

Original Research Article

Title: Prevalence of depression in seropositive HIV patients undergoing treatment at ART Plus center of Hamidia Hospital Bhopal

**Dr. Dileep Dandotiya¹, Dr. Anshuli Trivedi², Dr. Mahesh Gupta³, Dr. Ritesh Upadhyay^{4*},
Dr. Mohan Shinde⁵**

- 1- Assistant Professor, Department of Community Medicine, Chhindwara Institute of Medical Sciences, Chhindwara, M.P.
- 2- Associate Professor, Department of Community Medicine, Gandhi Medical College, Bhopal, M.P.
- 3- Assistant Professor, Department of Community Medicine, Govt. Medical College, Ratlam, M.P.
- 4- Assistant Professor, Department of Community Medicine, Chhindwara Institute of Medical Sciences, Chhindwara, M.P.
- 5- Professor & Head (Rtd.) , Department of Community Medicine, Gandhi Medical College, Bhopal, M.P.

***Corresponding author:** Dr. Ritesh Upadhyay, Assistant Pofessor, Department of Community Medicine, Chhindwara Institute of Medical Sciences, Chhindwara, M.P.- 480001, Email id: drritesh311@gmail.com

Abstract

Background: Depression is one of the most common neuropsychiatric complications of HIV disease, and in turn it is associated with worse HIV-related outcomes. HIV/AIDS is a significant cause of death and disability, especially in low- and middle-income countries. UNAIDS estimates that in 2017, 36.7 million people were living with HIV (PLHIV). Mental health and HIV/AIDS are closely interlinked; mental health problems, including substance-use disorders, are associated with increased risk of HIV infection and AIDS and interfere with their treatment, and conversely some mental disorders occur as a direct result of HIV infection.

Objectives: The main objective of this study was to assess the prevalence of depression amongst patients with seropositive for HIV attending ART plus centre of Hamidia Hospital, Bhopal

Material and methods: The study was carried among 250 newly diagnosed HIV/AIDS positive persons attending the ART plus centre of Hamidia hospital Bhopal India. All the patients, male, female, and transgender in the age range of 18-65 years and willing to participate were included in this study during the period April 2017 to March 2018. Informed verbal consent was obtained for each patient at the time of study. Patients were studied for their different socio-demographic parameters and level of depression among the HIV/ AIDS patients.

Results: The prevalence of depression was found to be 43.2%. Age range of study population was 18 years to 65 years, with 57.66% males and 42% females and 0.8% transgender. Majority of the patient's (82.67%) were in adult (15 to 49 years) age group. Heterosexual contact was the commonest (95.62%) mode of HIV transmission. Most common occupation group, among males was laborers while most of females were house wives accounting for 26.33% and 34% of the study group respectively. Majority of patients belonged to class IV (34.66%) and class III (34.33%) of socioeconomic status. Commonest associated systemic disease was tuberculosis,

seen in 14% of patients. Unprotected sexual route was the most common (91.5%) mode of transmission; among which heterosexual route was found to be the commonest (95.62%).

Conclusion: Majority of patients belonged to low socioeconomic status and in young and productive age group with heterosexual contact being commonest mode of transmission. Majority of our patients were at relatively good immune status, and in early stage of the disease. Mild depression was common as compare to the moderate depression.

Keywords: HIV, AIDS, ART Plus centre, Prevalence, Depression

Introduction: Depression is among the most common neuropsychiatric disturbances seen in individuals with HIV/AIDS infection. It is associated with sad mood, disturbed sleep and appetite, and low energy. It is also associated with isolated lives, the absence of pleasure, and social and vocational impairment. Epidemiological analysis of reported HIV/AIDS cases reveals that HIV/AIDS is affecting mainly young people in the sexually active age group.

