systematic review and meta-analysis. *BMC Infect Dis* 2019; 19(1): 528.
9. Elopre L, Westfall A, Mugavero M, et al. (eds). *The role of HIV status disclosure in retention in care and viral-load suppression*. San Francisco, CA: Conference on Retroviruses and Opportunistic Infections (CROI) and International Antiviral Society–USA, 2015.
10. Atuyambe LM, Ssegujja E, Ssali S, et al. HIV/AIDS status disclosure increases support, behavioural change and, HIV prevention in the long term: a case for an Urban Clinic, Kampala, Uganda. *BMC Health Serv Res* 2014; 14(1): 276.
11. Chaudoir SR and Fisher JD. The disclosure processes model: understanding disclosure decision-making and post-disclosure outcomes among people living with a concealable stigmatized identity. *Psychol Bull* 2010; 136(2): 236–256.
12. Gerbi GB, Habtemariam T, Robnett V, et al. Psychosocial factors as predictors of HIV/AIDS risky behaviors among people living with HIV/AIDS. *J AIDS HIV Res* 2012; 4(1): 8–16.
13. Marmot MG. Improvement of social environment to improve health. *Lancet* 1998; 351(9095): 57–60.
14. World Health Organization (WHO). Statement on HIV testing and counseling: WHO, UNAIDS re-affirm opposition to mandatory HIV testing, https://www.who.int/hiv/events/2012/world_aids_day/hiv_testing_counselling/en/
15. Obermeyer CM, Baijal P and Pegurri E. Facilitating HIV disclosure across diverse settings: a review. *Am J Public Health* 2011; 101(6): 1011–1023.
16. Kadowa I and Nuwaha F. Factors influencing disclosure of HIV positive status in Mityana district of Uganda. *Afr Health Sci* 2009; 9(1): 26–33.
17. Oseni OE, Okafor IP and Sekoni AO. Issues surrounding HIV status disclosure: experiences of seropositive women in Lagos, Nigeria. *Int J Prev Med* 2017; 8: 60.
18. Mayfield Arnold E, Rice E, Flannery D, et al. HIV disclosure among adults living with HIV. *AIDS Care* 2008; 20(1): 80–92.
19. Ramlagan S, Matseke G, Rodriguez VJ, et al. Determinants of disclosure and non-disclosure of HIV-positive status, by pregnant women in rural South Africa. *SAHARA J* 2018; 15(1): 155–163.
20. Amoran OE. Predictors of disclosure of sero-status to sexual partners among people living with HIV/AIDS in Ogun State, Nigeria. *Niger J Clin Pract* 2012; 15(4): 385–390.
21. Ndayala P, Ondigi AN and Ngige L. Nature and extent of HIV self disclosure by seropositive adults in HIV support groups in Nairobi County, Kenya. *Res Humanit Soc Sci* 2015; 5: 87–97.
22. Damian DJ, Ngahatilwa D, Fadhili H, et al. Factors associated with HIV status disclosure to partners and its outcomes among HIV-positive women attending Care and Treatment Clinics at Kilimanjaro region, Tanzania. *PLoS One* 2019; 14(3): e0211921.
23. Moher D, Liberati A, Tetzlaff J, et al.; PRISMA Group. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *BMJ* 2009; 339: b2535.
24. Stang A. Critical evaluation of the Newcastle-Ottawa scale for the assessment of the quality of nonrandomized studies in meta-analyses. *Eur J Epidemiol* 2010; 25(9): 603–605.
25. Sterne JA and Egger M. Regression methods to detect publication and other bias in meta-analysis. In: Rothstein HR, Sutton AJ and Borenstein M (eds) *Publication bias in meta-analysis: prevention, assessment and adjustments*. Hoboken, NJ: Wiley, 2005, pp. 99–110.
26. Higgins JP, Thompson SG, Deeks JJ, et al. Measuring inconsistency in meta-analyses. *BMJ* 2003; 327(7414): 557–560.
27. DerSimonian R and Kacker R. Random-effects model for meta-analysis of clinical trials: an update. *Contemp Clin Trials* 2007; 28(2): 105–114.
28. Erku TA, Megabiaw B and Wubshet M. Predictors of HIV status disclosure to sexual partners among people living with HIV/AIDS in Ethiopia. *Pan Afr Med J* 2012; 13: 87.
29. Deribe K, Woldemichael K, Wondafrash M, et al. Disclosure experience and associated factors among HIV positive men and women clinical service users in southwest Ethiopia. *BMC Public Health* 2008; 8(1): 81.
30. Dessalegn NG, Hailemichael RG, Shewa-Amare A, et al. HIV disclosure: HIV-positive status disclosure to sexual partners among individuals receiving HIV care in Addis Ababa, Ethiopia. *PLoS One* 2019; 14(2): e0211967.
31. Geremew TD, Nuri RA and Esmael JK. Sero status disclosure to sexual partner and associated factors among adult HIV positive patients in Bale Zone Hospitals, Oromia Region, Ethiopia: institution based cross-sectional study. *Open J Epidemiol* 2018; 8(2): 43–53.
32. Genet M, Sebsibie G and Gultie T. Disclosure of HIV seropositive status to sexual partners and its associated factors

among patients attending antiretroviral treatment clinic follow up at Mekelle Hospital, Ethiopia: a cross sectional study. *BMC Res Notes* 2015; 8(1): 109.
33. Seid M, Wasie B and Admassu M. Disclosure of HIV positive result to a sexual partner among adult clinical service users in Kemissie district, northeast Ethiopia. *Afr J Reprod Health* 2012; 16(1): 97–104.
34. Tesfaye T, Darega J, Belachew T, et al. HIV positive serostatus disclosure and its determinants among people living with HIV/AIDS following ART clinic in Jimma University Specialized Hospital, Southwest Ethiopia: a facility- based cross-sectional study. *Arch Public Health* 2018; 76(1): 1.
