

Depression, Alcohol Use, Antiretroviral Therapy Adherence and HIV Status among HIV-infected from Multiple Antiretroviral Therapy Clinics in Nepal

Kunwar D,¹ Shrestha B,¹ Risal A,¹ Kunwar R,² Khadka S³

¹Department of Psychiatry
Kathmandu University School of Medical Sciences
(KUSMS)
Dhulikhel, Kavre, Nepal.

²Program Coordinator (HIV),
Save the Children,
Nepal.

³Department of Psychiatry,
Interfaith Medical Center,
New York, USA.

Corresponding Author

Dipak Kunwar

Department of Psychiatry,

Kathmandu University School of Medical Sciences
(KUSMS),

Dhulikhel, Kavre, Nepal.

E-mail: drdipak.kunwar@gmail.com

Citation

Kunwar D, Shrestha B, Risal A, Kunwar R, Khadka S. Depression, Alcohol Use, Antiretroviral Therapy Adherence and HIV Status among HIV-infected from Multiple ART Clinics in Nepal. *Kathmandu Univ Med J.* 2019;68(4):336-40.

ABSTRACT

Background

Depression and alcohol use disorder are very common among people living with HIV infection, these disorders are not only common among HIV patients but also associated with antiretroviral therapy (ART) non adherence, morbidity and mortality.

Objective

The objective of our study is to study the prevalence of Depression, Alcohol use, and ART treatment adherence.

Method

This is a analytical cross-sectional study. Total of 221 participants were included in the study. Convenient method of sampling was used to collect the data from three district Kathmandu, Lalitpur and Kavre ART (Antiretroviral treatment) clinics. Beck Depression Inventory (BDI) was used for the assessment of depression, Alcohol use disorders identification test (AUDIT) was used for alcohol related problems and Visual analogue scale (VAS) was used for treatment adherence. Chi square test and multiple linear regression analysis were conducted for testing bivariate and multivariate relationship of sociodemographic and clinical factors with depression and treatment adherence.

Result

The 40% participants found to have depression. Variables associated with depression significantly after multiple regression analysis were employment (p value=0.04) and mode of transmission (p value= 0.003). More than half, 56% of the participant's CD4+ cells count was <500 per cubic millimetre and 71% participant's viral load was undetectable. Clinical variables mode of transmission (pvalue=0.000), duration of illness (p value=0.03) and duration of treatment (p value=0.01) were significantly associated with depression. ART treatment adherence was significantly associated with CD4 cell (p value=0.02) and viral load (p value= 0.05).

Conclusion

Depression is very prominent among HIV positive patients. Low CD4+ cell count and high viral load has been seen among patients who are not adherent to antiretroviral treatment. It is suggested that clinicians should carefully assess the possibility of depressive symptoms in their patients on ART treatment.

KEY WORDS

Antiretroviral therapy, Adherence, Depression, HIV-infection

INTRODUCTION

United Nations Programme on HIV/AIDS estimates that in 2018, 36.9 million people are living with HIV infection globally.¹ In Nepal 31,020 are living with HIV infection among them 19,020 are male, 12000 are females, 1192 are children's (0-14 years).² HIV infection and mental illness are closely intertwined conditions.³ The most common reported disorders include depression, anxiety, post-traumatic stress disorder, and alcohol use disorder.⁴ The prevalence estimates of major depressive disorder among persons living with HIV (PLWH) ranging from 20% to as high as 37%.^{5,6} This is a threefold greater prevalence of major depression than in the general population.⁷ Alcohol use disorders among patients living with HIV infection seems to be 2-4 times higher than those disorders in the general population and it is estimated that 40 to 50% of these individuals have a history of alcohol abuse or dependence.⁸⁻¹¹

Depression and alcohol use disorder are not only prevalent among people living with HIV infection, both are associated with antiretroviral therapy (ART) nonadherence and ART non adherence contributes to greater morbidity and mortality among HIV-infected individuals.^{12,13}

Depression is also associated with decline in CD4+ count and decrease in virological response.¹⁴⁻¹⁶ Mental health among HIV positive has been neglected and there is lack of research in Nepal. In spite of this bi-directional link between HIV/AIDS and mental illnesses, there has been a paucity of research focusing on mental health among people living with HIV/AIDS (PLHA). Therefore, more work is necessary in order to get timely and appropriate treatment to that in need and to understand the impact of depression alcohol use disorder and ART adherence among those affected by HIV.

Therefore, we aim to study the prevalence of Depression, AUD and ART treatment adherence among HIV positive patients.