HIV/AIDS is a multi-systemic disease affecting various systems and organs of the body, once infected; a person will be infected for life. It affects the immune system of the body and makes the victim vulnerable to life threatening opportunistic infections neurological disorders and unusual malignancies. It affects the entire demographic and economic structure of the society by affecting morbidity and mortality amongst youth and elders. The human immunodeficiency virus infection is a global pandemic. It continues to be a burden globally and presents serious public health problems in the developing countries, like India. Globally over 36.7 million persons are living with this disease.^[1] It is the leading cause of death in the world due to infectious diseases. Despite the improved access to antiretroviral therapy (ART) and care in many regions of the world AIDS has killed millions of people every year. According to the National AIDS Control Organization the total number of people infected with HIV in India is estimated at 21.17 lakhs in 2015 with a seropositivity rate of 1.86%, as compared to 22.26 lakhs in 2007.^[2] However, the lower estimates than before does not mean a decline in the epidemic but it only points out that the epidemic is under control because of enormous effort and mobilization over the past decade. In 2015 adult HIV prevalence was estimated at 0.3% among males and at 0.22% among females.^[2] HIV/AIDS is no longer just a public health issue in India but also one of the most serious socioeconomic and developmental concerns, because nearly 86% of reported cases are occurring in sexually active and economically productive age group (15-44yrs).^[2]

In the reference of HIV/AIDS, depression is an often overlooked but potentially dangerous condition that can influence not only quality of life, relationships, employment, and adherence to medical care, but also perhaps survival. People living with HIV often suffer from depression as they adjust to the impact of the diagnosis and face the difficulties of living with a chronic life-threatening illness, of which cure is yet to be discovered.^[3] Depression has an important impact on the course and outcome of HIV infection through its effects on patient's adherence to medication regimens and via psychoneuro immunological mechanisms. In spite of its importance, it is likely that depression is under recognized and under treated in patients with HIV infection. HIV/AIDS though such a big public health problem worldwide, not enough data is available regarding association of HIV and depression. Further, Depression may precede HIV infection or HIV infection may cause psychiatric morbidity either directly or indirectly or a common etiologic factor may predispose to both HIV infection and depression. Therefore this study was undertaken to determine the association between

HIV/AIDS and depression amongst the seropositive attendees of ART Plus centre of Gandhi Medical College, Bhopal, Madhya Pradesh.

Material and Methods: The present study was a hospital based observational cross-sectional study. The study carried out in ART plus centre of Hamidia hospital, Bhopal. The ART plus centre is affiliated to National AIDS Control Organisation (NACO). A total of 250 newly diagnosed HIV/AIDS patients were enrolled in the study, by using opportunistic sampling technique from April 2017 to March 2018. The data was collected through face to face interview of HIV patients. The relevant data related to infection, socio-demographic profile, staging of disease, CD4 counts, duration of disease, laboratory investigation and treatment were collected from patient's treatment record card. The level of depression was assessed by using the Hamilton depression rating scale. The purpose of the study was to study the prevalence of depression in seropositive HIV/AIDS patients undergoing treatment at ART plus centre Bhopal.

Inclusion criteria

All newly diagnosed patients age >18 years who will give the consent for the study.

Exclusion criteria

- Patients who were not willing to give informed verbal consent.
- Patients who did not co-operate for proper interview and examination.

Ethical issues: Ethical clearance was obtained from the ethical committee of the institution. Informed verbal consent was obtained from the participants before administering questionnaire and confidentiality of the information provided by them was ensured.

Observation & Results

Table- 1: Sociodemographic profile of HIV positive patients (n=250)

Sociodemographic variants	No.	%
Age		
≤ 20 years	13	5.2
21-30 years	96	38.4
31-40 years	76	30.4
41-50 years	44	17.6
>50 years	21	8.4
Sex		
Male	173	69.2
Female	75	30.0
Transgender	2	0.8
Occupation		
Laborer	60	24.0
Housewife	58	23.2
Driver	32	12.8
Farmer	25	10.0
Servicemen	24	9.6
Business	12	4.8
Student	11	4.4
Others	28	11.2

Marital status		
Unmarried	61	24.4
Married	168	67.2
Widow/widower	16	6.4
Divorced/separated	5	2.0
Type of family		
Nuclear	168	67.2
Joint	82	32.8
Habitat		
Urban	140	56.0
Rural	110	44.0

In the present study mean age of the study participants was found 34.63 (± 10.17) years and the maximum number of patients 229 (91.6%) were in the age group of 18-50 years. 21 (8.4%) patients were >50 years of age. Out of 250 patients, the male patients 173 (69.2%) outnumbered the female patients 75(30%) and intersex 2 (0.8%) patients. Male to female ratio was 2.3:1.

