

# Prevalence of Unrecognized Depression and Associated Factors Among Newly Diagnosed People Living with HIV/AIDS in West Shoa Zone, Ethiopia 2019, Cross-Sectional Study

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## Primary research

**Keywords:** Depression, HIV/AIDS Perceived stress, Ethiopia, Prevalence, west shoa zone, Central Ethiopia

**Posted Date:** September 8th, 2020

**DOI:** <https://doi.org/10.21203/rs.3.rs-71562/v1>

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# Abstract

**Background:** Clinical depression has been associated with various chronic disease conditions. The chronic course of HIV, fostered by the use of antiretroviral therapy in infected patients, puts them at risk of developing clinical depression which unfortunately, is often undiagnosed and therefore untreated. This study aimed to assess Prevalence of unrecognized depression and associated factors among newly diagnosed people living with HIV/AIDS in west shoa zone, oromia regional state, central Ethiopia.

**Method:** Institutional-based cross-sectional study was implemented in 2019. A total of 429 newly diagnosed HIV-positive patients who had regular visit at selected public health facilities in west shoa zone, oromia regional state, central Ethiopia were included in the study. Systematic random sampling technique was used to recruit study participants. Patient Health Questionnaire item nine (PHQ-9) was used to assess depressive symptoms. In addition to this, HIV perceived stress scale was used to assess HIV-related perceived stress.

**Result:** A total of 429 study participants were included in the study, giving a response rate of 100%. The mean age of the respondents was 37 years (SD  $\pm$  10.04). This study revealed that 47.3% of HIV-positive patients had depression. Patients who had opportunity infection [AOR = 2.15, (95% CI 1.41, 3.29)], HIV-related perceived stress [AOR = 2.23, (95% CI 1.44, 3.46)] and CD4 cell count < 200 [AOR = 1.94, (95% CI 1.25, 3.02)] were more likely to have depression as compared to individuals who had no opportunity infection, no perceived HIV stress and CD4 cell count > 200, respectively.

**Conclusion and recommendation:** Having HIV-related perceived stress and opportunity infection of participant had statistically significant association with undiagnosed depressive. Training of health workers in ART clinics and availing manuals on assessing mental health issues is useful to screen and treat depression among HIV patients.

## Background

Depression also known as major depressive disorder or clinical depression is a common mental health disorder that results in persistent sadness and loss of interest in activities previously enjoyed, for a period of at least 2 weeks [1]. It is commonly present as co morbidity in many chronic illnesses adding to the overall burden of disease [2]. One of such chronic illnesses is disease caused by infection with the human immunodeficiency virus (HIV) which has become a global pandemic with close to 36.9 million people living with the disease worldwide by the end of 2017, and 1 million deaths from the disease in the same year [3].

Depression is one of the most common mental disorders people with HIV/AIDS experience and negatively affects adherence to and outcomes of antiretroviral treatment (ART) [4–5]. Throughout the course of HIV infection, patients may experience depressive symptoms due to deteriorated health status, difficulty functioning, ART side effects, apathy, perceived stress stigma, and discrimination [6–7].

Studies conducted in different countries on prevalence of depression among HIV patients showed 25.6% in united state US [8], 42.3% in Brazil [9], 40.9% in china [10], 12% in Malawi [11], 31% in Nigeria [12], 33% in eastern Nigeria [13], 58.75% Delhi (India) [14], 26.7% in Cameroon[15], 63% in Cameroon [16] 63.1% in Khartoum Sudan[17], 48.6% in Hawassa, Ethiopia[18], 45.8% in Gurage zone, Ethiopia[19],37.5% in Addis Ababa, Ethiopia [20], 45.8% in Harar, Ethiopia [21],41.7% in Gimbi general hospital [22].