35. Gadisa T, Tymejczyk O, Kulkarni SG, et al. Disclosure history among persons initiating antiretroviral treatment at six HIV clinics in Oromia, Ethiopia, 2012–2013. *AIDS Behav* 2017; 21(1): 70–81.
36. Alema HB, Misgina KH and Weldu MG. Determinant factors of HIV positive status disclosure among adults in Axum Health Facilities, Northern Ethiopia: implication on treatment adherence. *J AIDS HIV Res* 2017; 9(3): 52–59.
37. Natae S and Negawo M. Factors affecting HIV positive status disclosure among people living with HIV in West Showa Zone, Oromia, Ethiopia; 2013. *Abnorm Behav Psychol* 2016; 2(2): 114.
38. Reda AA, Biadgilign S, Deribe K, et al. HIV-positive status disclosure among men and women receiving antiretroviral treatment in eastern Ethiopia. *AIDS Care* 2013; 25(8): 956–960.
39. Koyira A. Assessment of magnitude, barriers and outcomes related with HIV serostatus disclosure among ART users, in Addis Ababa ART providing health facilities, 2009, http://213.55.95.56/handle/123456789/3467
40. Alemayehu M, Aregay A, Kalayu A, et al. HIV disclosure to sexual partner and associated factors among women attending ART clinic at Mekelle hospital, Northern Ethiopia. *BMC Public Health* 2014; 14(1): 746.
41. Sendo EG, Cherie A and Erku TA. Disclosure experience to partner and its effect on intention to utilize prevention of mother to child transmission service among HIV positive pregnant women attending antenatal care in Addis Ababa, Ethiopia. *BMC Public Health* 2013; 13(1): 765.
42. Deribe B, Ebrahim J and Bush L. Outcomes and factors affecting HIV status disclosure to regular sexual partner among women attending antiretroviral treatment clinic. *J AIDS Clin Res* 2018; 9(3): 760.
43. Gari T, Habte D and Markos E. HIV positive status disclosure among women attending art clinic at Hawassa University Referral Hospital, South Ethiopia. *East Afr J Public Health* 2010; 7(1): 87–91.
44. Kassahun G, Tenaw Z, Belachew T, et al. Determinants and status of HIV disclosure among reproductive age women on antiretroviral therapy at three health facilities in Jimma Town, Ethiopia, 2017. *Health Sci J* 2018; 12(2): 558.
45. Kassaye KD, Lingerh W and Dejene Y. Determinants and outcomes of disclosing HIV-sero positive status to sexual partners among women in Mettu and Gore towns, Illubabor Zone southwest Ethiopia. *Ethiop J Health Dev* 2005; 19(2): 126–131.
46. Yaya I, Saka B, Landoh DE, et al. HIV status disclosure to sexual partners, among people living with HIV and AIDS on antiretroviral therapy at Sokodé regional hospital, Togo. *PLoS One* 2015; 10(2): e0118157.
47. Martins OF, Ngong HC, Dongs IS, et al. Rates, factors, timing and outcomes of HIV status disclosure among patients attending the special treatment clinic of the National Hospital Abuja Nigeria. *Int J HIV/AIDS Prev Educ Behav Sci* 2016; 2(3): 13–19.
48. Okello ES, Wagner GJ, Ghosh-Dastidar B, et al. Depression, internalized HIV stigma and HIV disclosure. *World J AIDS* 2015; 5(1): 30–40.
49. Vu L, Andrinopoulos K, Mathews C, et al. Disclosure of HIV status to sex partners among HIV-infected men and women in Cape Town, South Africa. *AIDS Behav* 2012; 16(1): 132–138.
50. Shamu SZC, Zarowsky C, Shefer T, et al. Intimate partner violence after disclosure of HIV test results among pregnant women in Harare, Zimbabwe. *PLoS One* 2014; 9(10): e109447.
51. Office of the United Nations High Commissioner for Human Rights and the Joint United Nations Programme on HIV/AIDS. *International guidelines on HIV/AIDS and human rights*. Geneva: Office of the United Nations High Commissioner for Human Rights and the Joint United Nations Programme on HIV/AIDS, 2006.
52. Glendon MA. The rule of law in the Universal Declaration of Human Rights. *NW J Int Hum Rights* 2004; 2: 5.
53. Stutterheim SE, Bos AE, Pryor JB, et al. Psychological and social correlates of HIV status disclosure: the significance of stigma visibility. *AIDS Educ Prev* 2011; 23(4): 382–392.
54. Calin T, Green J, Hetherton J, et al. Disclosure of HIV among black African men and women attending a London HIV clinic. *AIDS Care* 2007; 19(3): 385–391.
55. Smith C, Cook R and Rohleder P. Taking into account the quality of the relationship in HIV disclosure. *AIDS Behav* 2017; 21(1): 106–117.
56. Qiao S, Li X, Zhou Y, et al. AIDS impact special issue 2015: interpersonal factors associated with HIV partner disclosure among HIV-infected people in China. *AIDS Care* 2016; 28(suppl. 1): 37–43.
57. Chippindale S and French L. HIV counselling and the psychosocial management of patients with HIV or AIDS. *BMJ* 2001; 322(7301): 1533–1535.
58. Green J, McCreaner A and Green J. *Counselling in HIV infection and AIDS*. Oxford: Blackwell Science, 1996.
59. Molassiotis A, Callaghan P, Twinn S, et al. A pilot study of the effects of cognitive-behavioral group therapy and peer support/counseling in decreasing psychologic distress and improving quality of life in Chinese patients with symptomatic HIV disease. *AIDS Patient Care STDS* 2002; 16(2): 83–96.