Also present study reveals that 27.6% of ART attendees were unemployed and 72.4% were employed. 24.0% ART attendees belonged to laborers followed by house wife (23.2%), drivers (12.8%) which included both truck drivers and auto drivers, others (11.2%) which included shopkeeper, military person, security guard, contractors. farmers (10.0%), servicemen (9.6%), business (4.8%) and student (4.4%). Among the total patients studied, 168 (67.2%) were married and living with their spouse followed by 61 (24.4%) unmarried, 16 (6.4%) widows, and 5 (2.0%) were divorced or separated. Out of total study subjects 140 (56.0%) were belonged to urban area of residence and 110 (44.0%) were from the rural area. (Table 1)

Table -2: Socio-economic status of HIV positive patients (n=250)

Socio-economic status (as per modified BG Prasad scale)		
I (Upper class)	17	6.8
II (Upper middle)	28	11.2
III (Middle class)	76	30.4
IV (Lower middle class)	99	39.6
V (Lower class)	30	12
Education		
Illiterate	81	32.4
Primary	68	27.2
Middle	31	12.4
High school	32	12.8
Higher secondary	10	4.0
Graduate & above	28	11.2

In the present study, on the basis of per capita monthly income in Indian currency (Modified BG Prasad socioeconomic classification scale 2018) socioeconomic status of the patients reveals that majority i.e. 99 (39.6%) were from class IV socioeconomic class followed by 76 (30.4%) patients belonging to class III socioeconomic class, 30 (12.0%) were from lower socioeconomic

class, 28 (11.2%) patients belonged to class II socioeconomic class while 17 (6.8%) patients belonged to class I socioeconomic status. Out of 250 patients, 81 (32.4%) were illiterate while 169 (67.6%) were literate. Among literates, maximum number of patients i.e. 68 (27.2%) were educated primary school level. Only 28 (11.2%) attendees were educated college and above. (Table 2)

Table-3: Distribution of ART attendees according to level of depression (according to HAM-D scale)

Score (Level of depression)	Number	%
0-7 (Nil)	142	56.8
8-13 (Mild)	91	36.4
14-18 (Moderate)	17	6.8
19-22 (Severe)	0	0.0
>23 (Very severe)	0	0.0

Above table shows that 91(36.4%) ART centre attendees had mild depression and 17(6.8%) ART centre attendees had moderate depression. Overall 43.2% attendees had mild to moderate level of depression compare to those 56.8% attendees who were not depressed at all. (Table 3)

Table:4- Bivariate analysis between depression and no depression in relation with socio demographic characteristics and other factors among attendees of ART centre Bhopal

Characteristics	Total number (n=250)	Depression n (%)	No depression n (%)	p-value
Sex				
Male	173 (69.2)	75 (43.3)	98 (39.2)	0.000*
Female	75 (30.0)	31 (41.3)	44 (58.7)	
Transgender	2 (0.8)	2 (100.0)	0 (0.0)	
Age				
≤40 years	185 (74.0)	80 (43.2)	105 (56.7)	1.078
>40 years	65 (26.0)	28 (43.1)	37 (56.9)	
Marital status				
Married	170 (68.0)	73 (42.9)	97 (57.0)	0.940
Unmarried	80 (32.0)	35 (43.7)	45 (56.2)	
Education level				
Illiterate	81(32.4)	37 (45.7)	44 (54.3)	1.342
Less than 8 th std	99 (39.6)	45 (45.4)	54 (54.5)	
More than 8 th std	70 (28.0)	26 (37.1)	44 (62.8)	
Occupation				
Employed	181 (72.4)	79 (43.6)	102 (56.3)	0.860
Unemployed	69 (27.6)	29 (42.0)	30 (43.5)	
Type of family				