In different studies so far, sex, having co morbid TB illness, perceived HIV stigma, poor social support, HIV stage III, and poor medication adherence and CD4 cell count(< 200) were found significantly associated with depression. But site specific evidence is needed to identify factors associated with depression among adult patients with HIV/AIDS on ART [18, 23, 24, 25 and 26]. More over it is crucial to identify patients with undiagnosed depression for proper management of the disease. Thus, this research was aimed at providing data on the prevalence and factors associated with undiagnosed depression among newly diagnosed people living with HIV/AIDS.

## **Method**

### **Study design and setting**

An institutional-based cross-sectional study was employed. The study was conducted in the West Shoa zone, Oromia regional state, Ethiopia. In west Shoa zone there are eight public hospitals and ninety one health center. From those all hospital and twenty four health center have ART clinic. From this public health there are around 12272 ARV patients on follow up. The assessment was conducted from February 1, to April 30, 2020.

### **Sample size estimation and recruitment of participants**

Single population proportion formula was used to calculate the sample size using the magnitude of depression in pregnant mothers in Ethiopia, 37.5% [20], with a 95% confidence interval, 5% of margin error and with the calculated design effect of 2.5. A multi-stage sampling technique was used to select the study participants. Initially, three hospitals and ten health centers was selected by simple random sampling from a total of eight hospital and 24 health centers in West shoa zone which have ART clinic. Then three hospitals and ten health centers was selected proportionally by lottery method. Then total sample size was allocated proportionally to each selected public health institutions based on the number of target population. A total of 429 newly diagnosed PLWHIV on follow up at least for six month were recruited for the study. Those with hearing or cognitive impairment to the extent of impairing capacity to communicate adequately and unable to give informed consent to take part in the study were excluded from the study.

### **Data collection instrument and data collectors**

Data were collected by trained data collectors. The presence of antenatal depression was assessed by the Patient Health Questionnaire item nine (PHQ-9). The prevalence of depressive symptoms, defined by

PHQ-9 scale, this study a positive depression screen was defined as a PHQ-9 score greater than 9, among newly-diagnosed HIV-infected subjects during initial assessment [30]. We have used tools consisted of structured and standardized locally translated language psychosocial assessment instruments, most of which have previously been used among persons living with HIV (PLWHIV) in Ethiopia by this study group [29].

## **Data analysis**

The Statistical Package for Social Science (SPSS) version 21.0 was used for data analysis. Newly diagnosed PLWHIV on follow up socio-demographic, economic and clinical related characteristics were described using the statistics of frequency and percentage distributions. Further, bivariate logistic regression analysis was conducted to identify correlates of HIV/ AIDS depression. Variables with a p-value < 0.25 during bivariate analysis were entered into a multivariate logistic regression analysis to identify potential confounders. Then, adjusted OR was calculated using multivariate logistic regression analysis and the level of significance of association was determined. Significance level was declared at < 0.05.

## **Results**

### **Socio- demographic characteristics of respondents**

A total of 429 PLWHIV were included in the study yielding a response rate of 100%. The mean age ( $\pm$  SD) of the PLWHIV was  $37.68 \pm 10.04$  years, with ages ranging between 19 and 65 years. Out of 429 PLWHIV, 356 (83%) were from the Oromo ethnic group, 183(42.7%) had primary school education and 249 (58%) were married (Table 1).

### **Clinical related characteristics**

Regarding the clinical related characteristics 179 (41.7%) of the PLWHIV had Past opportunistic infection, 173 (40.3%) of PLWHIV their spouse had history of Chronic illness , 286(66.7%) their Cd4 cell counts was greater 200 and 235 (54.8%) had a history of HIV/AIDS related perceived stress (Table 2).

### **Prevalence and factors associated with newly diagnosed HIV/AIDS depression**

The prevalence of undiagnosed depression among newly diagnosed HIV/AIDS patients was 47.3%. The following variables were not significantly associated with newly diagnosed HIV/AIDS depression in the bivariate analysis: age, ethnic group, religion, marital status, educational status, occupational status, monthly family income, religion supportive care, TB test, TB treatment history and HIV sero status disclosure of respondents. However, residence, weight, health condition of spouse, CD4 cell counts and HIV related perceived stress were statistically associated with depression in the bivariate analysis. In the multivariable analysis, the study participants who had opportunity infection [AOR = 2.15 (1.41, 3.29)] were 2.15times more likely to develop depression as compared to had no opportunity infection.