METHODS

The study was initiated after receiving approval from the Institutional Review Committee (IRC), Kathmandu University School of Medical Sciences (KUSMS). Informed consent was obtained from all study participants.

This was a analytical cross-sectional study. All the HIV positive patients from three district Kathmandu Lalitpur and Kavre ART clinics who were ready to participate were included in the study. Patients who were critically ill, who were known case of depression, who had organic cause of mental illness and not willing to participate were excluded from the study. We used convenient method of sampling and data collection was done in between May 2019 to June 2019. Informed consent was obtained once participants were agreed for the study. Some of the socio-demographic

variables were dichotomized for better understanding and analysis.

We designed a questionnaire focusing on socio-demographic profile of patients. The questions concerned: age, marital status, occupation, education, religion, caste, socio economic status, personal history of psychiatric illness medical illness and alcohol use.

Beck Depression Inventory was used to measure Depression in this study. Beck Depression Inventory is a 21 question scale for the assessment of depression. Each question is rated from 0-3. BDI has been translated and validated in Nepali population. The cut off score of 16/17 for Nepali version of BDI provides sensitivity of 0.85 and specificity of 0.86 and cronbach's alpha 0.88.¹⁷ The alcohol use disorders identification test (AUDIT) was used to detect alcohol related problems. AUDIT scale has 10 items. Items 1-3 for the assessment of alcohol intake, item 4-6 for alcohol dependence and item 7-10 for alcohol-related problems. Questions 1-8 are scored from 0 to 4, questions 9 and 10 are scored 0, 2 or 4, resulting in a maximum AUDIT score of 40. The Nepali version of AUDIT recommend For males: 0-4 no problem, 5-10 hazardous drinking, ≥ 11 alcohol dependence and For females: 0-3 no problem, 4-10 hazardous drinking, ≥ 11 alcohol dependence. The chronbach's coefficient of Nepali version of AUDIT was 0.82.¹⁸ Visual analogue scale is a single item visual analogue rating scale (VAS). The scale has line anchored at 0% and 100% with example of what 0%, 50% and 100% adherence would represent. Patients are asked to assess their own adherence during 3 to 4 weeks period.

Descriptive and inferential statistics were used. Chi square test and multiple regression analysis was done to address relationship of different variables. P value of < 0.05 was considered significance. The Statistical Package for Social Science software (IBM SPSS Statistics 21, Chicago, USA) was used for analysis.

RESULTS

The totals of 221 participants were included in the study. Among them 75% were below 45 years of age, majority of them 80% were female and 82% were Hindu by religion. The most of the participants 81% had formal education. Caste distribution was almost equal 51% were Mongolian and 49% were non-Mongolian. Most of the participants belonged to low socioeconomic status. The 40% participants found to have depression. Depression was evaluated across different variables. Socio-demographic variables found to be statistically significant were sex, education, socioeconomic status and employment (table 1). Clinical variables found to be statistically significant with depression were mode of transmission, duration of illness, and duration of treatment (table 2) and variables remained significant even after multiple regression analysis were occupation and mode of transmission (table 4). More than

Table 1. Socio-demographic Variables and its association with Depression.

Variables		N=221 (%)	Depression Yes N =104 (%)	Statistics χ^2 df p-value
Age (in years)	<45	166(75)	75(72)	0.94
	45 and above	55(25)	29(28)	1 0.33
Sex	Male	45(20)	13(12.5)	7.50
	Female	176(80)	91(87.5)	1 0.006
Religion	Hindu	182(82)	83(80)	0.87
	Non Hindu	39(18)	21(20)	1 0.35
Education	No formal	41(19)	27(26)	7.13
	Formal	180(81)	77(74)	1 0.008
Caste	Mongolian	113(51)	57(55)	1.06
	Non Mongolian	108(49)	47(45)	1 0.30
Socioeconomic status	Low	172(78)	92(88.5)	12.87
	Middle and above	49(22)	22(11.5)	1 0.000
Residence	Rural	125(57)	63(61)	1.28
	Urban	96(43)	41(39)	1 0.25
Employment	Employed	141(64)	56(54)	8.42
		80(36)	48(46)	1 0.004

Table 3. HIV status and its association with Treatment Adherence.

Variables		N=221 (%)	Treatment adherence Yes N =200 (%)	Statistics χ^2 df p-value
CD4+ cell counts Per cubic millimeter	Up to 500	123(56)	106(53)	7.38
	500 and above	41(18)	41(20.5)	2 0.02
	Not done	57(26)	53(26.5)	
Viral load Copies per ml	Undetectable	156(71)	142(71)	5.90
	Detectable	15(7)	11(5.5)	2 0.05
	Not done	50(22)	47(23.5)	

half, 56% of the participant’s CD4+ cells count was <500 per cubic millimetre and 71% participants viral load was undetectable. ART treatment adherence was significantly associated with CD4 cell and viral load (Table 3).