Nuclear	168 (67.2)	75 (44.6)	93 (55.3)	0.815
Joint	82 (32.8)	33 (40.2)	49 (59.7)	
Place of living				
Rural	110 (44.0)	46 (41.8)	64 (58.2)	0.018*
Urban	140 (56.0)	62 (44.3)	78 (55.7)	
Smoking				
Yes	58 (23.2)	30 (51.7)	28 (48.3)	0.664
No	192 (76.8)	78 (40.6)	114 (59.4)	
Alcohol consumption				
Yes	58 (23.2)	28 (48.3)	30 (51.7)	0.870
No	192 (76.8)	80 (41.7)	112 (58.3)	
History of migration				
Yes	79 (31.6)	42 (53.2)	37 (46.8)	0.015*
No	171 (68.4)	66 (38.6)	105 (61.4)	
History of STI/RTI				
Yes	57 (22.8)	36 (63.1)	21 (36.8)	0.0004*
No	193 (77.2)	77 (39.9)	116 (60.1)	
Behaviors of family members				
Co-operative	194 (77.6)	88 (45.4)	106 (54.6)	0.022*
Un-cooperative	56 (22.4)	20 (35.7)	36 (64.3)	

*Statistically significant

Above table shows that out of our 250 attendees, 43.2% had depression and 56.2% did not have depression and the proportion of attendees were males (69.2%), females (30.0%) and transgender (0.8%) (p value <0.05), and also the significant association was found with history of migration and depression. (p value <0.05). History of STI/RTI was significantly associated with depression. (p value <0.05). Also significant association was found between behaviors of family members with level of depression. (p value <0.05). Other factors such as age, marital status, educational status, occupation, type of family, smoking and alcohol consumption were not found to be significantly associated with depressive symptoms. (Table 4)

Discussion: In the study, 250 HIV/AIDS patients were registered during the period of one year (April 2017 to March 2018). The distribution of the patients according to the age showed that most of the patients 172 (68.8%) were in the age group of 21–40 years. The observation regarding age distribution in our study was found similar with other study conducted by M.S. Bhatia et al.^[4]. HIV/AIDS generally affects the younger age group, which is economically productive and generate a big threat to the community. A similar study was conducted at Aligarh reported the mean age of HIV/AIDS patients as 29.68 ± 11.92 years, with 68.7% of the patients in the age group of 20–39 years.^[5] Another study reported the mean age of patients as 35.6 years and 75% of the patients were in the age bracket of 20–49 years.^[6] In present study, male participants were more affected as compared to female participants. Male predominance was also observed in study conducted by Ahmed et al.^[7] Male predominance might be because, in the

existing social setup, female subjects do not seek medical care fearing social stigma and also neglect the associated sickness, which decreases the number of females to seek medical help. So, the low number of female subjects may not be the true representation of female population. Most of the patients 81(32.4%) were illiterates, followed by primary education 68 (27.2%), high school 32(12.8%), middle school 31(12.4%), graduate & above 28(11.2%) and higher secondary education 10(4.0%). This study shows that higher educational levels offer some protection against HIV. Anybody who is illiterate and educated below the secondary education level may not have adequate knowledge for protecting himself or herself from sexually transmitted diseases, including HIV/AIDS. This was in accordance with the findings of the study conducted by Chennaveerappa et al.,^[8] where 32% of the male seropositive subjects and 45% of the female seropositive subjects were illiterates. Majority of the patients were laborers (24.0%), housewife (23.2%), and drivers (12.8%), Majority of the patients who were laborers and driver has their living hood that require periods of stay away from the family, these appear to be the factors responsible for the drivers to be mostly affected in the epidemic. Most of the study participants (39.6%) belonged to the lower middle socioeconomic class that had a per capita income of between Rs 938 to Rs. 1875 per month. The impact of the infection on occupation can be seen by the fact that while studying the past & present occupation it was found that many individuals who were engaged in skilled occupation turned out to be laborers or jobless after knowing their HIV infected status.

In our study maximum 39.6% ART attendees were belonged to lower middle class followed by middle class (30.4%), lower class (12.0%), upper middle class (11.2%) and upper class (6.8%). This finding is similar with the study conducted by B. Unnikrishnan, et. al., 2012^[9] who found that around 35% belonged to middle class 65% belonged to lower class. This finding of our study is dissimilar to findings of Rai & Verma, 2015^[10] who concluded that 51.9% has lower middle class socioeconomic status.