Patients who had perceived HIV/AIDS stress [AOR = 2.23, 95% CI (1.33, 3.46)] were 2.2 times more likely to be depressed as compared to those who had not. The probability of occurring depression was 2 times higher among participant who were CD4  $\leq$ 200 cell counts when compared to CD4 >200 cell counts [AOR= 1.94, 95% CI (1.25, 3.02)] (table 3).

## Discussion

In this study, the prevalence of undiagnosed depression among adult newly diagnosed HIV/AIDS patients on ART was 47.3%, which is in line with a study conducted in Hawassa University Comprehensive specialized hospital Ethiopia (48.6%) [18], 45.8% in Harar [21], in Alert Hospital Addis Ababa, Ethiopia 41.2% [20], in Gimbi general hospital 41.7% [22]. But it is relatively low as compared to 63.1% in Khartoum Sudan [17], in Cameroon 63% [16] and Delhi (India) 58.75% [14], on the other hand it is relatively higher than in Cameroon 26.7%, in Nigeria 23.4% [13] in China 40.9% [10], in Brazil 42.3% [9], in gurage zone Ethiopia 37.5% [19]. The difference might be related to study design, data collection tool, sample size and study participant's variation.

Clients who had perceived HIV/AIDS stress were 2.2 times more likely to have depressive symptom when compared to clients who had had perceived HIV/AIDS stress [AOR = 2.23, 95% CI (1.33, 3.46)]. The justification might be due to the fact that those who isolated themselves from others lead to worsening the depression.

In this study, we found a positive correlation between HIV/AIDS related perceived stress and depression. Su et al. found that perceived stress was associated with depression and perceived stress mediates the relationship between perceived discrimination and depression [27].

Furthermore, it can increase the psychological stress of patients and the risk of having depression. It was estimated that there are approximately about 550,000 MLWHA in China in 2011 [28]. Therefore, perceived stress is a psychological burden that may be associated with the occurrence of depression, and the elimination of discrimination requires active interventions at different levels.

Individuals who had  $\leq$  200 CD4 cell count had significant association with undiagnosed depression. This was similar to the study conducted in Hawassa University Compressive Specialized hospital Ethiopia [18], and Nigeria [25]. This might be due to severe immune depression and HIV illness is underlining causes of depression

The finding of this study also showed that those who had history of opportunistic infection were more likely to develop depression. This might be due to the fact that opportunistic infection may lead to dissatisfaction with one's physical appearance, which might be a reason for the occurrence of depression. This finding is consistent with study done in Gimbi general hospital [22].

## Conclusion

Undiagnosed depression was high (47.3%) among the current study population. Perceived HIV-related stress, had opportunity infection and CD4 count (< 200) had significant association with depression. Hence, depression is highly prevalent among newly diagnosed HIV-positive patients, still under diagnosed and undertreated but it needs further research. Therefore, Ministry of Health should give more emphasis to those clients with depression. Further research on effect of depression should be conducted to strengthen and broaden the current findings.

## **Declarations**

### **Acknowledgements**

The authors express their deep appreciation to the college of medicine and health science of ethics committee of the Ambo University, as well as the West Shoa zone health bureau ethical committee for allowing this study to be conducted in the selected public health facilities. The authors would also like to acknowledge all the data collectors and supervisors as well as the study participants for their participation.

### **Authors' contributions**

TT conceived the study and was involved in the study design, reviewed the article, analysis, report writing and drafted the manuscript. TL, ET and MG were involved in the study design and analysis. All authors read and approved the final manuscript

### **Funding**

This study was funded by the Ambo University, Research and community service core process. The funder had no role in study design, data collection, analysis and decision to publish.