DISCUSSION

In this study, most of the participants 75% belonged to age group < 45 years of age which was similar with another study from Nepal.¹⁷ Our study reported 40% depression among all studied population using BDI, which was comparable with the study from Nigeria which reported prevalence of 39.6%.¹⁸ Studies from Nepal reported

Table 2. Clinical Variables and its association with Depression.

Variables		N=221 (%)	Depression Yes N =104 (%)	Statistics χ^2 df p-value
Mode of transmission	Sexual	156(71)	86(83)	13.86
	Non Sexual	65(29)	18(17)	1 0.000
Duration of illness	Up to 4 years	115(52)	62(60)	4.52
	4 years and above	106(48)	42(40)	1 0.03
Concurrent TB	Yes	48(22)	22(21)	0.03
	No	173(78)	82(79)	1 0.84
Alcohol dependence	Yes	8(4)	4(4)	0.02
	No	213(96)	100(96)	1 0.86
Duration of treatment	Up to 4 years	128(58)	69(66)	5.72
	4 years and above	93(42)	35(34)	1 0.01
CD4+ cell counts Per cubic millimeter	Not done	57(26)	29(28)	2.28
	Up to 500	123(56)	60(58)	2 0.31
	500 and above	41(18)	15(14)	
Viral load Copies per ml	Not done	50(23)	26(25)	1.02
	Undetectable	156(70)	70(67)	2 0.60
	Detectable	15(7)	8(8)	
Treatment adherence	Complete	200(90.5)	94(90)	0.003
	Not complete	21(9.5)	10(10)	1 0.95

Table 4. Multiple regression analysis of Variables association with Depression.

	Unstandardize Coefficients		Standardized coefficients	t	p	95% CI	
	B	SE	Beta			lower	upper
Employment	0.14	0.07	0.13	2.0	0.04	0.003	0.27
Mode of transmission	-0.21	0.07	-1.97	-3.0	0.003	-0.35	-0.07

different range from 29% to 30%.^{19,20} One systematic review and meta-analysis from Africa reported pooled prevalence of depression ranged between 9% to 32% in HIV positive patients.²¹ However, prevalence as high as 63% has been reported in other studies.²² Such discrepancies might be due to the different measurement tools used like hospital anxiety depression scale (HADS), population being studied, the study periods and the sample size used.

The association of depression with low socioeconomic condition and female sex in our study was consistent with systematic review and meta-analysis from Bernard et al.²¹ Other sociodemographic variables found to be associated with depression in our study were education

and employment but we did not find any association with age, caste, religion and place of residence. Study done by Tiwari et al. from Nepal reported no association depression among HIV patients with age, education, occupation, religion, caste and socioeconomic status.²¹ These socio-demographic factors are difficult to compare with findings from other countries because they have different caste and religion.

We found that the prevalence of depression decreases with duration of illness and duration of treatment which is in accordance with the previous study.²³

Variables which shows the clinical status of patients like CD4+ cell count and viral loads had no significant association with depression in our study and we have few studies who made the same conclusion, however there were many studies and meta-analysis has proven that depression is associated with low CD4+ cell count and viral load.^{14-16,21,24}

Among the socio-demographic factor found to be significantly associated with depression in both bivariate and multivariate regression analysis was employment. Study done by Hutton et al. reported relationship of unemployment with depression in HIV positive patients.²⁵

Another important finding from our study was that sexual transmission of HIV was significantly associated with depression both in bivariate and multivariate regression analysis. As we mentioned earlier 80% of our participants were female and 71% of our participants had sexual transmission it is possible that HIV positive female might experience more social stigma, they were considered sex workers, they were unable to negotiate for condom use and unwanted pregnancy, all these factors might be the reason this group reported to have high prevalence to Depression.

Our study did not show a significant relationship between clinical variables like concurrent TB infection, and treatment adherence with depression.

However, systematic review and meta-analysis by Uthman et al. reported lower rate of treatment adherence among patients with depression as compared to patients without depression, and that this relationship was consistent across different settings and samples.^{26,27}

In contrast to our study, it has been reported that HIV patients with concurrent TB infection found to have more depressed as compared to HIV patients without TB infection.²⁸

Treatment adherence has many benefits such as reduction in mortality rates, reduction in the occurrence of opportunistic disease, reduction in the frequency of hospital admissions and improves quality of life.²⁹

In our study 90.5% reported complete adherence, good adherence rate might be because of free ART treatment provided by the government. In a poor country where there is no compulsory medical insurance, free treatment could be the motivation to get the treatment regularly.