In present study history of migration for work was found by 31.6% study participants. This is supported by a study done by M.S. Bhatia et. al., 2014^[11] indicated that 74% were migrants and 85% were non migrants in their study. In the present study the prevalence of depression was found among 108 (43.2 %) seropositive HIV attendees. Among them 91(36.4%) were suffering from mild depression and 17(6.8%) were suffering from moderate depression and as such no case of severe depression or very severe depression was found. These findings of our study are similar to the study from Ethiopia where prevalence of depression was found 43.9 % among study participants. (Haftu Berhe and Alemayehu Bayray, 2013)^[12]. In present study ART center attendees with age <40 year (43.2.0%) were more depressed as compared with age >40 years (43.1%) and highly significant association was found with age of ART center attendees and depression ($p < 0.000$). This study finding of study is similar with study conducted by Adetunji Obadeji, et. al. 2014^[13] where they found out the prevalence of depression was more in respondents age <40 years (23.9%) than respondents age >40 years (21.4%). In our study males (43.35%) are more depressed as compared to the females (41.33%) and no significant association was found between gender and depression ($p > 0.05$). This study finding is dissimilar to the study done by Namita et al, 2013^[14] from India showed that 43.7% suffered from mild to severe depression and 59.9% female patients suffered from mild to severe depression, It was observed that depression were reported more in females than in males and this association was found statistically significant ($p < 0.05$). In present study significant association with behavior of family members towards HIV positive status and depression was found. ($p = 0.022$). 77.6% family members were co-operative after

knowing the HIV positive status of the respondents and among them 45.4% were found to be depressed, 54.6% were not depressed. 22.4% family members were un-cooperative and among them 35.7% were found to be depressed and 64.3% were not depressed. This study finding is dissimilar with the study done by Ndu A.C., et. al., 2011^[15] reported that 21.8% attendees who were not get any co-operation or support from family were more depressed and 20.0% of attendees who were get any support by family or relatives/social were depressed. In present study significant association has been observed with history of STIs and depression. ($p = 0.006$). 57(22.8%) ART attendees had history of STI and among them 21(36.8%) were found to be depressed and 36(63.2%) were not to be depressed. This finding of our study is similar to the study done by Smarajit Jana, et. al., 2017^[16] where they found the result of history of STI with depression was 34.0%. The present study reveals that 108(43.2%) ART attendees were found to be depressed and out of them 38(51.35%) of ART attendees were in middle socioeconomic class followed by lower middle socioeconomic class 38(39.2%) were found depressed. These findings of our study is dissimilar with a study Namita Navanit Deshmukh, et. al., 2017^[17] where depression was significantly more prevalent in patients who belonged to lower socioeconomic class (50.7%) than those who belonged to middle and upper socioeconomic class (30.4%).

Conclusion: In our study most of the affected study population was from low to middle socioeconomic class and reproductive age group i.e. 18-49 years which increases the economic burden and affects the overall development of the family, community and country. Laborers which were the most common occupation found to be affected acts as a link population between high risk groups to general population. Heterosexual route was the commonest mode of transmission. Marital life itself becomes a risk factor for those women who get infected by their HIV positive spouse. Overall, prevalence of depression was 43.2%.

Recommendation:

On the basis of the observations made in the present study, following intervention are suggested which may be disseminated to health care providers, social workers and service providers to help PLHIVs lead a better and a productive life.

- STIs should be treated as soon as diagnosed. Improved functioning of STI clinics to have good control on STDs, condom promotion, easy and free availability of condoms to general public.
- More job opportunities should be created in native areas of living so that migration can be decreased.
- A continuous monitoring of mental health should be done so that patients do not suffer from severe form of depression and in case it is found that if the patient suffers from more spells or severity of depression he/she should be referred immediately for psychiatric consultation.
- Due counseling of family members by a trained psychologist or counselor should be done so that tender love and care can be given to the patients by family members.
- There is need of more research on mental health aspects of HIV/AIDS patients who are seropositive for HIV.

Limitations: This study is a cross-sectional study, undertaken in special study subjects, (i.e. HIV positive people). Hence, its results on depression particularly with regard to its prevalence

rate, cannot be compared with other studies, under-taken in general populations. We have registered our new cases from among persons attending the ART clinic. This sample may not be truly representative of the population of PLHIVs in the city, as they are more likely to be health conscious and attend clinic regularly. And data collection was based on history and patients perception.