### **Availability of data and materials**

The dataset pertaining to this study will be shared upon reasonable request.

### **Ethics approval and consent to participate**

Before data collection, ethical clearance letter was obtained from the ethical clearance committee of Ambo University, college of medicine and health sciences. Formal letter of permission was obtained from the selected public health facilities. Finally, oral and written informed consent was requested from the study participant after clearly explaining the objectives of the study. The participants were also informed that they may withdraw themselves at any stage of the data collection period.

### **Consent for publication**

Not applicable.

## Competing interest

The authors declare that they have no competing interests

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## Tables

Table 1  
Socio-demographic characteristics of newly diagnosed PLWHIV on  
ART (n = 429) on follow up at health facilities in West Shoa zone,  
Oromia Region Ethiopia, 2020

<b>Variables</b>	<b>frequency</b>	<b>Percentage</b>
Age of respondents		
Less than 30	125	29.1
Greater or equal 30	304	70.9
Total	429	100.0
Sex of respondents		
Male	235	54.8
Female	194	45.2
Total	429	100.0
Ethnicity of respondents		
Oromo	356	83.0
Amhara	49	11.4
Others	24	5.6
Religion of respondents		
Orthodox Christian	211	49.2
Protestant Christian	153	35.7
Muslim	35	8.2
Waqeffataa	30	7.0
Total	429	100.0
Educational status of respondents		
No formal education	124	28.9
Primary school	183	42.7
Secondary school	66	15.4
Higher educated	56	13.1
Total	429	100.0
Occupational status of respondents		
Gov't employee	59	13.8

<b>Variables</b>	<b>frequency</b>	<b>Percentage</b>
Merchant	104	24.2
farmer	99	23.1
student	50	11.7
Daily worker	48	11.2
others	69	16.1
total	429	100.0
Marital status of respondents		
Single	66	15.4
Married	249	58
Divorced	52	12.1
widowed	24	5.6
Separated	38	8.9
Total	429	100.0
Dependent child at home		
yes	327	76.2
No	102	23.8
Total	429	100.0
Family monthly income of respondents		
Less or equal 500	134	31.2
501 up to 900	81	18.9
901 up to 2000	173	33.3
Equal or greater than 2000	71	16.6
Total	429	100.0
Residence of respondents		
Urban	292	68.1
Rural	137	31.9
Total	429	100.0

Table 2  
clinical related factors of newly diagnosed PLWHIV on ART follow up (n = 429) on follow up at health facilities in West Shoa zone, Oromia Region Ethiopia, 2020

<b>Variables</b>	<b>Frequency</b>	<b>Percentage</b>
Past opportunistic infection		
Yes	179	41.7
No	250	58.3
History past TB test		
Yes	368	85.8
No	61	14.2
Total	429	100.0
Past TB treatment history		
Yes	97	22.6
No	332	77.4
CD4 cell counts		
CD4 > 200	286	66.7
CD4 ≤ 200	143	33.3
Weight of respondents during data collection	429	100.0
Less than 50 kg	176	41.0
Greater than or equal 50 kg	253	59.0
Total	429	100.0
Having religion supportive care		
Yes	188	43.8
No	241	56.2
Total	429	100.0
HIV sero status disclosure		
Yes	347	80.9
No	82	19.1
Total	429	100
Health condition of husband or wife		

<b>Variables</b>	<b>Frequency</b>	<b>Percentage</b>
Health	141	32.9
Chronic	173	40.3
Dead	68	15.9
Unknown	47	11.0
Total	429	100.0
HIV related Perceived stress scale		
Presence	235	54.8
Absence	194	45.2