We found that the ART treatment adherence was associated with increased CD4 cell count and decreased inviral load, which was comparable with study done by Oliveira et al.³⁰

Alcohol use disorder is very common among HIV positive patients. One systematic review and meta-analysis reported prevalence is almost 30%, in contrast to the existing literature we found only 4% reported alcohol use which was quite surprising for us.³¹ It might be most of our participants were female and they might be stigmatized to reveal the alcohol taking history.

This study has several limitations. First, as it is a cross-sectional study, we cannot establish causal relationships based on the results. Second, we used self-reported depression symptoms and adherence level of treatments. Therefore, participants could have over or under-reported level of depression symptoms and ART treatment adherence. Third, Antidepressant drug use was not investigated and it may have influenced the depressive symptoms. Fourth could be confounding factors like drugs to treat tuberculosis and HIV causing Depression were not adjusted.

CONCLUSION

Depression is very prominent among HIV positive patients. Low CD4+ cell count and high viral load has been seen among patients who are not adherent to antiretroviral treatment. ART treatment non adherence is associated with low CD4+ cell count and high viral load. It is suggested that clinicians should carefully assess the possibility of depressive symptoms in their patients on ART treatment. Further Nationwide study is recommended to generalize the findings.

REFERENCES

- UNAIDS. Global AIDS update. 2018.
- Ministry of Health and Population, National Centre for AIDS and STD Control .2018 world AIDS day fact sheet. 2018. Kathmandu.
- Yehia BR, Cui W, Thompson WW, Zack MM, Eily LM, Di NNeno E, et al. HIV testing among adults with mental illness in the United States. *AIDS Patient Care STDs*. 2014; 28(12): 628–34.
- Brandt R. The mental health of people living with HIV/AIDS in Africa: a systematic review. *African Journal of AIDS Research*. 2009; 8(2): 123–33.
- Bing EG, Burnam MA, Longshore D, Fleishman JA, Sherbourne CD, London AS, et al. Psychiatric disorders and drug use among human immunodeficiency virus-infected adults in the United States. *Arch Gen Psychiatry*. 2001;58(8):721–8.
- Valente SM. Depression and HIV disease. *J Assoc Nurses AIDS Care*. 2003; 14(2):41–51.
- Kessler RC, Gruber M, Hettema JM, Hwang I, Sampson N, Yonkers KA. Co-morbid major depression and generalized anxiety disorders in the National Comorbidity Survey follow-up. *Psychol Med*. 2008;38(3):365–74.
- Galvan FH, Bing EG, Fleishman JA, London AS, Caetano R, Burnam MA, et al. The prevalence of alcohol consumption and heavy drinking among people with HIV in the United States: results from the HIV cost and services utilization study. *J Stud Alcohol*. 2002;63:179–86.
- Vagenas P, Azar MM, Copenhaver MM, Springer SA, Molina PE, Altice FL. The impact of alcohol use and related disorders on the HIV continuum of care: a systematic review: alcohol and the HIV continuum of care. *Curr HIV/AIDS Rep*. 2015; 12:421–36.
- Petry NM. Alcohol use in HIV patients: what we don't know may hurt us. *Int J STD AIDS*. 1999; 10:561–70.
- Samet JH, Phillips SJ, Horton NJ, Traphagen ET, Freedberg KA. Detecting alcohol problems in HIV-infected patients: use of the CAGE questionnaire. *AIDS Res Hum Retrovir*. 2004; 20:151–5.
- Mayston R, Kinyanda E, Chishinga N, Prince M. Mental disorder and the outcome of HIV/AIDS in low-income and middle-income countries: a systematic review. *AIDS*. 2012; 26(2):S117–135.
- Cohen MS, Chen YQ, McCauley M, Gamble T, Hosseinipou MC, Kumarasamy N, et al. Prevention of HIV-1 infection with early antiretroviral therapy. *N Engl J Med*. 2011; 365(6):493–505.
- Bouhnik AD, Preau M, Vincent E, Carrieri MP, Gallais H, Lepeu G, et al. Depression and clinical progression in HIV-infected drug users treated with highly active antiretroviral therapy. *Antivir Ther*. 2005; 10: 53–61.