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References:

1. AIDS Epidemic Update. WHO/UNAIDS, December 2017. Available at <http://www.unaids.org/en/HIV-data>.
2. NACO Annual Report 2016-17. Available at: <http://www.naco.gov.in/sites/default/files/NACO%20ANNUAL%20REPORT%202016-17.pdf>.
3. Owe-Larsson B, Sall L, Salamon E, Allgulander C (2009) HIV infection and psychiatric illness. *Afr J Psychiatry* 12: 115-128.
4. M.S. Bhatia, Sahil Munjal: Prevalence of Depression in People Living with HIV/AIDS Undergoing ART and Factors Associated with it, *Journal of Clinical and Diagnostic Research*. 2014 Oct, Vol-8(10): WC01-WC04
5. Zaheer MS, Rabbani MU, Zuber A, Khan T, Rewari BB, Pandey DK. Clinical and demographic profile of AIDS in and around Aligarh. *J Indian Acad Clin Med* 2003;4:121–6.
6. Amballi AA, Ajibola A, Ogun SA, Ogunkolo OF, Salu LO, Oritogun KS, et al. Demographic pattern and haematological profile in people living with HIV/AIDS in a university teaching hospital. *Sci Res Essays* 2007;2:315–8.
7. Ahmed Z, Zaheer MS, Rabbani MU, Khan T, Rewari BB, Pandey DK. Clinical and demographic profile of patients of AIDS in and around Aligarh. *J Indian Acad Clin Med* 2003;4(2):121–6.
8. L A Valleroy, D MacKellar, S Behel et al. The bridge for HIV transmission to women from 15 to 29 years old men who have sex with men in 7 US cities. XV International AIDS conference Bangkok, Thailand (Abstract). July 11-16, 2004. Available at: www.iasociety.org/Abstracts/A2171571.aspx. Accessed on July 15th, 2007.
9. B. Unnikrishnan, et al., Vinita Jagannath, John T. Ramapuram, B. Achappa, and D. Madi : Study of Depression and Its Associated Factors among Women Living with HIV/AIDS in Coastal South India, International Scholarly Research Network ISRN AIDS Volume 2012, Article ID 684972, 4 pages.
10. Preeti Rai, Babu L Verma: A study on depression in people living with HIV/AIDS in South-West part of Uttar Pradesh, India, *South East Asia Journal Of Public Health* ISSN: 2220-9476 ISSN: 2313-531X (Online)
11. M.S. Bhatia, Sahil Munjal: Prevalence of Depression in People Living with HIV/AIDS Undergoing ART and Factors Associated with it, *Journal of Clinical and Diagnostic Research*. 2014 Oct, Vol-8(10): WC01-WC04
12. Haftu Berhe and Alemayehu Bayray: Prevalence of depression and associated factors among people living with hiv/aids in Tigray, North Ethiopia: a cross sectional hospital based study, Berhe and Bayray, *IJPSR*, 2013; Vol. 4(2): 765-775, ISSN: 0975-8232

13. Adetunji Obadeji, Adegboyega O. Ogunlesi, Timothy O. Adebowale, 2014: Prevalence and Predictors of Depression in People living with HIV/AIDS Attending an Outpatient Clinic in Nigeria, *Iran Psychiatry Behave Sci* 2014; 8(1): 26-31.
14. Dixon Chibanda, et. al., 2016: Prevalence and correlates of probable common mental disorders in a population with high prevalence of HIV in Zimbabwe, *BMC Psychiatry* (2016) 16:55.
15. Ndu A. C., Arinze-Onyia S. U., Aguwa E. N.1 and Obi I. E.: Prevalence of depression and role of support groups in its management: A study of adult HIV/AIDS patients attending HIV/AIDS Clinic in a tertiary health facility in South-eastern Nigeria, *Journal of Public Health and Epidemiology* Vol. 3(4), pp. 182-186, April 2011
16. Smarajit Jana, Protim Ray, Soma Roy, Joel Piduttia, Toorjo Ghose and Samaita Jana, 2017: Depression and Its Relation with HIV Risk and Social Well-Being among the Brothel-Based Female Sex Workers in Kolkata, India, *J Community Med Public Health Care* 2017, 4: 025.
17. Namita Navnit Deshmukh, Avinash M Borkar, Jyotsna S. Deshmukh 2017: Depression and its associated factors among people living with HIV/AIDS: can it affect their quality of life: year 2017, Volume:6, Issue:3, Page: 549-553.