Table 3

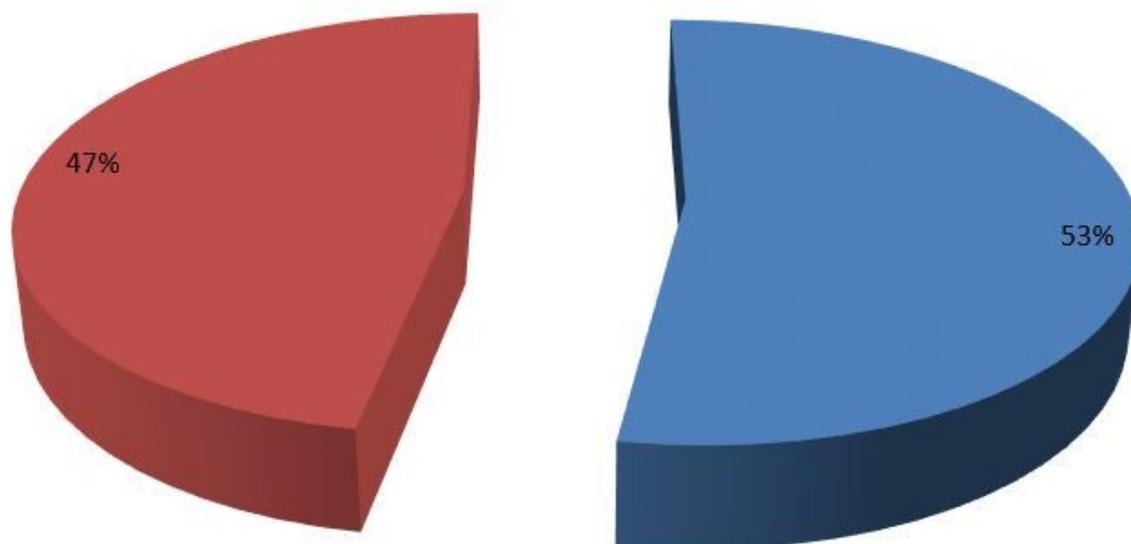
factors associated with undiagnosed depression among PLWHIV on ART follow up (n = 429) on follow up at health facilities in West Shoa zone, Oromia Region Ethiopia, 2020

Variables	Depression		COR(95%CI)	AOR(95%CI)
	presence	Absence		
Sex of respondents				
Male	95	140	1.00	1.00
Female	108	86	<b>1.85(1.23,2.72)</b>	1.48(0.98,2.23)
Residence				
Urban	149	143	<b>1.60(1.06,2.43)</b>	<b>1.70(1.10,2.61)**</b>
Rural	54	83	1.00	1.00
Past opportunistic infection				
Yes	98	81	<b>1.67(1.14,2.46)</b>	<b>2.15(1.41,3.29)**</b>
No	105	145	1.00	1.00
Weight of respondents during data collection				
CD 4 cell count				
CD4 > 200	119	167	1.00	1.00
CD ≤ 200	84	59	<b>1.99(1.33,3.00)</b>	<b>1.94(1.25,3.02)**</b>
Less than 50 kg	94	82	<b>1.51(1.03,2.23)</b>	1.11(0.72,1.70)
Greater than or equal 50 kg	109	144	1.00	1.00
Health condition of spouse				
Health	57	84	1.00	1.00
Chronic	86	87	1.46(0.93,2.28)	1.44(0.68,2.39)
Dead	40	28	<b>2.11(1.17,3.79)</b>	1.69(0.91,3.14)
Unknown	20	27	1.09(0.56,2.13)	1.16(0.57,2.37)
Perceived stress				
Presence	75	119	<b>1.90(1.29,2.79)</b>	<b>2.23(1.44,3.46)**</b>
Absence	128	107	1.00	1.00

## Figures

## Prevalence of undiagnosed depression among newly diagnosed people living with HIV/AIDS

■ 1 ■ 2



**Figure 1**

Prevalence of undiagnosed depression among newly diagnosed PLWHIV on follow up in west shoa zone health facilities, oromia regional state, Ethiopia 2020