- Ironson G, O'Clairigh C, Fletcher MA, Laurenceau JP, Balbin E, Klimas N, et al. Psychosocial factors predict CD4 and viral load change in men and women with human immunodeficiency virus in the era of highly active antiretroviral treatment. *Psychosom Med*. 2005; 67: 1013–21.
- Anastos K, Schneider MF, Gange SJ, Minkoff H, Greenblatt RM, Feldman J et al. The association of race, sociodemographic, and behavioral characteristics with response to highly active antiretroviral therapy in women. *J Acquir Immune Defic Syndr*. 2005; 39: 537–44.
- Kohrt BA, Kung RD, Koirala NR, Sharma VD, Nepal MK. Validation of the Nepali version of Beck Depression Inventory. *Nepalese Journal of Psychiatry*. 2002;2(4):123–30.
- Pradhan B, Chappuis F, Baral D, Karki P, Rijal S, Hadengue A, Gache P. The alcohol use disorders identification test (AUDIT): validation of a Nepali version for the detection of alcohol use disorders and hazardous drinking in medical settings. *Substance abuse treatment, prevention and policy*. 2002;7: 42.10
- Timilsina S, Regmi K. Assessing Quality of Life and Depression Among People Living With HIV/AIDS and TB-HIV Coinfection in Kathmandu, Nepal. *SAARC Journal of Tuberculosis, Lung Diseases and HIV/AIDS*. 2015;11:7–14.
- Adeoti AO, Dada MU, Fadare JO. Prevalence of depression and anxiety disorders in people living with HIV/AIDS in a tertiary hospital in southwestern Nigeria. *Medical Reports and Case Studies*. 2018;3:150
- Shrestha S, Poudel KC, Poudel-Tandukar K, Kobayashi J, Pandey BD, Yasuoka J, et al. Perceived family support and depression among people living with HIV/AIDS in the Kathmandu Valley, Nepal. *J Int Assoc Provid AIDS Care*. 2014;13(3):214–22.
- Tiwari S, Ojha S, Chapagai M, Tulachan P, Dhungana S. Depression in HIV Positives under ART in TUTH Clinic: A Cross-Sectional Study. *Journal of Psychiatrists' Association of Nepal*. 2017; 4(2):25–9.
- Bernard C, Dabis F, de Rekeneire N. Prevalence and factors associated with depression in people living with HIV in sub-Saharan Africa: A systematic review and meta-analysis. *PLoS one*. 2017;12(8):e0181960.
- Elbadawi A, Mirghani H. Depression among HIV/AIDS Sudanese patients: a cross-sectional analytic study. *Pan Afr Med J*. 2017; 26: 43.
- Bhatia MS, Munjal S. Prevalence of Depression in People Living with HIV/AIDS Undergoing ART and Factors Associated with it. *J Clin Diagn Res*. 2014;8(10):WC01–WC04.
- Liu H, Zhao M, Ren J, Qi X, Sun H, QU L, et al. Identifying factors associated with depression among men living with HIV/AIDS and undergoing antiretroviral therapy: a cross-sectional study in Heilongjiang, China. *Health Qual Life Outcomes*. 2018;16(1):190.
- Hutton HE, Lyketos CG, Zenilman JM, Thompson RE, Erbeling EJ. Depression and HIV risk behaviors among patients in a sexually transmitted disease clinic. *Am J Psychiatry*. 2004;161:912–4.
- Uthman OA, Magidson JF, Safren SA, Nachega JB. Depression and adherence to antiretroviral therapy in low-, middle- and high-income countries: a systematic review and meta-analysis. *Curr HIV/AIDS Rep*. 2014; 11(3):291–307.
- Gonzalez JS, Batchelder AW, Psaros C, Safren SA. Depression and HIV/AIDS treatment nonadherence: a review and meta-analysis. *J Acquir Immune Defic Syndr*. 2011; 58(2):181–7.
- Duko B, Gebeyehu A, Ayano G. Prevalence and correlates of depression and anxiety among patients with tuberculosis at Wolaita Sodo University Hospital and Sodo Health Center, Wolaita Sodo, South Ethiopia, Cross sectional study. *BMC Psychiatry*. 2015; 15:214.
- Oliveira LS, Caixeta LM, Martins JL, Rodrigues M, Deyse S, Rodrigo M, et al. Adherence to antiretroviral therapy and correlation with adverse effects and co-infections in people living with HIV/AIDS in the municipality of Goiás State. *Rev Soc Bras Med Trop*. 2018; 51(4): 436–44.
- Duko B, Ayalew M, Ayano G. The prevalence of alcohol use disorders among people living with HIV/AIDS: a systematic review and meta-analysis. *Subst Abuse Treat Prev Policy*. 2019;14:52